

A Future Uncertain
The Path to a Post-Market
Economy

by

Gregg David

Copyright © 2015 by Gregg David

All Rights Reserved,
including the right of reproduction
in whole or in part in any form.

ISBN-13: 978-1517161361

ISBN-10: 1517161363

Contents

Introduction.....	6
Part One: The Reasons to Change	9
1.1 The Market and Spontaneous Order.....	14
1.2 The Engine of Economics	46
1.3 The Culture of Consumption	78
1.4 An Unsound Foundation	104
1.5 The War of Technology and Labour	142
1.6 The Path Towards Oligopoly	173
1.7 Fusion	207
1.8 Inequality	255
1.9 The Ecology of Humanity.....	301
1.10 Overshoot I - Ecological Decline	339
1.11 Overshoot II - Depletion	380
1.12 The Misaligned Cost Constraint	396
1.13 The Exponential Growth Fallacy	422
1.14 Conclusions: The Ramifications of Inaction	448
Part Two: Direction.....	458
2.1 The Path to a Post Market Age.....	461
2.2 The Human Nature Argument	478
2.3 Incentive	514
2.4 A Racial Worldview	540
2.5 The Inertia of Religiosity	566
Part Three: The Blueprints	584
3.1 Post Market Economics	586

3.2	Technological Development	600
3.3	Societal Development.....	638
3.4	Transition	679
3.4.1	Scenario One: The Testbed Society.....	680
3.4.2	Scenario Two: The Top Down	687
3.4.3	Scenario Three: The Bottom Up.....	693
3.5	Final Conclusions, Activism and Support	699

Introduction

THE IDEA OF A NEW WORLD is not a recent development. One has to look back over two millennia to Plato's *Republic* to see the beginnings of alternative social imaginings. Yet for all the gusto that politics may muster about our wonderful modern world, very little has systemically changed since Plato's day. A visitor from past millennia may be awestruck by our skyscrapers and touch-screen smartphones, but would feel completely at home exchanging their hard earned gold for products and services. They may be terrified by the precision with which laser guided smart bombs and nuclear warheads deliver devastation, but the reasons why they would need to be used would not seem so alien. Modern day starvation, poverty and crime would be on an unfamiliar scale, but the concepts themselves would feel refreshingly familiar. Our advantages may have evolved over the years, but our problems seem to remain the same as they have always been.

So why is it that our societal progress lags behind our technological innovation? We have split the atom, but never really cracked crime. We have sent people to the moon but still cannot adequately feed those on Earth. At the pinnacle of our knowledge of science and the world around us, it seems that humanity's shortcomings endure unmolested.

Within the rabble of political and economic discourse, booming voices may be heard dismissing such societal ills to our own self serving human nature, and they are often well founded in backing up this claim. It is refreshingly easy to open the newspaper and find innumerable disgusting atrocities committed across the globe to supplement this belief. Casting our gaze further back, civilised human history the world over has been defined by countless wars, conquests and bloodshed as far back as time cares to remember. It is only natural to make the assumption that 'this is the way of things' and dismiss such problems as intractable. After all, our humanity has been just about the only constant underpinning our vast history of crime, violence and self interest.

Yet other underpinnings, entangled with the common understanding of our nature lie oft undiscussed in this quandary. Of all societal properties, trade and monetary exchange are perhaps the most axiomatic within modern economies and nations. The rules and methods have changed and evolved in complexity

Introduction

over the millennia; the feathers and seashells have morphed into gold, silver and copper, and into paper and digital currencies, but the powerful influence of these phenomena has remained the driving force behind our development as a species.

In contrast to our own nature, the concepts behind these basal protocols have become seemingly impervious to criticism, and riddled with taboo and ideology. The communists and capitalists argue within a blinkered theatre, squabbling over which group of people is best suited to control these ancient mechanisms, but never turning such rigorous discourse upon the lumbering mechanisms themselves.

When aspects of our society begin to go awry, it is seldom our overarching concept of economics which is interrogated as the possible culprit. Modern global political systems instead habitually pass the buck between governing parties, nations, races and religions over the issues which stifle economics and trade.

The 2008 global financial crisis emphasised the true nature of these problems on a hitherto unprecedented scale. For many, this event acted as a rude awakening from the ethereal 16 year dream of consistent economic growth which preceded it. But this event was not the first of its kind, and nor was it completely unforeseeable, seemingly for anybody aside from the initiated economists.

The book you hold in your hand is therefore an attempt to promote thinking beyond the stunted and weather-beaten concepts of modern economic theory, and to reflect upon different ideas and social mechanisms in a pragmatic and meaningful manner. Many of the arguments presented in this body of work are not new, and in some cases are common knowledge within the scientific community. However it is often the case that application of these concepts remains limited within the wider social structure, due in part to the ideological entanglements of our socioeconomic doctrines.

The book is set out in a basic three part thought process. In part one, I present the issues and problems which face humankind as of today, and reflect upon the ability of traditional market economics to solve them. Part two details the core values, baselines and concepts behind a hypothetical post-market economy, as well as addressing the common arguments against such a road map from the established political and economic literature. Part three presents a theoretical representation of what this society might look like, how it would function, what problems it may have, and potential routes out of our current economy into this proposed system.

Introduction

In all of this analysis and discussion, we must continually be mindful of ideological arguments which we will confront when broaching these contentious topics. Many individuals hold very strong emotive feelings towards market based trade and economics, in many cases due to their own personalities or life experiences. In dealing with these concerns, dispassion, empathy and realistic discussion must always take precedence, as it is in everyone's best interest that the ideas presented here are as factually accurate and robust as possible. As such, I have taken specific care to highlight unknowns, or potential problems when outlining the arguments in this book. I do this in order to take the most pragmatic and rational stance possible, in the hope that ideological biases are left by the wayside by both parties when debating these ideas.

Chronocentric perceptions that our generation stands at the precipice of an unparalleled collapse must also be treated with caution. During part one of the book, I deal with the potential threats to our civilisation not in order to scaremonger support for change, but rather to create a realistic picture of our position in the great scheme of things. Indeed, I remain confident that if climate change, resource depletion and accelerating population growth all magically disappeared tomorrow, there would still remain ample arguments to prompt for a new socioeconomic model, simply from a standpoint of human values.

Nevertheless, I do argue that given the evidence, the human race is indeed approaching a crossroads of sorts. I will argue that we must change our ways in order to weather this oncoming storm, but that we must also choose in which direction we shall proceed. The path straight ahead of us may be the most welcoming and familiar, but it is one that leads to high risk and potential calamity.

I concede that it is easy to become discouraged by the sheer magnitude of our current quandary, but conversely it also represents a very exciting time to be alive. Real, sweeping change is guaranteed within the century, if not within our lifetimes. It is solely down to us to determine whether this change is positive or otherwise. I invite you to explore the ideas that I present with an open mind, but also with a strong sense of scepticism. Research, discuss and critique the concepts and arguments that I summarise, and above all enjoy the journey through our uncertain future.

Part One: The Reasons to Change

IT IS THE HOPE that the readership of this book is not solely made up of those who already agree on the subject matter, and its conclusions. It would be refreshing and exhilarating at this point to be a reader who is genuinely curious and proceeding with questions burning on their lips. I gather that the number one question for such a reader would chime something like: "*...but what is actually wrong with a monetary market system of trade?*".

This is indeed a very valid question, as the system in which we live is seldom scrutinised to such a degree. Arguments regarding specific philosophies within such a system may be ubiquitous, but rarely does mainstream discussion focus upon the framework itself. Modern money is trusted. It is generally assumed to be an impartial and accurate representation of the way reality functions. Sure, the path to a larger, more prosperous economy may have its bumps in the road along the way, but such is to be expected in the competitive marketplace.

The fact that these views are almost unanimously held within society is actually deeply worrying. More worrying still is the fact that it is a worldview which is not limited to the average lay man in the street; it is one which extends deep into politics, business and even professional economics. It is almost unthinkable to imagine that the majority of mainstream economists are unable to deduce the most basic and general observations relating to their body of knowledge, yet as we will see later in this section, that is exactly the situation we find ourselves in.

Modern economically driven politics has been reduced to a theatre of disillusionment, as parties frantically craft sprawling spending plans as the core of their manifestos. Despite this economic meticulousness, neither left nor right ever manages to achieve or deliver a consistent and long-lasting prosperity. Thus, the typical election campaign moves away from creative policy making for the genuine betterment of society, and becomes an extended peer review of budget proposals between parties; dissecting and analysing proposals down to the last Pound, Dollar or Euro. How did the Western world – with its incredibly highly developed infrastructure and economy – become so destitute that every penny must be placed so carefully?

The root of this lies in how money is trusted. But is this unconditional trust really justified?

The Task

Justification for the market economic system is therefore the topic of this first part of the book. Unsurprisingly, beginning such an audacious analysis presents a series of issues. Firstly, modern society is an unfathomably complex creation, with a staggering number of factors which can pollute or blur analysis. Religious viewpoints, cultural and racial differences, patriotism, nationalism and economic school of thought all play a part in making the path forward less obvious.

Secondly, sound analysis of what is best for people can easily be misconstrued as politically fuelled propaganda, or vice versa. History is rich with examples of smooth talking ideologues selling their political snake oil under the banner of rationality.

In order to sidestep this quagmire, the aim of this section must therefore be necessarily straightforward. The question which this section poses, and subsequently attempts to answer is as follows:

“Is the current social system the most beneficial model for humanity?”

While society is a complex creation, it is entirely within our ability to present a reasonably confident answer to this simple question. If the answer is no, then a better alternative must be considered; it is as simple as that.

A Civilisation Divided

In order to fully set the limits of this analysis, we must first set parameters which can be empirically evaluated in relation to our current market paradigm. While society is inexorably interlinked through almost every conceivable facet, it does seem rational here to break the task down into more discrete chunks. The level of decomposition which has been used is shown in Figure 1-1.

What Figure 1-1 shows is a breakdown of our civilisation into four pillars, if you wish. Each of these pillars represents an aspect of human civilisation which plays a pivotal role in our world today. While more decomposition into more specific aspects of society is certainly possible, brevity dictates that this is difficult without producing a rambling book which would be the bane of readers' forearms.

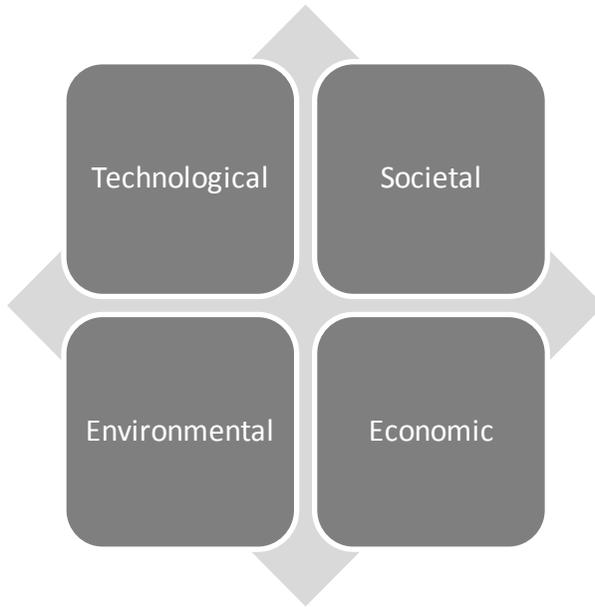


Figure 1-1: Analytical division of civilisation

Figure 1-1 represents a good balance between the specific and holistic viewpoints which are simultaneously required to get a good grasp of our social system. I concede that it will often be difficult to discretely analyse these components in total isolation from one another, but chapters within this section are divided and arranged with this generally in mind.

So what do these divisions actually represent, and what kinds of methods will be used to determine whether they are benefited by the monetary market system? In essence, the economic pillar revolves around the definitive mechanics of money, banking and financial services, as well as the basic concepts of markets. Analysis of this area looks primarily at the internal functionality and robustness of the economic paradigm, and how feasible it is that this system will endure into the future in a similar form.

The environmental subdivision represents global ecology, wildlife and biodiversity, as well as availability of useful resources. Critical analysis here should be targeted at how our market based social system links in with each of these environmental attributes, and how sustainable and positive our relationship with the environment is. The environmental component is of particular

importance, as it represents our anchor to reality, and ultimately has somewhat more sway in discussion of our future civilisation than the other categories here.

The third category considered is the technological aspect of our civilisation; an understandably broad subject to discuss when considering how far technology has brought us. This category represents our effective usage of technology and our innovation in the field of science, including how technology relates to and improves our everyday lives through industrial production, transport and entertainment. In examining this, we must scrutinise how effective our science, knowledge and technology has been applied for social betterment, and how compatible our social system is with efficient exploitation of emerging technologies for common good.

The final, and by far the deepest category to be covered here is the societal aspect of our system. This encompasses everything to do with society; our culture and art, our personal health, our relationships with others, the social hierarchy, general human wellbeing, etc. The purpose of this analysis is to assess our personal and collective prosperity in the context of the market system, i.e. do we benefit from it and if so, how? It is imperative that these variables are assessed distinctly separate to the economic sphere, in order to avoid the common oversimplification that economic growth automatically and inevitably leads to communal prosperity.

It is hoped that consensual agreement can be reached with the reader on this as a suitable breakdown to move forward with, as I found it difficult to pinpoint any job, industry or activity in society which cannot be pigeonholed into one or more of these four categories. As such, I feel that this represents a fair categorisation of the socioeconomic system to progress through this section with. While it is not a mainstream view to analytically question such axioms of our society in detail, I implore you to digest the information presented in this section and come to your own conclusion regarding our current global paradigm.

1.1 The Market and Spontaneous Order

AS THE UNIVERSE COOLED and vast masses of elements began to coalesce into the forms we know today, a great process of incredibly precise design was set in motion. This process seemingly developed without the presence of any known designer, and yet yielded results as complex and efficient as any meticulously planned construct since created. As iron and rock were brought together by gravity to form what would be named Earth some billions of years later, the natural grace of emergent spontaneity was the only governing rule.

Yet under this simple rule, time witnessed our planet form into a near perfect sphere. It saw denser iron sink to the core, while more buoyant rock became the surface we walk on today. When chaotic spontaneity thrust the protoplanet Theia towards the young Earth, time again stoically watched as the impact remnants fused into a second, smaller sphere which would one day be referred to as the moon.

Molecules would chaotically bond together over countless millions of years in ever increasing complexities, driven by the abundant nuclear energy from a spontaneously burning ball of gas over a hundred million miles away. Amino acids, DNA and proteins would rise from this primordial chaos, becoming the building blocks for chemical constructs ever more audacious and numerous.

Through the random and spontaneous process of evolution by natural selection, these constructs became ever more adept and honed to their environment for the sake of their own survival. Some absorbed energy directly from the burning ball to synthesise food; some developed claws to kill prey more effectively; others camouflaged themselves to hide from view of predators. Some later iterations developed intricate appendages to grip and use the environment to their advantage.

Through chaotic and varied spontaneity, these forms of life began to learn about their surroundings, soon finding their niche in intelligence and curiosity. The versatile grip and agile mind complimented each other beautifully, allowing

environmental interaction and behaviour based on reasoned prior knowledge, rather than solely instinct.

In time, the latest permutation of these creatures would come to a great dominance upon the planet now named Earth. They would reconfigure the environment beyond all recognition using their large brains and versatile grips. They would reach a level of civilisation and knowledge far beyond that of all other species on the planet.

Yet this species would be one with amnesia. They would gasp in wonder at the natural aspects of the world around them, yet none would know how it came to be. Many would turn to some grand inventor who forged the greater world in the same way that they had forged theirs. The watchmaker like precision of a near perfectly spherical habitat, cycling through regular periods of light and darkness simply begged to be attributed to a designer.

But many would grow weary with this concept, and instead turn to the tool that earned them this seemingly insurmountable niche; their large brain. These beings began to ask the pivotal questions around the mystery of their own existence. They began to look backward at all that preceded them.

Some philosophised upon their own meaning or purpose. Others gazed skywards at the intricacy of the cosmos. Some unearthed the ancient remains of those who had come before, while others examined their relationship with the myriad other creatures with which they shared the planet. They wondered at the vast precedent timelines of emergent spontaneity which sired them and their kind.

Zhuangzi, Copernicus, Galilei, Wallace, Darwin; the names of these visionaries are well known to all of us, and they still stand among us today in the form of their massive contributions. Yet more majestic than these individuals and the distinct deductions which they made is the greater engine upon which all of this is based, and which they helped to unearth. The emergent and spontaneous order of the universe; the ancient struggle which fathered everything we comprehend in a never ending progression of cumulative self directed action.

As society became increasingly complex over the course of its development, great thinkers naturally theorised organisational approaches to ensure that prosperity and stability was maintained and furthered. Socialism, anarchism, capitalism, communism, feudalism, fascism; the list is nearly endless, with all proposed systems possessing vast tomes of literature and critique.

Yet it was economist Friedrich Hayek in his book *The Fatal Conceit* who so eloquently aligned his particular favoured structure to the majesty of spontaneous order. He stated that his favoured economic system of capitalism represented an extension of the natural order “...into which we fit ourselves by obeying certain rules of conduct that we never made, and which we have never understood...”^[1]

It is indeed a powerful and moving argument, and one which is not without realism. Naturally, this superior system of economics was the one which rose to global prominence and has been unperturbed and unchallenged in its domination ever since. The large scale collapse of communism was a testament to how humanity should not trifle with the natural dynamics of the universe, and henceforth we have heeded the universe’s call.

Markets became progressively less regulated and left to their own devices by an increasingly microscopic and passive government. Competitive free trade was vehemently encouraged at all levels in order to create the most natural and efficient world from the cumulative spontaneous actions of the population. Any approach or ideal which was not aligned with this axis of thought was labelled as anathema to freedom, and became viewed as a barrier to pure and natural spontaneous efficiency. Thus the 'free market' was born.

Where Does The Freedom End?

In the year 1800, a young Welshman by the name of Robert Owen becomes overseer of a cotton mill on the banks of the Clyde. Little of the establishment is out of the ordinary; the machinery and working conditions are fairly typical of the age. But the fresh faced new owner becomes increasingly disturbed by the harsh conditions under which employees were required to work, and the squalor which their families lived in. Owen saw this maltreatment as the root cause of the ignorance, crime and alcohol abuse within the surrounding community of New Lanark. He attributed this perception to an intrinsic conflict of interest; the needs of the society opposed to the profit mechanism of capitalism^[2].

It may come as no surprise to many that Owen was a socialist. His contributions to this school of political thought are widely known. But in the absence of political and socio-economic ideology, it remains difficult not to see at least a degree of wisdom in Owen’s observations. To improve the living conditions of workers through better pay, more equitable treatment and secure housing makes a great deal of sense from a moral standpoint, but from an entirely fiscal stance the well being of the workers is inconsequential so long as work is done. To Owen, the wellbeing of the workers was anything but inconsequential, as to him

the moralistic voice in his head could not simply be drowned out by the sound of soaring profit.

Owen's subsequent reform of the nondescript New Lanark Mill transformed it into an entity which soon garnered nationwide attention. Housing and factory conditions became more than adequate for family habitation, and goods were sold in the village shop at fair prices - an uncommon liberty given the truck systems which dominated industrial communities at the time. New Lanark became the setting for Britain's first primary school in 1812, a feature which helped to set it apart on the European stage as a model industrial community. Yet the success of Owen in improving the standards of work for those in industrial employ did not end with the metamorphosis of the humble cotton mill on the banks of the Clyde.

In 1815, Sir Robert Peel (father of the future Prime Minister) led an unsuccessful attempt to bring in a piece of legislation to ban children under the age of ten from employment. Robert Owen was a fervent supporter. Peel and Owen continued to campaign both inside and outside Parliament in support of this legislation, but were beaten back by the Lords. "*Labour ought to be free*" they would proclaim in chorus^{[3][4]}.

This was not an implication that these children should be legally enslaved, but that the market by which labour is governed should be free to employ whoever it wished. If children could work, there should be no law to prevent them, regardless of subjective moral standpoints. Despite the resistance, the Cotton Mills and Factories Act was eventually passed in 1819, requiring that no youth under the age of nine was permitted to be employed in cotton mills, and with a maximum working day of 16 hours for all teenage employees^[5].

It would be difficult for a free market economist today to argue that the ideals which Peel and Owen fought for over two centuries ago were the embodiment of invasive government into market territory. But at what specific point does the regulation of the free market become a hindrance to the natural and inherent spontaneity of the system? From an objective standpoint, there is no such distinct line to be drawn here.

The plight of Peel and Owen was exactly that; a government truncating the freedom of the market in order to protect the vulnerable. It was no less of an act of government encroachment than a welfare state to protect those made vulnerable by job cuts, or a health service to protect the impoverished ill.

All of the above are statist encroachments into the wider market, yet only a subset of these protections are viewed as damaging to liberty and emergent spontaneity. Other, more obvious protections, such as child labour law, lie largely unnoticed by free-market rhetoric. As renowned economist Ha-Joon Chang states, “*How ‘free’ a market is cannot be objectively defined. It is a political definition.*”^[4]

Understandably child labour is an emotive topic which represents the extremes of market freedom, but it is none the less a valid commentary on the subjectivity of market freedom. In a totally free market, there is no intrinsic deterrence to such actions, other than feelings of moral or altruistic duty; the very ideals which drove Peel and Owen.

The Invisible Puppet Strings

More will be revealed later in the chapter regarding the conflict of interest between the ‘hard’ incentive of profit and the ‘soft’ incentive of social responsibility. But first it seems prudent to illustrate the extent to which our seemingly spontaneous free market system is constantly reined in by vast bodies of governmental and legal legislation.

In 1995, collaboration between American think tank The Heritage Foundation and the Wall Street Journal culminated in the creation of a measurement standard which became known as the Index of Economic Freedom^[6]. The intention of the index was to peruse a wide range of available statistics from the World Bank and other international financial bodies, in order to objectively assess the level of market freedom which was enjoyed within a particular nation.

This enables a useful inference, as from these rankings we are able to ascertain exactly how ‘free’ a modern free market is, or indeed, how free proponents believe it should be. As of time of writing, the Chinese Special Administrative Region (SAR) of Hong Kong topped the world rankings, with an economic freedom index of 89.7^[7].

This result far outperformed the de facto leader of economic freedom that is the USA, which currently sits in 9th place with an index of 77.8^[7]. So if Hong Kong represents the model towards which other free market economies strive, exactly how free is it? Assuming that Hayek’s spontaneous order argument is correct, we would expect to see a minimal encroachment of regulatory legislation into the naturally self-regulating market.

In actuality this is not what we see. The business regulations within the SAR of Hong Kong are incredibly in depth, with extensive legislation relating to every aspect of employment, industrial undertakings, imports and exports, banking, credit, company procedures and so on so forth^{[8][9]}. While the Hong Kong market may be the freest in the world, it is a stretch to say that it is even close to being *free*.

Economist Ha Joon Chang has summarised this circumstance beautifully, using the analogy that the free market is akin to a puppet, suspended and operated by an assortment of near invisible wires^[4]. Through the goggles of cultural conditioning, many of us have become ignorant of the existence of the wires upon which the elegant puppet is so very dependent.

This invisibility of the puppet strings is perhaps because so many of the meticulously engineered laws and regulations are obvious to the vast majority of rational humans. Exploitation of individuals is wrong, and the law should therefore obviously act to protect them. End of story. However, the crux here is that these stances are only obvious from a *moral* standpoint, not an economic one. The mere existence of such unambiguous, air-tight regulations surrounding mundane variables, such as the amount of time an employee is entitled to for lunch, stands as a testament to the existence of an opposed incentive to abuse this entitlement.

Economic motives have remained largely unchanged since the days of Owen and Peel's fight against child labour. It is only a sense of morals which discourages such actions today, and as we will see later in the chapter, sometimes our moral code is simply not strong enough to outweigh economic incentives.

Hayek's argument has therefore drifted into choppy waters. It seems apparent that the freest economy in the world today has considerably less freedom than Britain during the times of the industrial revolution and Robert Owen's campaigning.

All of this leads us to a quandary; if a market seems to require some degree of regulation in order to partially subdue exploitative properties, then what is it we are trying to preserve? Are we battling against natural spontaneity in order to maintain an unnatural existence, or is it in our nature to collectivise socially and limit self direction?

Upon this realisation, we see that an argument aligning the market system with some immutable natural law of spontaneous order is a gross oversimplification. It is clear that the spontaneity of the market does not lead to the kind of order that Hayek may have hoped of.

Defining the Market Incentive

With a view of the flaws within an argument from nature, we may continue to assess the market system based upon its own merit within society. Before continuing our study, it is prudent to properly pin down exactly what is being assessed. It was the renowned Adam Smith in his flagship work, *The Wealth of Nations*, who proposed the power and simplicity of the motive of self interest as a viable means of ordering human affairs.

"It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow citizens." [10]

It is this which cements the professed genius of the free market system; harnessing the useful and productive side of our most self-serving desires. Ultimately, this self interest would become the mechanism of Hayek's spontaneity, around which societal order would supposedly coalesce. Yet there is a great deal of oversimplification here, as portraying people as simplistic and selfish neglects a great deal of alternative aspects of motivation.

Granted, self interest is an important motive, but it does not mean that a person will ignore nationalism, respect, dedication, passion, habit, or any other motive. Regardless, it is from the humble seed of self interest that the marketplace owes its existence to; it is the simple, primal urge of self interest which drives Hayek's spontaneous extension of the natural order forward.

We must also tread carefully during this discussion, as the free market is frequently defended by a minefield of dogma. Granted, it is unsurprising that the word 'freedom' is one which naturally attracts positive connotations. Freedom and liberty are after all the pillars of modern Western society. It is therefore a recurring criticism of those opposed to the free market they are opposed to freedom itself.

The parallel is easy to subliminally draw, given the close relationship which the free market has come to hold with words like 'democracy' and 'liberty'. However it is not personal freedom which we are dealing with here at all; rather it is the freedom of the market and the market incentive mechanism.

While personal and market freedom (in the modern, heavily regulated sense of the word) can and do coexist quite happily in many cases, one does not necessarily hold the monopoly of the other. Once again, we are reviewing the incentive structure on its own merits, rather than whatever social edifice it supports.

So what exactly is a market incentive, and how does it manifest in human behaviour? Firstly, unravelling the market incentive may prove easier by viewing the economy from the perspective of a mixed motive game. This in essence means that the operation of actors (individuals, businesses or groups of businesses) within the game (economy) is governed by a variety of motives, dependent upon the perceived costs and benefits of said motives for the actors.

Self interest in itself is but one part of the puzzle here, as cooperation within the mixed motive market is commonplace between businesses and within business hierarchies. A basic game theory model, which in part set out the path for the now sprawling field of behavioural economics, allows us to identify three broad behaviour patterns which underpin human tendencies in mixed motive scenarios*.

These are as follows: The individualist seeks to maximise *absolute* value, and cares little about how much value others gain. The competitor seeks to maximise *relative* value and is often highly concerned by the performance of others in relation to themselves. Finally, the co-operator seeks to maximise *shared* value, caring little about relative wealth so long as all players involved gain the most combined absolute wealth possible.

This spectrum of tendencies is by no means comprehensive, but offers a good outline of the behavioural trends of individuals and groups participating in mixed motive games. We will return to game theory in much greater detail during the second part of the book, but for now we may safely assume that the broad fields set out apply roughly to individuals and businesses operating within the mixed motive marketplace.

* *A more in depth look at game theory is included in chapter 2.2.*

Based upon the behaviour definitions alone, it becomes very easy to conjure images of companies who fit the bill of each tendency. The co-operator is perhaps most obvious, as a business which is a proponent of this motive will often label themselves as a cooperative rather than a corporation.

The Cooperative Group in the UK is an apt (if unimaginatively named) illustration of this motive in action. The company sacrifices absolute and relative financial gain in order to invest in scrupulously ethical trading and profit sharing schemes, thus maximising shared wealth.

The competitor is easily found locked within the vice of a duopoly, or any other tense and unpredictable marketplace. Boeing and Airbus represent good examples here, where absolute value invariably plays second fiddle to the relative value between the two giants.

Individualism is a far more ubiquitous behavioural aspect, and underpins the vast majority of businesses and individuals. These actors within the marketplace are eager to perform the best that they can, but care little about the ramifications of their actions or the actions of others.

It is from the combination of these three attributes that the modern marketplace arises, but there is more to consider here within the motives that affect the economy. Consider the competitive and cooperative modes of value accumulation. These methods of value accumulation differ from individualism as they draw from distinctly different human traits. The co-operator draws upon a sense of fairness, while the competitor draws from one-upmanship. The unusual effect of this is that absolute value accumulation becomes secondary to ulterior motives.

What is also of importance here is that combinational approaches may also be utilised within mixed motive games. While it is obviously not possible to be a collaborative competitor, it is quite possible for people to hold views which are half way between individualism and cooperation or competition, that is; valuing the ideal of cooperation or competition so long as individual gain is safeguarded.

The difficulty comes in integrating cooperation into the equation, as while cooperatives and democratic business models do exist within the modern marketplace, it is a stretch to state that they define it. In order to fill in this blank, we must unwind the root of market commerce and trade to examine what motives lie behind the actions of cooperative businesses.

Cooperative market actors find themselves in somewhat of a quandary when entering into the realm of trade, as it becomes apparent that compromise is the name of the game. In a marketplace, it is mandatory to seek individualistic gain to some extent, as without gain, trade is pointless. A cooperative actor must balance the desire for shared gain with individual gain in order to make the trade sufficiently lucrative for themselves while also remaining consistent with the ideal of egalitarianism.

As such, while the effectiveness of a co-operator relies on balancing shared value with individual gain, the market competition selects solely on the basis of individual, absolute value. Competitors find it much easier to reconcile a desire for relative gain with a need for absolute gain, as the two prerogatives operate at the individual level and are less likely to conflict with one another. Individualists, of course, fit this system like a glove.

This is largely in line with the imitated or *pseudo*-evolutionary nature of the market system. Economic literature borrows extensively from the field of evolutionary biology, espousing the maxim of 'survival of the fittest'. Evolution is staunchly individualistic, and while cooperative creatures may succeed, they only do so based upon the individual component of their shared value they accrue.

The real world reflects this portrait nicely, as perusing the FTSE100, Dow Jones or any comprehensive list of successful businesses yields a very small number of cooperatively geared companies. Faced with this fact, it seems that cooperative actors may be able to exist and prosper within market economies, and markets require a level cooperation to function, but it is a push to say that cooperation is in any way a defining trait of the incentive which drives the machine. Absolute value maximisation is clearly the only game in town.

So, before we coin a phrase to attempt to sum up what the market incentive actually is, we must first take some baby steps toward defining what kind of value we are talking about. In order to explore this complicated idea, we will create an example.

Let us imagine a tobacco company; a fabulously lucrative trade which has made many people into billionaires. Tobacco companies make money (value) by selling items which cause harm to anyone who uses them. This harm has a monetary set of ramifications, as the degraded health, if severe, must be treated in hospitals, which require money to run, either from the taxpayer or the patient.

Now, from a global stance, it appears that value is not really maximised here, as the value created in the sale of the cigarettes is offset by the value expended in treating the side effects of the customers. However, the tobacco company does not pay for this expenditure. While this is an obvious point, it allows to illustrate what variety of absolute value is enshrined in a market system – individual value.

As we have covered, cooperatively oriented businesses may attempt to redress this balance by chasing shared value, but they are ultimately dependent upon the individual value which they accrue for survival. However, merely stating individual value as the aim of the market incentive is an incomplete picture, and one which requires an additional illustration to present.

The global economy thrives on production and sale of goods, as we will see in coming chapters. While this may represent a great deal of instantaneous value for the traders in question, the long term relevance of this value is questionable. As we shall see in chapter 1.11, depletion of resources to fuel this value swapping game is a genuine concern on the horizon.

While the value of goods and their uses to consumers in the present is undeniable, the offset of this value by upcoming resource scarcity is not something that the market is able to foresee with any great accuracy. As such, the market's idea of value is generally short term, extending to medium term if we are feeling generous.

Thus, a defining statement for us to burn into our retinas may be constructed from this sweeping overview. If you feel that this synopsis of the market incentive is in any way inaccurate or incomplete, then please feel free to invent your own, and continue through the chapters with that in mind instead. However, from my own judgement, I feel the following blurb encapsulates everything that is mandatory in describing the incentive which drives our world:

“A self directed, pseudo-evolutionary prerogative to acquire maximum absolute individual value in the short to medium term.”

In light of this clunky statement, and with a fairly clear view of what the market incentive actually is, we may continue to assess exactly how this seemingly invisible force guides us forward.

Rest assured that this is not solely a ubiquitous diatribe against capitalism, offering conversion to an alternative system of organisation as a more viable

alternative. The presence of a market incentive is a large part of a great many socialist economic frameworks also.

At this point of the book, we must not beleaguer ourselves with proposing alternatives without gathering a comprehensive picture of the problem at hand. We need only concern ourselves with the method of order, by way of the incentive system.

Opening the Gates to Market Freedom

There are few terms within British culture which are dreaded and derided as much as ‘health and safety’. The explosion of red tape and risk assessments surrounding all manners of things is widely documented, and widely detested. However, it may be surprising that the forces nurturing the new health and safety conscious world are imperative to understanding markets and their incentive systems. We must look at health and safety not as a maddening quirk that appeared out of the blue, but instead as a defence mechanism against market encroachment into a domain which was free from its influence until relatively recently.

We are all familiar with the so called ‘compensation culture’ brought about by ‘no win – no fee’ legal firms, and the dreadful television advertisements which accompany them, but it is seldom that the link is discussed between these firms and the red tape nightmare of modern health and safety.

In reality it is quite clear that the two factors are rather important to one another. The no win, no fee claim was introduced by the UK government in 1999, to both ease the burden on the treasury and to allow ‘access to justice’ for those less endowed^[11]. The intention seemed sensible and noble, but instead the result was a cohort of personal injury firms sprouting up overnight to take advantage of this newly formed and highly marketable niche.

With names like ‘Injury Lawyers 4 U’ and ‘Claims4Free’ it became clear that this aspect of the law industry was aimed at society’s most vulnerable and uneducated, encouraging them to ‘have a go’ at making some money off the most sedate of incidents.

The result of this is that the legal channels became saturated with petty litigation over claims which would have not come to court otherwise. Ultimately, it is the institutions and employers who must foot the bill for even the most insignificant of oversights which could be exploited as a claim. It is then obvious to assume

that in response to this, the working world would set up safeguards to ensure that they err on the side of caution, sometimes excessively.

In 2010, Lord Young of the UK's Health and Safety Executive issued a report on request of the Prime Minister. Within this report he included an entire chapter dedicated to addressing the culture created by over-zealous law firms. What is said sums up so beautifully what has been discussed here.

"In 2006 the House of Commons Constitutional Affairs Committee's report into the compensation culture concluded that people perceive Britain to be a far more litigious society than it was 10 or 20 years ago. This culture creates a climate of fear and encourages organisations to attempt to eliminate all risk, even though this is an unattainable goal. Furthermore, a blame culture has developed in which, rather than accepting that accidents can and do happen, somebody must always be at fault and financial recompense is seen to make good any injury. While there is of course a need for those injured as a result of negligence to receive adequate damages, the legal process must be proportionate and not unduly costly.

Britain's 'compensation culture' is fuelled by media stories about individuals receiving large compensation payouts for personal injury claims and by constant adverts in the media offering people non-refundable inducements and the promise of a handsome settlement if they claim. It places an unnecessary strain on businesses of all sizes, who fear litigation and are subjected to increasingly expensive insurance premiums."^[12]

The illustrative example of the compensation culture and its related red tape explosion is a poignant example of where greater freedom of market incentives lead to detrimental outcomes. The incentives at work here are not alien to us; yet it is these incentives which often require reams of regulations to rein in (in this case – comprehensive employment protocols to attempt to eliminate legal risk).

Unfortunately, it cannot be said that this is a rare occurrence in practise. Increased freedom of the market incentive has led to intense legislation and regulation in almost all fields of trade, and even fields where trade is illegal. Members of governments must by law disclose all gifts which are offered to them in order to defend against parliamentary decisions being bought or influenced. In the UK alone we are inundated with regulatory bodies and ombudsmen to keep the consumer safe from unscrupulous traders.

Authorities for food, transport, advertising, general consumer goods, financial services and so forth are common knowledge amongst the public, yet their presence is not viewed as a problem with the underlying dynamics of the system. Instead the issue is viewed as defence against the action of a minority of 'bad apples' who are abusing an otherwise placid and agreeable way of conducting ourselves.

BBC television programmes such as *Rogue Traders* or *Watchdog* show us the antagonists of this drama being publicly degraded and receiving their comeuppance, much to the joy of the public. We watch as these people are embarrassed and humiliated, on national television, giving us the comforting feeling that justice has been served and the marketplace may return to normal.

But what is rarely discussed here is that what these 'rogues' are doing is entirely justified and understandable economically; it is only from a moral stance that we can categorise what they are doing as wrong or unjust. It is the market which creates the rogues and the market that rewards them as they go about their unscrupulous trading.

Of course, a typical rejoinder to this line of reasoning has been prepared in advance within the tomes of market economics. Such a rejoinder generally argues that the 'bad apples' are in fact not rewarded, as their poor reputation within the marketplace soon precludes any further business; but is this actually true?

Bounded Rationality and Opportunity

Is the market really a domain which automatically addresses unscrupulous actors, rendering their products (or services) unattractive to the consumer? Can the market be viewed as a spontaneously self governing domain, which roots out rogues?

Proponents argue that Adam Smith's invisible hand of the market* will iron out such unwanted activity, as the fear that your competitor can snap up your disillusioned customers will keep you in line. You will therefore offer the best products at the lowest possible prices, because if you do not, business will go elsewhere.

* *While Adam Smith spoke of the invisible hand both with regard to a selfish landlord sharing his wealth^[13] and with regard to foreign trade^[10], the general interpretation of the invisible hand is as the self regulating mechanism of the marketplace within modern economic terminology.*

Before proceeding, it is prudent for the reader to ask a few questions of themselves in order to illustrate the forthcoming point. Consider your gas or electricity provider, or even your bank. Are you certain that the prices which you pay for these services are absolutely the best possible value out of all competitors? Are you certain that the rate at which you accrue interest is the best possible given your current financial circumstances at this moment in time?

What about in your home; are you certain that all of your furniture, electronic equipment or clothing is the best possible quality for the lowest possible price? It is a little more complicated to ask this of physical objects, as the value of their aesthetics or style is difficult to fully quantify, but it is entirely possible that you could have purchased the same item elsewhere for a different price.

If you answered yes to all of the above, then congratulations, as you are clearly smarter and more scrupulous than I, or indeed the vast majority of the species. However, if you answered no to some or all of the questions, then you have just discovered what is known as bounded rationality^[14]. This scientific expression of human thought was devised by Herbert Simon, acclaimed interdisciplinary professor of Carnegie Mellon.

Bounded rationality relates to our understanding of the world around us. The idea that the economy is a self regulating system which eliminates sub-optimal traders is one that makes a great many assumptions regarding this understanding. Firstly, it assumes that not only the customer that is being cheated knows that they are being cheated, but it also assumes that everyone else knows it too. This is the only way that the consumer base could possibly react to an unsatisfactory trader by taking their custom elsewhere; if they knew the trader was sub-optimal.

Secondly, it assumes that humans are actually capable of determining the deal which offers the best value. This is simple for uncomplicated products, but for more complex transactions, it is sometimes incredibly difficult to determine which product or service out of a range is better than another; take for example a personal computer.

For a consumer buying a new computer, they must peruse the speed of the processor clock, the amount of random access memory, the hard drive capacity, the operating system, the connectivity, the pre installed software, the graphics and sound cards and probably a great deal more. For a consumer to quantify which PC out of the many units available is the absolute best for their money is therefore a deceptively complex task.

It is these two aspects of the decision making process which give rise to our bounded rationality. In order to make any economic decision, we must apply computational ability and knowledge. For the natural dynamics of the economy to suffocate the 'bad apples' and favour only the best and most ethical traders, all consumers must know that a trade was unsatisfactory in the past, or be capable of calculating whether a future trade is going to be unsatisfactory. Only through this approach can human minds truly be considered rational actors within the economy. However by observation of the real world it is very simple to deduce that this is not true at all.

To illustrate how human rationality is bounded, imagine that I sought to enlist the services of a builder to put an extension on my house. I would naturally approach local firms and ask for a quote as a first step. Given the expense involved I would probably choose the cheapest, however I could easily be swayed otherwise by the charisma or friendliness of the salesman, or other subtle factors.

Let us consider for the sake of simplicity that I do select the cheapest option; there is no reason to suggest that this option is the best possible. It may be considerably more expensive than a firm I neglected to visit, or uncharacteristically cheap, meaning that the work or materials will be sub-par; I simply do not know as I am acting based on the limited information available to me.

I could possibly put in the hours researching the average wages of builders and apprentices, the overall cost of materials, the complexity of the building processes involved and a typical profit for a firm of this size, but the analysis would be prohibitively long, given my limited computational power. Similarly, I could visit all previous customers of the firms considered and ask them to evaluate the builder's performance and delivery standard against a set of criteria, but this too would be prohibitively time consuming, given the efforts I would have to go to in order to obtain this knowledge.

It is instantly obvious from this straightforward example how drastically we simplify these rudimentary economic decisions, and how we act on incomplete knowledge regarding what it is we are buying. We as consumers are not optimisers, we are satisficers^[15] i.e. we are willing to accept satisfactory trades based on our own limited knowledge. It therefore stands that in this air of bounded rationality and subjective complacency, it is entirely possible for immoral, unscrupulous and unethical traders to exist and indeed to prosper.

Indeed, the entire purpose of the aforementioned 'Rogue Trader' television programs is analogous to this viewpoint; their sole purpose is to increase consumer rationality by providing them with more information. Unethical behaviour will continue to recur, not because of a minority of bad apples, but because the market incentive will continue to reward it.

However the 'bad apples' at the more brazen end of the cheating spectrum are not the only ones who may prosper due to the consumers' bounded knowledge. There are firms within most marketplaces with strong senses of corporate social responsibility, who build their identities and reputations upon ethical trading and garner committed support from their customer base. This is all well and good, but this reputation is valuable within the corporate environment, and will very often attract interest from less scrupulous businesses.

This is indeed what we see, as staunchly ethical companies are frequently bought out by more aggressive, profit maximising corporations, and such purchases frequently result in significant changes to business ethics, whilst still trading based upon their historically positive reputation.

There are countless examples of this tactic in action, such as Ben and Jerrys Ice Cream, who were bought out by Unilever, or PJ Smoothies who were sold off to Pepsi. Ethical Consumer reviewed these businesses shortly before and shortly after their takeovers and found Ben and Jerry's ethical index dropped from 15 to just 1.5 post Unilever, while PJ Smoothies plummeted from 12 to 1.5 under Pepsi's control^[16].

These are not isolated incidents either. Green and Black's organic chocolate was sold to Cadbury Schweppes, Rachael's Organics to U.S. Deans Foods, The Body Shop to L'Oreal, Aveda to Estee Lauder and so on^[16].

What is important here is that the vast majority of consumers do not necessarily keep abreast of the changes to shareholder structure within their favourite ethical companies, nor do they continually re-assess the scores that each company receives in consumer publications. The assumption is that an ethical company is an ethical company, and this is the precise reason why profit maximising corporations have such a comprehensive history of purchasing these companies, gutting their ethical culture, and replacing it with their own.

An additional reason why the market cannot eliminate unethical trading lies in the fact that not only is our rationality bounded by our knowledge and intelligence, our ability to act is also limited by our financial circumstances. This

bounded opportunity means that even if a consumer is aware that a trade is sub-optimal, unethical, or grossly unfair, their current financial circumstances may dictate that the given product or service is the best (or even the only) option available.

Consider the case of the low quality, processed food which lines supermarket shelves throughout the Western world. The popularity of low quality and often deeply unhealthy food is one that cannot be explained by the belief of a spontaneously efficient market. It instead attests to the ability for companies to willingly make money from poor quality foods simply based on the fact that those impoverished enough will be forced to buy it. Elimination of this choice leads to a situation where unethical and unscrupulous trade can prosper.

Furthermore, the composition of a market may also affect the level of choice which a consumer may have. If a market is dominated by a company that trades unethically, then it becomes significantly more difficult for a consumer to choose better alternatives. In the run up to the financial crisis, the American financial sector was dominated by a handful of large corporations, such as Goldman Sachs, Merrill Lynch, Morgan Stanley and Bear Stearns. None of these large companies were averse to unethical or outright illegal trading, simply based on the presumption that they were too big to fail.

The idea that the market could actively disown these businesses is inherently unrealistic. Customers moving their money away from unethical traders is not possible when the vast majority of traders in a sector dabble in unethical activity. Based on these conclusions, it is not valid for us to assume that the dynamics of the market are solely able to eliminate the negative exploitative aspect of the incentives therein.

Misplaced Incentive

We have already covered how it is easy for us to reason that child labour is wrong from a moral perspective, but more difficult from an economic standpoint. Children can be paid less, meaning a larger margin. For many readers, it may seem that the usage of child labour as an argument against the market incentive is an extreme example. However what we must consider here is what depraved circumstances the dynamics of the market are currently pushing businesses and individuals towards in the modern era. It will come as no consolation that much of this corrupt, illicit and profoundly unethical behaviour makes the issue of child labour in the industrial revolution look positively sedate by comparison.

In the UK, one cannot stroll around a city centre without coming across the clothing giant, Primark. The chain store operates 150 stores in the UK alone, as well as several more overseas. The key to Primark's success lies in its incredibly cheap but fashionable clothing, which is sold at such excessively low prices that rumours of a half price sale at a London outlet triggered a 3,000 person riot in 2007^[17]. However, despite the clear popularity of the Primark brand, the chain is one that has been embroiled in controversy and criticism for its ethical malpractice.

In a 2005 ethical index, Primark came last out of all leading clothing chains in the UK, scoring just 2.5 out of 20^[18]. This index took into account criteria such as workers' rights, working conditions and trading with oppressive regimes. In 2008, Primark was further scrutinised by the BBC's undercover journalism programme *Panorama*, highlighting poor working conditions in Indian factories within the supply chain. In 2009, a supplier to Primark was penalised by the Ethical Trading Initiative, following the discovery that illegal immigrant labour was being used and paid less than the UK minimum wage^[19].

However, despite this fact being fairly widely accepted by the public, the bounded opportunity drive is simply too great to deter the populace from moving their money en masse to other clothing providers. A significant proportion of the consumer base cannot afford high quality, ethical clothing^[20], therefore Primark remains an obvious choice.

In addition, the bounded opportunity to move their money to more ethical products is not only limited by the purchasing power of the clientele. Ruth Rosselson of Ethical Consumer stated, after carrying out the aforementioned 2005 study into the UK clothing industry, that, "...we have been unable to say that any of these high street stores are an ethical place to shop." ^[18] As we have addressed earlier, if a marketplace does not offer an easily accessible alternative to exploitative business, then consumer's ability to vote with their dollar to renounce such action is not possible.

But such lewd ethics are not constrained to the arena of clothing, and certainly not to the UK. Perhaps the most shocking extreme to which this profit incentive can lead us was enacted in the early 1980s by a U.S. arm of German pharmaceuticals giant Bayer AG. At this time Bayer's Cutter Biological subsidiary was involved in the production of a product known as Factor VII, a medicine which was intended to treat haemophiliacs.

The medicine was synthesised by taking plasma donations from a pool of around 10,000 donors per batch. Bayer however did not properly screen donors for HIV or hepatitis (a HIV test had not yet been developed). Even one HIV positive donor would render an entire batch contaminated, and usage of the medicine would risk the infection of patients. Despite these risks, the concentrate went on sale. On the 16th July 1982, the U.S. centre for disease control reported that three haemophiliacs had contracted the HIV virus^[21].

Documents which surfaced in subsequent lawsuits indicate that Bayer were well aware of the connection between their product and the ill patients, as Cutter's manager of plasma procurement had stated in a letter that "*[t]here is strong evidence to suggest that AIDS is passed on to other people through . . . plasma products.*"^[21] Bayer were however not alone in this issue, and other pharmaceuticals firms began to offer Factor VII which had been heat treated, hence killing the HIV.

Many distributors, including those in France began to lean towards heat treated products as a precaution, a move which was discouraged by Bayer in a June 1983 letter to their distributors, stating: "*[t]his is of particular concern to us because of unsubstantiated speculations that this syndrome may be transmitted by certain blood products.*"^[21] Upon Bayer's reassurance, France opted to continue using unheated concentrate.

In 1984, Bayer developed its own heat treated concentrate, which began to sell positively. This led to a quandary, as Bayer now had an excess inventory of unwanted, non-heat treated medicine, as noted in the minutes of a November 1985 meeting. This was obviously a problem, as the expense in producing this concentrate had already been incurred. At the same November meeting, the minutes state that the plan was to "*review international markets again to determine if more of this product can be sold.*"^[21] Internal records show that even after they had begun production of the safer, heat treated version, 100,000 doses of the original unheated drug were sold overseas, primarily in the Far East.

Interestingly, the Food and Drug Administration's regulator of blood related treatments, Harry Meyer, informed the companies involved that it was unacceptable for them to go ahead with shipping this material overseas. However, Meyer requested that the issue be "*quietly solved without alerting the Congress, the medical community and the public,*"^[21] ultimately a move which cost many lives.

As for the number who died in this scandal, it is incredibly difficult to fully quantify. However, in Hong Kong and Taiwan alone, over 100 haemophiliacs contracted HIV and died, with talk of many more confirmed cases elsewhere^[21].

While we may balk in disgust at the nature of this action, we must once again consider that from an economic viewpoint, the action is entirely justified. Only the softer incentives of moral and social responsibility would have led Bayer to destroy the millions of dollars worth of unheated drugs. Only when we realise that actions like this are not perpetrated by individuals who are inherently evil, but are instead perfectly rational decisions made entirely within the incentives of economics, can we understand the true nature of the market.

There is no reason to think that such callous disregard for human life is localised to pharmaceuticals; it is a marketwide phenomenon, which can be illustrated by innumerable examples. We need only think about the 6,500 juvenile offenders embroiled in the “cash for kids” scandal around for-profit juvenile facilities^[22]; the string of suicides over working conditions at Foxconn’s iPhone factories^[23]; the Nestle boycott surrounding the marketing of baby formula in Africa^[24]; the Enron debacle^[25]; the list of insidious incentives leading to scandal or hardship are too numerous to mention in any depth here.

Yet our attitude to this misplaced incentive is equally misplaced. Just like the rogues on terrestrial television, we (occasionally) see these more high level perpetrators receive their comeuppance. Yet as their dethronement delights our sense of justice and altruism, we remain wilfully ignorant of the overarching value system which continually seduces those who we come to abhor. Alongside such aberrant behaviour, we accept that there are a myriad of societal aspects where it is seen as unseemly, or even disgusting for the market to intrude.

We accept that a person cannot buy and sell another as a slave; that the rich and powerful cannot use their influence to buy off political parties; that law and justice cannot be bought. The line between such contradictory viewpoints is uncomfortably blurred, as we have seen. So the question remains, why does this contradiction endure, and why does this ever changing blurry line exist between what must be regulated and what must be marketed through natural spontaneity?

The Blurred Line and the Ascent of Morality

The Colosseum of Rome is one of the world’s most enduring and recognisable architectural specimens, and stands as a testament to the engineering prowess of the Romans. Yet the grandeur and elegance of the structure does not in any way detract from the unthinkable brutality which it and countless other amphitheatres

were constructed to service. In ancient Rome, gladiatorial battles, executions and other such public spectacles of gore and perversion were as commonplace and accepted as the competitive sports of today. The word ‘unthinkable’ is seldom more apt than when looking retrospectively at our past infatuation with violence.

So why do members of the general population not sing the praises of the current age of peace? The current world we inhabit is the most peaceful time in our entire history, yet this tagline is not something that is often heard in political conversation.

Steven Pinker has described this trend of declining violence at great length in his book *The Better Angels of Our Nature*. Pinker argues that the decline of violence is a result of five primary historic factors; the rise of nation states and justice systems, the development of technological and commercial interconnectivity, growing empowerment of women, the increased ability to empathise due to literacy and communication, and the rise of rationality and knowledge^[26].

Now, we must be quick to sidestep the argument that simply because violence has declined from levels in the past, we may rest on our laurels and continue to use market economics as our driving force, based upon the assumption that the above criteria will continue to be fulfilled. Pinker's argument rests partially upon the idea of commerce, but it uses trade solely as a mechanism by which technological progress is made, and interdependence between otherwise disparate people is fostered. Furthermore, it is clear that while violence has fallen, it remains commonplace today, both in its bare faced form, as well as in more subtle guises.

The point that we must instead focus on is that the rise in knowledge, rationality, justice, literacy, communication, empathy, technology and personal empowerment has resulted in less tolerance for violent behaviour and undue suffering within society.

What is especially of interest here is that such a trend is so invisible to the population. To consider that we are currently in the least violent age of humankind's history is a stubbornly difficult point to accept. Wars and civic unrest are common, slavery is rife and violent crime occurs within even the most developed countries. This turmoil, or more fittingly – the way we perceive these phenomena as turmoil is a reflection not of our depravity, but rather of our steadily rising standards^[27]; the crux of this subsection of the chapter.

What we must accept is that our collective moral value system is in a constant state of ascendant evolution. As an illustration to this point; even in the poorest and most deprived of today's countries, a regular gathering of 50,000 people to witness a bloodbath is not something which one would expect to see. Yet a handful of millennia ago, among the most advanced and educated empires of the world would gladly indulge in such visceral entertainment. Those who condone or enjoy graphic and gratuitous violence against humans are very much sidelined in our society, in comparison to a typical medieval or classical civilisation, where such values would be more commonly accepted.

The trend however is certainly not limited to violence, and if we look carefully we can observe similar steadily rising standards wherever we interact. Leaps and bounds have been made in the realm of animal rights, particularly in the last 200 years. Well organised animal charities are widely known and supported in our society. Legislation to protect animals is also becoming ever more developed, with Catalonia recently becoming the first Spanish independent territory to ban its historic sport of bullfighting, based on cruelty towards the animal^[28]. Such a motion would have been unimaginable to 17th century denizens of Paris, who regularly clamoured to witness cats being hoisted in a wicker basket and burned alive as a form of comedy^[27].

In politics and government, great progress has been made to fight against corruption through legislation and openness, to promote democracy and ideological or religious freedom, and to encourage and defend freedom of expression at all levels; all things which would be anathema to many a feudal lord, or a divine monarch of medieval Europe.

Systems of welfare, international conventions of combat and war, national healthcare systems and rehabilitative prisons are all relatively new inventions in human history, and would be alien to visitors from aeons past. Indeed, an audacious meta analysis by Ronald Inglehart and Christian Welzel, which spoke for societies comprising around 85% of the global population, agreed with this sentiment. The meta analysis found that the individual autonomy, gender equality, and democracy have become increasingly common across all societies undergoing development. Not only this, but the extent to which these trends emerge are also correlated with the level of development of the society^[29].

While abhorrent treatment of human beings through slavery and child labour may be common beyond the West, it is once again an aspect of human society that has slipped into the lexicon of the taboo rather than of everyday speech. It is a fairly well known fact that by numbers there are more slaves today than at any

time in our history^[30], but this is a fact which is remembered entirely for the reason it is so repugnant that it makes one uncomfortable. The existence of a secretive yet prosperous slave market may seem worlds apart from the hundreds of thousands of Americans who gave their life for the cause of emancipation, but it is equally remote from the world where young men and women were openly bought and sold, openly beaten and openly abused.

So what connects our ascendant sense of morality and the free market ideology which commands the reigns of the modern economy? Firstly, we have already established that the fundamentals of market incentives are able to clash with our moral or altruistic incentives if left unchecked. Secondly, we have also established that through the development of modern civilisation, we have seen a holistic moral evolution away from violence and cruelty. Thirdly, our lack of complacency with respect to the current state of society's values reflects an urge to continue this progression towards a safer and more peaceful society. By simply joining these discrete points together, we can see that our moral ascendancy is progressively eroding the domain which our collective attitudes allow the market to occupy.

To illustrate this difficult point, consider the case of the economy of Hong Kong, as perused earlier. By modern standards, Hong Kong represents an incredibly free market, but to a traveller from the past, such an economy would seem incredibly rigid and constrained. Law would forbid employment below a set minimum wage, unreasonable work shifts, rackets, the sale of humans, prostitution, acquisition by force, bribery, blackmail, etc. The relevant laws are not made to repress such activities because they are economically unviable, (in fact the enduring existence of some attest to their immense profitability) but rather because of their ramifications within society being incompatible with the moral attitude of the day.

Extrapolation into the future is something which cannot be entirely trusted, but indicators pointing towards the continuation of the moral ascent, and thus its ongoing encumbrance of the market incentive system, are fairly strong. Many countries across the globe are beginning a concerted clamp down on advertising, with Norway and Sweden banning all advertisements targeting children, and Greece limiting it to after 10pm^{[31][32]}. Advertising elsewhere is also becoming incrementally more pinned down, as regulations warning people about product placement come into force in the UK, while alcohol and tobacco advertising continue to be tightly controlled.

Elsewhere, the precursors of a more serious battle between morals and markets are beginning to emerge. In 2010, the UN declared access to water and sanitation a universal human right^[33]. It is expected that in coming years, the right to food will follow, after heavy backing from the United Nations Food and Agriculture Organisation from 2007 onwards. Granted, these bills will not mean instant abundance for all the world's people, but it is relatively easy to imagine coming generations being increasingly baffled by the concept of paying for a universal human right.

Diluting Terms

Perhaps more than any other theatre, political and economic theory demands rigorous and unambiguous terminology in order to facilitate discussion. When ideology and history are so intertwined as they are within social critique, it becomes somewhat difficult to talk unambiguously, as loaded terms are thrown around with impunity. Our modern paradigm is frequently referred to under the immensely broad term 'capitalism', yet despite this absolutist label, there are many nuances which must be considered.

The unfettered capitalist economy is one which is entirely theoretical, and draws fairly close parallels with aspects of the modern libertarian stance, in that it promotes an almost anarchical, self regulating society, based solely upon the market principle.

Within our modern mixed economy, the 'capitalism' component always finds itself being diluted by a powerful state component, which at a minimum is expected to enforce the rule of law. This circumstance endows free market proponents with a powerful counter-argument when faced with the unpleasantness of the modern economy, as they may easily bring their axe to bear against the state for corrupting the assumed natural, spontaneous order of the marketplace.

As such, the taxpayer funded bailouts of large financial institutions following the 2008 crisis were as abhorrent to free market capitalist principles as any other socially funded solution. Similarly the molycoddling of powerful institutions by governments, through low tax rates, loopholes and lobbyism are all equally against the ideals of free marketism.

In light of the above, the usage of the term 'crony capitalism' to describe such a rigged marketplace has become a textbook rejoinder for defenders of the free market when confronted with critique. Needless to say, I find this distinction entirely unnecessary, and view the term as a disingenuous tact to shift any

criticism of the market incentive system onto the easy target that is the loathed nation state.

We will discuss this much more deeply in chapter 1.7, however I felt that this distinction merited a brief mention within this chapter in order to more firmly position a stance against the raw market incentive system, rather than a piecemeal mixed economy.

Conclusion

In such a broad and complex topic, a sense of purpose must underpin the study at all points. We therefore must return to our overarching question which drives this entire section of the book. Fitting our opening chapter into the rich mosaic of civilisation; we must determine whether the incentives we encourage via the market mechanism are a benefit or a hindrance, and whether such a system will endure into our uncertain future.

In our conclusion of the topics covered, we must be careful in tarring market economics as a whole with arguments supporting undiluted free market ideologies, as there is certainly a vast spectrum of viewpoints relating to the role and level of regulation. However, we must come to understand that these differing viewpoints are an inherent manifestation of the blurred line between altruistic and market incentives.

Whatever ratio of regulation is proposed, the rationale will always be based upon a subjective trade off between the benefits of the market incentive and the moral prerogative to combat and regulate its negatives. Even the freest market today is defined by an identical set of subjective judgements.

As cultural evolution seems to thrust us towards a society more disgusted by violence, it seems natural that this spectrum of regulation will recede towards a level which is more in keeping with the values of the day. Therefore rather than concluding based on an exaggerated straw man, we must conclude accepting the basic incentive structure in all forms, simply because there is no empirical way to distinguish between a fully free market and a regulated market within our cultural frame of reference.

Due in part to our moral ascent, it has become commonplace for such mixed economies comprising market freedom and regulation side by side to attain high levels of growth, to prosper and in turn deliver prosperity for their people. It is also commonplace for pseudo-free markets to deliver growth and prosperity. More economic minded arguments may draw the line of benefits of growth, but

this axiom is not considered in this chapter (see chapter 1.13). Instead, we must draw our conclusion solely on the benefits of the raw incentive mechanism which drives the global economy.

It is certain that Adam Smith's self interest argument is a valid one, and the motivation mechanism at the very least appears to work well in practise. It is also one which aligns approximately with the ideal of spontaneous order, as we have seen. However, the requirement of regulation attests to the misalignment of the market incentive with such an ideal. As we have seen, the free market is anything but free. It is propped up by countless rules and regulations which maintain and govern it.

While this is not necessarily a bad thing, we must consider why the natural spontaneity of the system requires such regulatory intervention at any level. We have two possibilities before us: that the market mentality is in keeping with the ideal, but natural spontaneity is incompatible with the idea of an enduring and peaceful human civilisation; or that the market incentives at play do not represent natural spontaneity at all.

Without venturing too far into such unanswerable philosophy, we can observe that either side of the coin holds some level of value. The animal kingdom is an eternal theatre of exuberant and self directed succession, but it is also a theatre where overshoot, decline and extinction are not foreign terms. Spontaneity will not always bring about the best results for a population, especially in the case of an existence which is as unconventional as human civilisation.

On the other side of the coin, we have already begun to see the abstraction of the financial playing field under our feet (more on this in chapter 1.4). Natural spontaneity can only be so if it relates to natural terms, which is all well and good provided our currency system is a realistic representation of real world value. Selection in ecosystems is rooted in real resources, while in human culture the selection is driven by currency, which is a virtual representation. Our ability to change the rules of our own game permits economics to be insensitive to factors which are not fully modelled by the virtual environment, such as corruption of the financial system, externalities and their cumulative effects.

Which of these scenarios is true is ultimately inconsequential, as both lead us to the same conclusion; that the market incentive does not align with an ordered, natural system, as Hayek and others have claimed.

However, simply because we have deduced that the incentive system is not aligned with natural law does not make it bad per se. The actual function of regulation beyond the argument of spontaneous order must be considered to answer this problem. Regulation is ultimately a defence mechanism against the unwanted or damaging effects of the incentive system.

We have already deduced that societies are perfectly capable of achieving a reasonably high level of peace in the presence of regulation (remembering that even the freest free market is heavily regulated), but we must consider whether creating such vast and innumerable bodies of regulation to perpetually fight the dominant cultural and economic mentality is an ideal solution at all. The short answer to this seems to be that it is not, and the man hours which are sunk into this legislative war against our fundamental cultural incentives would be far better spent elsewhere.

So we have concluded that our current modus operandi is misaligned with its natural inspiration, and regulatory patchwork is inherently inefficient, but we have not yet determined whether it is directly beneficial, or applicable to our ever changing future. Again, we come back to the extant peaceful economies which populate the Western world, which rely on market economics and get much in return.

The benefits of these economies, the companies and corporations who do considerable good must be carefully weighed up against the negative points which the incentive brings. Such negatives as unscrupulous traders, fraud, corruption, etcetera. In a somewhat anticlimactic end to the chapter, I do not want to tell you what to think regarding this trade off, as ultimately we must all draw our own judgements based on our sense of ethics.

This is the essence of the blurred line, and we must all choose our own stance. Each individual will be willing to accept an entirely subjective level of what is a reasonable compromise between positive and negative market repercussions. What can however be concluded fairly decisively is that, if our aggregated moral ascent continues, ultimately the average moral judgement of the incentive trade off will tend towards a less accepting view of the negative implications.

To round off the chapter, we have deduced that the market incentive is an inefficient and imperfect model, which provokes an eclectic mix of behaviours, subjective to the moral views of the actor. We therefore cannot definitively apply a sweeping statement here that suggests that the market incentive is intrinsically damaging, as 'bad' is highly subjective in this case. The incentive

merely seduces actors with the benefits of immoral or damaging behaviour, such that the incentive is a potential threat but not a blatant one.

As the freedom of the market is indefinable by empirical measures, and completely subject to cultural relativism, the outcome of this analysis is dependent on exactly how damaging behaviour inspired by the incentive is. It would be a fruitless and unethical argument to attempt to coerce the reader into a conclusion to either side of the debate without evidence. Instead, the path followed by subsequent chapters is to illustrate the severity of the negative implications created by the market incentive. Armed with a deconstructed view of the market incentive, we are now able to move forward and peruse the issues which beset us in a more critical light.

Chapter 1.1 - References and Notes

- [1]. Freidrich Hayek. *The Fatal Conceit: The Errors of Socialism*. Chicago : Routledge Press, 1988.
- [2]. Robert Owen, *A New View of Society and Other Writings*. London : Penguin Classics, 1927.
- [3]. Anonymous. *HL Deb 14 June 1819*. UK House of Lords Hansard. London : UK House of Lords Information Office, 1819. Vols. 40 cc1130-3.
http://hansard.millbanksystems.com/lords/1819/jun/14/cotton-factories-regulation-bill#s1v0040p0_18190614_hol_3.
- [4]. Ha Joon Chang, *23 Things They Don't Tell You About Capitalism*. New York : Bloomsbury Press, 2011.
- [5]. *Living Heritage: Reforming Society in the 19th Century - Early Factory Legislatio*, UK Parliament - <http://www.parliament.uk/about/living-heritage/transformingsociety/livinglearning/19thcentury/overview/earlyfactorylegislation/>.
- [6]. About the Index. 2011 Index of Economic Freedom - <http://www.heritage.org/index/about>.
- [7]. 2011 Top Ten. 2011 Index of Economic Freedom - <http://www.heritage.org/index/topten>.
- [8]. Hong Kong Legal Authority. Chapter 59A - Factories and Industrial Undertakings Regulations. 1997.
- [9]. *Ibid*, Chapter 57 - Employment Ordinance. 1997.
- [10]. Adam Smith, *The Wealth of Nations*. London : W. Strahan and T Cadell, 1776.
- [11]. Access to Justice Act 1999, Chapter 22, 3.8.99.
- [12]. Lord Young of Graffham. *Common Sense, Common Safety*. London : HM Government, 2010.
- [13]. Adam Smith, *The Theory of Moral Sentiments*. Edinburgh : Prometheus Books , 1759.
- [14]. Herbert Simon,. *Models of Man: Social and Rational- Mathematical Essays on Rational Human Behavior in a Social Setting*. Wiley, 1957.
- [15]. Herbert Simon, *Rational Choice and The Structure of the Environment*, Psychological Review, Vol. 63 No. 2, 1956.
- [16]. Neal Lawson, *All Consuming*, London: Penguin, 2009

- [17]. *The battle of Primark: 3,000 customers force their way into new store*. London Evening Standard, April 2007 - <http://www.thisislondon.co.uk/news/article-23391712-the-battle-of-primark-3000-customers-force-their-way-into-new-store>
- [18]. *Top store is rated 'least ethical' place to buy*. The Independent, December 2005 - <http://www.independent.ie/world-news/europe/top-store-is-rated-least-ethical-place-to-buy-224923.html>.
- [19]. *Primark in storm over conditions at UK supplier*. The Guardian. Jan 2009 - <http://www.guardian.co.uk/business/2009/jan/11/primark-ethical-business-living>.
- [20]. James Hall. *Sales of ethical clothing fall as slowdown bites*. The Telegraph. Sept 2011 - <http://www.telegraph.co.uk/finance/newsbysector/retailandconsumer/8750364/Sales-of-ethical-clothing-fall-as-slowdown-bites.html>.
- [21]. Walt Bogdanich and Eric Koli, *2 Paths of Bayer Drug in 80's: Riskier One Steered Overseas*. The New York Times. May 2003 - <http://www.nytimes.com/2003/05/22/business/22BLOO.html>.
- [22]. Stephanie Chen. *Pennsylvania rocked by 'jailing kids for cash' scandal*. CNN Justice. Feb 2009 - http://articles.cnn.com/2009-02-23/justice/pennsylvania.corrupt.judges_1_detention-judges-number-of-juvenile-offenders?_s=PM:CRIME.
- [23]. *Foxconn suicides: 'Workers feel quite lonely'*. BBC News - Asia Pacific. May 2010 - <http://www.bbc.co.uk/news/10182824>.
- [24]. Joanna Moorhead, *Milking it*. The Guardian. May 2007 - <http://www.guardian.co.uk/business/2007/may/15/medicineandhealth.lifeandhealth>.
- [25]. *Enron Scandal at-a-glance*. BBC News - Business. Aug 2002 - <http://news.bbc.co.uk/1/hi/business/1780075.stm>.
- [26]. Steven Pinker, *The Better Angels of Our Nature: A History of Violence and Humanity*, Penguin, 2012
- [27]. Steven Pinker, *A History of Violence*. The New Republic, 2007.
- [28]. *Catalonia bans bullfighting in landmark Spain vote*. BBC News Europe. Jul 2010 - <http://www.bbc.co.uk/news/world-europe-10784611>.
- [29]. Ronald Inglehart, Christian Welzel, *Modernization, Cultural Change and Democracy: The Human Development Sequence*, Cambridge University Press, 2005
- [30]. E. Benjamin Skinner, *A Crime So Monstrous: Face-to-Face with Modern-Day Slavery*. Simon & Schuster, 2009.

- [31]. Patti M. Valkenburg, *Media and Youth Consumerism*. Journal of Adolescent Health, 2000.
- [32]. *Children, Adolescents, and Advertising*. American Academy of Pediatrics, 2006.
- [33]. *The human right to water and sanitation* - Resolution A/RES/64/292. United Nations General Assembly, July 2010

1.2 The Engine of Economics

THE INTRICATE TAPESTRY of the modern economy is in some respects a beautiful operation to behold. The eclectic and multi-faceted threads of individuals, governments and businesses weave so effortlessly over, under and betwixt one another in ways which a single mind would struggle to fully comprehend. Through the power of a universal medium of exchange, extraordinarily complex interactions are made possible. Overarching this, and guiding these threads is the invisible but ever present market incentive.

Within our tapestry of trade and exchange, where each of us focus our concerns upon our own miniscule thread of economy, individual prerogatives are banal and obvious. Naturally, a typical individual would lay emphasis on exchanging their skills for a safe and stable wage, as a staple of their own self directed concern. Other secondary concerns may lie in acquiring goods, collecting experiences, or enjoying services, all made available by the aforementioned wage. Others may aim higher and use their talents to forge skyward at the expense of stability, but endowed with the prospect of great payoffs.

Governments and businesses operate in similarly mundanely obvious manners, focusing their desires on generating a healthy turnover or GDP in order to remain competitive in the global marketplace. Tertiary components of the economy, such as investors and financial institutions operate differently only in detail, looking to utilise money directly in order to accrue healthy revenue for themselves.

It is however through such banal and apparently rational behaviours at a microscopic level that our macroeconomic paradigm becomes inherently irrational, unstable and damaging, as I will argue in the coming chapter. The universal dependency upon income demands that such incomes be sustained and perpetual. By default, the sale of goods, waged labour or services must also be equally sustained and perpetual.

A cycle of dependency therefore develops, whereby an individual requires a salary dependent upon an employer, and an employer requires a consumer dependent upon a salary. The implication of this is as obvious as the simple core principles with which the market weaves our tapestry; society becomes totally dependent on uninterrupted, repetitive consumption. Society becomes dependent upon never ending production of goods and services, upon never ending labour and never ending purchasing. This chapter wrestles with the implications of this axiomatic ideal of consumption, and why apologetics for this behaviour is so fundamentally flawed.

Cyclical Consumption

The requirement for a cycle of consumption is a relatively new phenomenon, and one which has poorly understood implications within our current population. It will be discussed in the following subsection as to how civilisation came upon cyclical consumption, and how it was actually a significant talking point for the initial phase of the 20th century.

Firstly, it seems important to cement exactly what the consumption cycle is and how it works. As shown in Figure 1.2-1, the cycle has three actors; consumers, employers and employees. The flow of value circulation follows the arrows in the following process.

- The Employer pays wages to the Employee to create a product or service.
- The Employee creates products or services to meet the needs of the Consumer.
- The Consumer purchases the product or service and pays the Employer.

What is interesting to note is that each actor within the cycle is dependent upon all other actors. The Employee requires the Consumer to buy the products and the Employer to continue paying wages; the Consumer requires the Employer to continue paying wages, such that the Employees may continue producing goods, and; the Employer requires Employees to continue producing goods that the Consumer is willing to pay for.

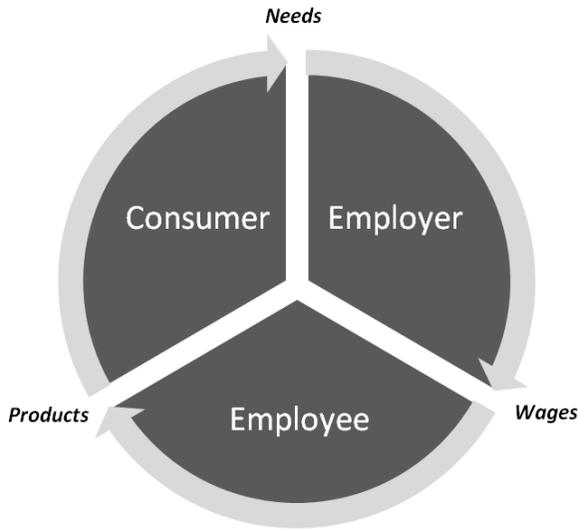


Figure 1.2-1: Diagram of the cycle of consumption

The Employer requires a flow of 'needs' from the Consumer in order to translate these needs into a business model. These needs may simply be the need for food, or the need for a new kind of invention. The Employee requires a flow of 'wages' from the Employer in order to create products which fulfil consumer needs. The Consumer then requires a flow of these 'products' (which may just as well be intangible services) in order to meet their needs.

A realistic caveat however must be included here. That is, that the consumer is technically not a distinct actor in itself, instead being simply an additional role for the employers and employees. An entrepreneur or a CEO of a large business will likely employ many personnel, giving him the role of employer in this cycle, but they will also be personally dependent upon a supply of goods and services (food, transport, luxuries etc.) in order to survive. The same is true of any employee that may work below them.

The details in these cases do not matter massively, as the terminology is rooted in fairly antiquated industrial theory and as such is often centred upon a factory setting. The general point to capture here is that these three distinct roles within the economy exist and interact in the ways described.

It therefore follows that, at its most basal, the cycle may be viewed as a process by which exists to meet needs. With all of society, including employers and employees, falling within the remit of the Consumer, the cycle acts to meet the

needs of all based upon the self directed incentive structure which we have already perused in the previous chapter. Employers similarly act to meet the fiscal survival needs of their own business by targeting niches in Consumer needs. Employees satisfy their need for wages by offering their services to said Employers.

This is the basis of the consumption cycle, and with its core philosophy revolving around needs and wider social benefit, its general concept is one which is extensively lauded and covered richly in contemporary economic literature (although often with different terminology).

This chapter however intends to present the argument as to why this model is an unsound foundation for the organisation of social and industrial interaction. As with the previous chapter, if the above summary of the modern marketplace is contentious, then feel free to proceed with your own definitions and arguments.

A preliminary caveat is presented before we proceed; the transition to a “knowledge economy” or a “digital economy” is a primary point of apologetics for a cyclical consumer society, and it is one which seems superficially plausible. However, for neatness, this point is covered in chapter 1.13, where the idea of resource decoupling from economic activity becomes more relevant.

The Arise of Obsolescence

The Google NGram project is perhaps one of the more interesting of the creations to emerge from the forward looking search engine giant. The project encompasses the digitisation of over 5 million books from over 2 centuries, and smart algorithms which may be used to query the database of books instantly.

Such a wealth of information available to be filtered and searched at the click of a mouse has led to a fascinating ability; to track how a word (a unigram) or a phrase (an n -gram) has been used over time.

Such a tool is unimaginably powerful in telling us how words have come into and fallen from usage over time, and the words which cement this chapter are no exception. The usage of the word 'obsolescence' is shown in Figure 1.2-2 and follows a fairly sharp ascendancy. The word is used sporadically and minimally throughout the 1800s, before rising to prominence and coming to a peak of usage through the 1940s and 1950s. The word then falls from usage as we near the end of the 20th century.

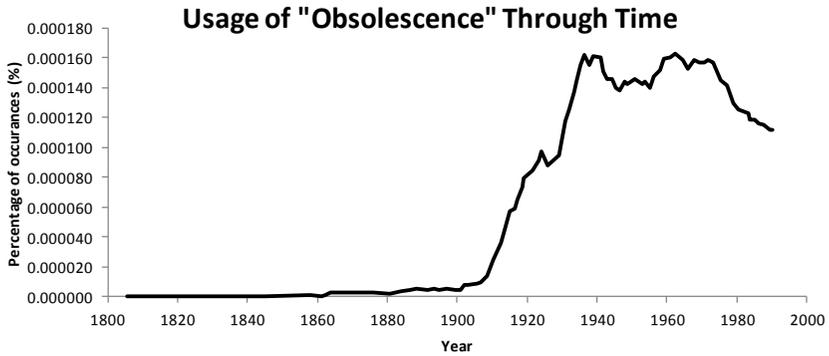


Figure 1.2-2: Usage of the word "Obsolence" in English literature from 1800 to 2000 - Adapted by author from Google NGram function

It is clear that this word is invoked into more common usage by some phenomenon, probably occurring during the early 20th century and sustaining as a strong conversation point throughout the 1940s and 1950s.

So what was this trigger phenomenon during the early 1900s, resulting in lengthy conversation across the 1940s and 50s? What else were the producers of goods talking about while the word obsolescence began to creep into everyday usage with more and more regularity? In the late 1800s, King Camp Gillette, tycoon behind the world famous shaving brand, with ominous foresight, gave his interpretation of the economic misdirection that would result in the malaise which grasped the American nation decades later.

“We have the paradox of idle men, only too anxious for work, and idle plants in perfect conditions for production, at the same time that people are starving and frozen. The reason is overproduction.”^[1]

Gillette’s commentary would become all too accurate when the New York stock exchange famously crashed in 1929, but the crux of his point here is not the economic stagnation in America, rather the trend of overproduction. An n-gram analysis of 'overproduction' in Figure 1.2-3 shows surprising correlation with usage of the word 'obsolescence'.

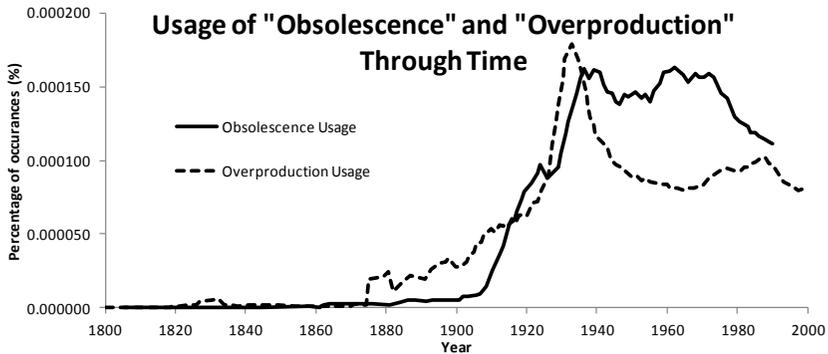


Figure 1.2-3: Usage of the words "Obsolescence" and "Overproduction" in English literature from 1800 to 2000 - Adapted by author from Google Ngram function

Again we see a pronounced peak around the 1940s, but with a more abrupt fall off towards the end of the 20th century. We cannot be so quick to jump upon the idea that overproduction is the key, based upon the writings of a single magnate, however as we shall see in the coming subsections, the conversations surrounding overproduction and obsolescence are of great importance in the history of a cyclically consuming society.

Actions behind the Words

So what does all of this word usage analysis mean? We have assessed that conversations and literature on the concept of obsolescence were commonplace in the mid 20th century, but it tells us nothing as to what these discussions entailed. Firstly, what is this obsolescence and what does it mean?

Let it be known that obsolescence is not necessarily a good or bad thing on its own merits. There are indeed attributes of obsolescence which are fundamentally required in order to allow for technological progress. For clarity, four different definitions will be outlined here:

- Technological obsolescence.
- Functional obsolescence.
- Planned obsolescence.
- Perceived obsolescence.

Technological obsolescence is simply a function of the progression of technology. The CD player for instance brings benefits which are more advanced than those offered by a cassette player, a progression which renders the cassette format obsolete. Many other examples are available to list here, but

the idea behind technological obsolescence is fairly simple and does not need further elaboration.

Functional obsolescence is the limit to the functional lifespan of a product. A product will typically experience wear and tear, degradation and loss of performance through its service life, eventually rendering it non-functional, and thus, obsolete. This is again a simple concept which needs little illustration.

Planned obsolescence is where it begins to get interesting, as obsolescence here ceases being a *result* of progress or usage and becomes an *aim* of progress and usage. A product which is subject to planned obsolescence is one which has its service life limited by design or marketing strategies. To add a twist, planned obsolescence may be applied via either functional or technological means. For example, a product which is made of inferior quality and will cease to function more quickly than a robust design is planned for functional obsolescence. Conversely, a product which is continually and purposefully re-launched with incrementally improved technologies is one which is planned for technological obsolescence.

Perceived obsolescence is the final category, and is one which may be planned or un-planned. Perceived obsolescence occurs when a cultural, style-based or trend-based factor renders a product undesirable or limited in usefulness, before the end of its technological or functional lifespan. A classic example of this would be clothing and fashion. The clothes which are discarded in a consumer society are typically not functionally useless, and are certainly not superseded by more hi-tech clothing. They are often discarded because of cultural fashion trends rendering garments inappropriate or unfashionable. Aesthetics are an important factor in perception, and typically the ideals behind perceived obsolescence are similarly aesthetic in nature.

All four of these subcategories of obsolescence became of paramount importance around the turn of the 20th century, as exciting and unprecedented new industrial processes began to affect the economy in unexpected ways. Businesses and customers grappled with constantly changing market dynamics, as our technological expertise and production capacity exploded. It was our response to these trends which changed the face of modern society dramatically, and massively altered our political and industrial landscape. This period is therefore critical in understanding the cycle of consumption, how it came about and how it was accepted as the definitive social norm which is so axiomatic today.

Disposability

It is the 1890s, and an impetuous 36 year old entrepreneur sits in the parlour of a Baltimore mansion. The inventor of the disposable bottle cap, William Painter, is discussing business in his cavernous home. When asked about the secret to his success in business, Painter replies “*Think about something like the Crown Cork [the trading name for his bottle cap invention] the customer keeps coming back for more.*”^[1] The success of the Crown Cork lay in the fact that bottles had previously been plugged with reusable rubber bottle stoppers. The Crown Cork differed from this line of thought as rather than being designed to be used again, it was specifically designed to be disposable. The simple metal cap differed little from modern bottle caps, in that the metal needed to be permanently deformed in order for the cap to be removed.

The pearls of wisdom from Painter’s Baltimore mansion rubbed off on the budding businessman, and it was in 1895 when shaving with a blunt razor in Pennsylvania that a moneymaking idea came to life. The expense of the traditional razor blade and its need for intermittent sharpening and honing frustrated him. Harking back to the words of Painter, the young entrepreneur saw an opportunity too great to pass up. Why not create a cheaper razor blade which may be used a handful of times before being discarded? Why not ‘keep the customer coming back for more’? The Gillette razor was born^[1].

Gillette’s venture into disposability would take several years to master, only brought about by leaps and bounds in metal production methods. However his capitalisation upon efficient, modern mass production in order to invoke repetitive consumption was not a new idea. As early as 1876, retailers grew frustrated with their inability to shift goods. America was “*suffering from overproduction*” and everyone already had the goods that were being made. “*The warehouses of the world are filled with goods*”^[3] they claimed, and demand for products showed no sign of sating this rampant production.

In the year 1872, America had already seen dabbles into disposability, in order to loosen up this stalemate of demand and supply. Revolutions in mechanical paper production had created vast surpluses of high quality paper sheet, far outstripping any demand from conventional use of the material.

However paper found its new role in an unusual location, as disposable shirt collars and cuffs for men, endowing great success to the businesses which supplied them. For working men, the collars and cuffs typically bore the brunt of dirt build up, and in an era when laundry was an arduous task, the simple act of

discarding a removable cuff was attractive. This was echoed in astonishing sales figures for the time, with over 150 million of them sold in 1872 alone ^[4].

Usage of paper as a disposable alternative sat relatively comfortably alongside the typical frugal attitudes of the day. Simple paper items were painless to discard, as they could be cast into a fireplace and forgotten about. However as disposability inched its foot into the door of the American consciousness, soon inhibitions with regard to throwaway items lowered, and the landfills began to sprawl.

Steel production had come on by leaps and bounds approaching the turn of the 20th century, and among those to take advantage of these new methods were pocket watch manufacturers. Traditional steel watches were reliable and widely available, made from good quality, and available in tremendous abundance, but it was the Ingersoll watch company who made an indelible mark upon this era with their Yankee model.

The Yankee watch utilised cutting edge steel pressing methods to produce watches at a rampant rate. By 1899, the company were producing 8,000 watches per day. The watches sold for a dollar in 1901, while other more upmarket watch brands of the day sold at around 10 dollars. The attraction to the “dollar watch” as it became colloquially known, was that one dollar was approximately a day’s pay for a working man, so in the event of a watch being broken (a Yankee typically held time for a year) a worker could just buy a new one without any need for saving. This is reflected in the unpopularity of the company’s returns and repair service, with only 3% of Yankees ever being returned for repair or replacement over their production life^[5].

The 20th century saw more and more companies introduce disposable items in order to sell their way out of overproduction. The throwaway culture began to progressively supersede traditional thrift and frugality as promoted by home economists, and the love of durable and rugged Craftsman design.

The rise of the tissue giant, Kleenex supplanted the traditional, reusable handkerchief market, and saw great success in doing so. Johnson and Johnson introduced the single use Band-Aid as a replacement for reusable cotton bandages. Joseph Gayetty’s, and later Thomas, Edward and Clarence Scott’s disposable toilet paper progressively replaced the usage of bidets in Europe^[6], while drinking straws, paper cups, condoms and ladies’ sanitary towels all saw success over their reusable predecessors^[7].

It seems almost quite humorous when considering such mundane items, and how today it is not even pondered that at some point there was not only a reusable alternative, but also resistance to disposable versions. However, the economic stimulus and the easy life which this throwaway culture ushered forth were too good to turn down, and repetitive consumption began to gradually nose ahead of traditional prudence and conservatism.

During WWI, thrift campaigns were met with fierce resistance from businesses nationwide, not willing to let go of the repetitive consumption which had dragged them from the malaise of overproduction. In 1917, signs on shops nationwide proclaimed “*Business as Usual, Beware of thrift and unwise economy!*”

By the 1920s, retailers and economists became more aggressive against thrift, portraying it as vulgar and a waste of life. As America was thrust into the roaring twenties, on a wave of economically potent repetitive consumption, engineers, politicians, designers and salesmen increasingly denounced durability and thrift, and shifted their favour to disposability and capacity for cyclic consumption^[8].

Wear Alone is not Enough

Disposability may have aided the economy in outrunning overproduction to an extent, but it was soon to be complemented by an additional stimulus for cyclic consumption. In 1928, Paul Mazur authored a book called *American Prosperity: Its Causes and Consequences*. In this publication speaking about the state of the American economy, Mazur argued that “*Wear alone... [was] too slow for the needs of American industry. And so the high-priests of business elected a new god to take its place... Obsolescence was made supreme.*”^[9]

While Mazur used the word obsolescence with such bluntness, he was far from the only contemporary author to use this word to describe the shifting perspectives in industrial production. Multi-disciplinary author and editor J. George Frederick used the word obsolescence to describe similar trends in a 1928 article in *Advertising and Selling*, stating; “*We must induce people... to buy a greater variety of goods on the same principle that they now buy automobiles, radios and clothes, namely; buying goods not to wear out but to trade in or discard after a short time.*”^[10]

Frederick was far less direct with the term, initially shying away from the obsolescence 'god' that Mazur described and instead coining the distinctly safer term “the progressive obsolescence principle.” Mixing the generally bad

connotations of obsolescence with the positive image of progress, Frederick no doubt chose his words carefully.

His wife, Christine, was also vocal in her use of the buzzword of the day. The liberation of women and their new found consumption habits became a source of interest in Christine Frederick's *Selling Mrs Consumer* in 1929, where she argued that: "*Women are far heavier consumers of personal goods than men, utilizing the principle of obsolescence far more frequently and naturally.*"^[11]

However the discussion surrounding obsolescence was only beginning, and later that year, the Wall Street stock exchange plummeted, plunging the nation into an infamous period of dismay. The once forgotten American traits of frugality and resourcefulness made a temporary return, as citizens became unable to acquire the cheap and abundant goods which they had become accustomed to. The market was at a stalemate as consumption ground to a halt. Jobs dried up, demand waned, and the nation entered a bitter slowdown which would endure for several years.

It was during this period that radical alternatives began to be considered in mainstream political thought, one such political movement became known as technocracy. Technocracy suggested that the crash was fundamentally caused by the profit motive, and that the magnates of large corporations cared only about profit and not balancing supply and demand. The de facto leader of the movement, Howard Scott argued that engineers and scientists should be appointed to run the economy in order to tackle the strictly technical issue of balancing supply with demand.

The movement gathered a significant following, and by 1932 was a common topic of discussion in American society. However the movement attracted staunch criticism from business leaders, criticisms which were not adequately addressed by Scott, who was untrained in public relations of any form. The public lost interest for the movement, and by 1933, mainstream momentum had fizzled out^[12].

However, engineers being central to the economy remained a talking point, and in 1932 Sheldon and Aren's *Consumer Engineering: A New Technique for Prosperity* suggested a new path back to prosperity. It was recommended that businesses be rebuilt around a new profession, known as the 'consumer engineer.'

“Consumer engineers must see to it that we use up the kind of goods we now merely use. Would any change in the goods or the habits of people speed up their consumption? Can they be displaced by newer models? Can artificial obsolescence be created? Consumer engineering does not end until we consume all we make.”^[13]

Like J. George Frederick, Sheldon and Aren also experimented with wording, avoiding the word obsolescence when describing their social model, and using the portmanteau of “Obsoletism” instead^[13].

On a similar tangent, in the summer of the same year, illusive real estate broker Bernard London released a brief treatise entitled, *Ending the Depression Through Planned Obsolescence*. In his self released publication, London suggested that a good’s lifespan should be:

“...controlled by the duly appointed governmental agency and destroyed if there is widespread unemployment. New products would constantly be pouring forth from the factories and marketplaces, to take the place of the obsolete, and the wheels of industry would be kept going.”^[14]

London argued that all goods must have a predetermined lifespan, and that these lifespans must be adhered to in order to balance repetitive consumption. A government division would therefore be created with the sole intent of destroying goods which have 'expired' in order to facilitate a constant demand for the new goods being created, thus safeguarding employment. For example: *“...the life of an automobile shall not be more than 5 years, or the life of this building shall not last more than 25 years...”*^[14]

The government’s control over possessions was however a central point to Aldous Huxley’s seminal *Brave New World*, released the same year. It is unclear who borrowed from who, or if it is a happy coincidence, but the authors are at opposite ends of the spectrum in their opinions of a world where governments enforce dates of obsolescence upon property in order to safeguard consumption. As Huxley wrote:

“We haven’t any use for old things here.”

“Even when they’re beautiful?”

“Particularly when they’re beautiful. Beauty’s attractive, and we don’t want people to be attracted by old things. We want them to like new ones.”^[15]

The world portrayed by London did not catch on, whether this was because of the similarities to Huxley’s dystopia, or if the ideas were discredited on their own merits is unknown. But obsolescence none the less had one more trick up its sleeve, and it would not be a trick discussed casually around the dinner table.

While appearing in litigation some years after the depression, a memo from American corporation General Electric emerged. The 1932 memo discusses, in substantial detail, the conscious efforts put in place by their research division to deliberately shorten product lifespans. Crucially, the memo also details collusion with other businesses in order to ensure that this approach did not result in unwanted competition:

“Two or three years ago we proposed a reduction in the life of flashlight lamps from the old basis on which one lamp was supposed to outlast three batteries.... Some time ago, the battery manufacturers went part way with us and accepted lamps of two battery lives instead of three. This has worked out very satisfactorily.”^[16]

Granted, the memo does not name this process as planned obsolescence, but the actions are clearly in line with the definition specified earlier in the chapter. This approach is different to the planned obsolescence concept as proposed by London, but entirely in keeping with the consumer engineering approach of Sheldon and Aren. The core difference is that this approach occurs behind smoke and mirrors, and is magnified through collusion with other firms.

This broad approach marked the way forward, and such practises continued into the fifties and sixties, propagating into just about all categories of products. Before 1960, men’s clothing had a life cycle of about 5 to 7 years, by the end of the 1960s, fashion firms were targeting men increasingly viciously. Menswear writer Leonard Sloan wrote in the New York Times that: *“This trend towards obsolescence... is largely why the industry had record retail sales of \$17.7 billion last year. And all indications point to more... high fashion merchandise with a short lifespan in the future.”^[17]*

Continuing on into the seventies and eighties, the competitive obsolescence of computer systems and microchip processing brought about a new malady: e-waste. Laced with exotic and dangerous materials, dubbed Permanent Biological

Toxins (PBTs) such as arsenic, beryllium, cadmium, nickel and lead, this mountain of e-waste has only surged skywards through rampant technological obsolescence. But a lack of proper management surrounding technological progress is not solely to blame here, as the perceived obsolescence of the new wave of 'trendy' consumer electronics has further exacerbated this wastefulness.

In 2001, the Silicon Valley Toxics Coalition estimated 5 to 7 million tonnes of e-waste would enter landfills, compared to 1.8 million tonnes the previous year. In 2002, over 130 million functional mobile phones were retired, with only a fraction of these being disassembled or recycled^[18]. When confronted with numbers like these, the ramifications of this repetitive consumption game become clear.

The Cultural Backlash

Despite the tactics employed either to hide obsolescence from view, or to sell it as a positive economic practise, the population did not entirely welcome repetitive consumption with open arms. Over the decades, numerous influential characters from all walks of life have spoken out to condemn this trend towards unreliability and fickleness.

Perhaps the most poignant and tragic tale of the clash between traditional and consumer worldviews occurred in the 1920s, during the advent of the affordable motor car. Henry Ford, A merican entrepreneur extraordinaire, and protégé of the great inventor Thomas Edison had seen great success with his Model T car, with a staggering 55% of American families owning one. Henry Ford saw his car as a great social leveller, and a symbol of American classlessness. The Model T was unparalleled technically, and its rugged design allowed it to run for 8 years on average, 2 full years longer than most other automobiles of the time. This ruggedness and honest engineering promoted by Ford won the car a tremendous brand loyalty amongst customers^[19].

Meanwhile General Motors, Ford's largest rival, lay in tatters. With Ford dominating the market, GM was frantic to dethrone the Model T from its seemingly insurmountable market share. Attempts had been made to use high tech, copper cooled engines in their line of Chevrolet cars, but the venture was plagued with complaints of poor functionality. Electric starter motors were introduced to supersede the hand cranked Model T, but this too failed to break the back of Ford's lead. It seemed that competing with Ford on the technical playing field wasn't working^[20].

General Motors CEO, Pierre DuPont had cut his teeth as a chemical engineer, and had made minor headway in creating a chemical dye that was durable enough to use on automobiles. This allowed the production of exciting new paint colours, in contrast to the often muted tones of car bodywork at the time. In the 1920s, MIT educated genius Alfred Sloan took the reins at General Motors, and for a short period attempted to fight Ford via quality and technology, a route which ultimately failed.

Sloan however quickly adopted a more cunning tact, and built upon the foundations laid by his predecessor DuPont. Sloan saw that style could date cars far quicker than technology. He reworked the ailing Chevy and instructed engineers to remodel the body work. The '23 Chevy was sleek, with elegant low lines, and instantly sparked the attention of the consumer base. The 1920s saw General Motors shift their focus from out-engineering Ford, and towards installing quirks and creature comforts in their products, such as interior lights and upholstery^[21].

This approach was of little surprise to Ford, who vehemently stuck to his guns. Ford's business model relied upon manipulating economies of scale to compensate for lesser consumption brought about by the car's reliability. His tactics were however a victim of his own success, as with 55% of the American population owning a Model T, his economy of scale eventually reached a ceiling defined by the lifespan of his product. Ford however still outright refused to adopt the incremental stylised design changes a la General Motors. He stated:

"It is considered good manufacturing practise, and not bad ethics, occasionally to change designs so that old models will become obsolete and new ones will have the chance to be bought.... We have been told... that this is clever business, that the object of business ought to be to get people to buy frequently and that it is bad business to make anything that will last forever, because once a man is sold he will not buy again. Our principle of business is precisely to the contrary. We cannot conceive how to serve the consumer unless we can make for him something that, so far as we can provide, will last forever."^[22]

Ford's refusal to incorporate obsolescence did not hurt him in the short term, as the Model T remained the workhorse of rural American life, but the car gradually became more and more of a joke under an increasingly fashion conscious paradigm, despite maintaining greater reliability than any non-luxury car. The Model T became viewed as an ugly symbol of low status, and Ford's sales began to decline despite ever more fervent advertising campaigns.

The era also saw other companies coming onto the scene, bolstered by the ideals of perceived obsolescence. There was increasingly aggressive marketing of cars to women, portraying them as fashionable accessories which come and go with trends, rather than mechanically reliable utilities. The 1918 Jordan Sports Marine became the first car to be specifically marketed to women, and emphasised colour as the most important aspect. As Edward S Jordan hinted in 1917, men choose cars as mechanical utilities, while “...women choose them [with a] quick glance at the body... catching the appeal of a striking colour.”^[23]

By the mid 1920s, Ford’s market share dwindled to 30%. Something had to give, and the stubborn entrepreneur realised that he had to change his ways. Ford capitulated and began changing aspects of the Model T. In 1924 he implemented minor body style changes and in 1925 he offered the car in new colours. By this time however it was too late, and the public perception of the Model T had descended into comedy, with Ford desperately publishing diatribes in the media in the hope of defending his vehicle^[24].

Sloan forged ahead unabated, knowing that the Model T was already perceived as obsolete, he focused on deliberately outdating older cars made by General Motors themselves. Sloan created a division of GM dedicated to styling, the first of its kind in the world. This department focused efforts on colour changes, minor additions and superficial alterations to otherwise unchanged vehicles. Sloan implemented new colours via dyes every three years, and began a cycle of minor changes to chroming and aesthetic features every year^[25].

Sloan hired Harley Earl, a custom car designer, who would create flowing bodywork lines out of clay to apply to new or existing models. His designs were sleek and with low wheel clearance, despite the poor reliability of such a design on America’s generally unmade roads. Years later, in 1955, Earl discussed obsolescence and his role as an aesthetically driven car designer: “*Our big job is to hasten obsolescence. In 1934 the average car ownership span was 5 years; now it is 2 years. When it is 1 year we will have a perfect score*”^[26]

However, the automobile industry had not heard the last from its chief sceptic of obsolescence. Henry Ford, after licking his wounds and extensively retooling his factories, returned to the scene with the Model A in 1927. The Model A was stylish, affordable and ruggedly built, naturally becoming an overnight success. However it quickly became apparent that Ford still didn’t quite get it. Despite having his Model T routed from the marketplace based upon its static design and exceptionally long lifespan, Ford still lauded his new automobile as being “*so strong and so well-made that no one ought ever to have to buy a second one.*”^[27]

Needless to say, the excitement wore off fairly quickly, and after a burst of initial sales, decline set in as quickly as 1930. Ford repeated his simple style changes to provoke repetitive consumption as per the Model T in 1924, but this was not enough to revive the Model A. In 1933, Ford begrudgingly accepted the way of things to come, and began to change design every year. Rapid obsolescence had won against durability, and it was here to stay. J. George Frederick stated that: “*Even Ford was forced to bow before the god of obsolescence.*”^[28]

Resistance against obsolescence flared up again in the late 1950s, encouraged by the release of Vance Packard’s *Hidden Persuaders*, which popularised the idea of manipulation in advertising. The economic downturn in the United States dampened spirits, and inclinations began to shift away from the vapid, ever changing fashions and toward the rugged and reliable once again.

Industrial designers and engineers also clamoured to denounce planned and perceived obsolescence. E. S. Stafford, editor of *Design News Magazine* voiced his surprise that radio manufacturers openly discussed truncating product lifespans in 1958: “*It is of remarkable interest to learn from a highly placed engineer in a prominent portable radio manufacturing company that his product is design to last not more than three years.*”^[29]

Fierce and mostly negative discussion of the phenomenon clogged the three following issues, including letters of anger from many readers. However, after stern words in defence of 'death-dating' from G. J. Alaback - a senior manager at appliance manufacturer and corporate sponsor, Whirlpool - the magazine unsurprisingly came down in favour of such practises^[30].

Brooks Stevens, industrial designer and leading apologist for obsolescence implored the public to support designers in promoting continual consumption during a 1958 interview with *True Magazine*:

“Our whole economy is based on planned obsolescence and everybody who can read without moving his lips should know it by now. We make good products, we induce people to buy them, and then we deliberately introduce something that will make those products look old fashioned, out of date, obsolete. We do this for the soundest reason: to make money.”^[31]

Apologetics for the practise however did not work, and the public remained unconvinced. In the same year, *Design News Magazine* craftily circumvented the

glaring eyes of their corporate sponsors by allowing a guest editorial by engineer Jack Waldheim. Despite copious disclaimers labelling the article as an opinion piece, the message was clear:

“Planned obsolescence is the deliberate attempt to have something break down or become outdated long before it has lost its usefulness – its utility – or its value!... Its danger to the customer is that it cheats him out of his hard earned money, though he may not realise it in the beginning.”^[32]

The public heeded the call, and in 1959, amid the ridiculousness of ever changing tailfins in the American car market, sales of humble Volkswagens soared. VW took advantage of the anti-obsolescence climate, and cleverly tailored their advertising to suit.

Many advertisements for the cheap and reliable German car penetrated the American market in the 1960s, amongst them, a 1961 advert displayed a picture of the car, with the caption *“The ’51, ’52, ’53, ’54, ’55, ’56, ’57, ’58, ’59, ’60 and ’61 Volkswagen.”* Another, bold full page magazine advert comically contained nothing but blank space and the phrase *“We don’t have anything to show you in our new models.”* Bolder still, another 1961 advertisement displayed two identical cars, (the ’60 and the ’61) asking cheekily *“Can you see the changes?”* The same advert went on to insist that: *“The yearly model change must go!”^{[33][34]}*

While the swing in opinion against obsolescence may seem to be a victory against coercive enforced cyclical consumption and a testament to the self correcting marketplace, the truth is that Volkswagen were simply appealing to counterculture in order to achieve exactly the same ends as their competitors. Through equally clever and coercive advertising, Volkswagen were, in essence, making obsolescence obsolete, and promoting a new fashion of frugality in order to encourage consumption of their more rugged vehicle.

The consumers discarded their unfashionably fashionable cars (no doubt before they needed to), and flocked to consume the new trend. In time, when prosperity returned, obsolescence and ever changing fashions would enter the fray again, and render reliability obsolete as it did in the 1920s, thus setting in motion an ever shifting marketplace of constant consumption, under whatever banner is suitable at the given time.

On the Side of Problems and Irrelevance

The need for continued cyclical consumption has further implications than the exploitation of the consumer's most basal aesthetic desires. While cultural backlashes emerged against such practises, there is a lesser cultural understanding surrounding the more insidious and damaging upshot of cyclical consumption.

As established in the initial discussions of this chapter, cyclical consumption emerges from a set of needs which require (or desire) fulfilment. In more direct terms, we may deem the need a 'problem' and the product or service generated to meet this need as a 'solution'. Again, this is often sung as a glory of the capitalist system; that the system actively rewards individuals or businesses who deliver solutions to social problems, with the level of reward correlated by how pervasive the problem is.

However, this is a particularly naive viewpoint, as it is a linear, single instance representation of something which is inherently repetitive. The optimum solution for a problem is obviously the solution which offers the greatest amount of closure and finality; that is, the solution is so successful that the problem becomes an irrelevance.

Within a cyclical consumption economy, there is a salient disconnect between the optimum reality and the optimum economic solution. A total solution which renders a problem instantly irrelevant lacks the repetitive cyclic element to retain profitability in the long term. As such, the incentive system becomes skewed toward encouraging solutions which are piecemeal, ongoing and incomplete.

This has a series of far reaching ramifications. The underlying problem is not actually solved, it is rather serviced in order to retain repetitive profitability. The economic system therefore actively *requires* long term problems in order to function. A venture is deemed worthy of pursuit based on the capacity for repetitive consumption, rather than any real objective to solve, improve or implement any real world solution permanently.

Nowhere is this better demonstrated than in the private prison industry. The USA has become a beacon to the world in this regard, with around 25% of the world's prison population in American jails. Since 1984, when the Corrections Corporation of America was contracted to run its first prison, the scope of private prisons run for profit in the USA has increased dramatically, with the industry now being worth billions of dollars^{[36][38]}.

Alongside this rise in the private prison, incarceration rates have skyrocketed (see Figure 1.2-4). Theoretically, in the view of the market incentive, this represents the solution to a problem that society has been presented with, i.e. crime being solved with prison. However, if we look closer at the data, recidivism rates in the early 2000's stood at nearly 70%^[35].

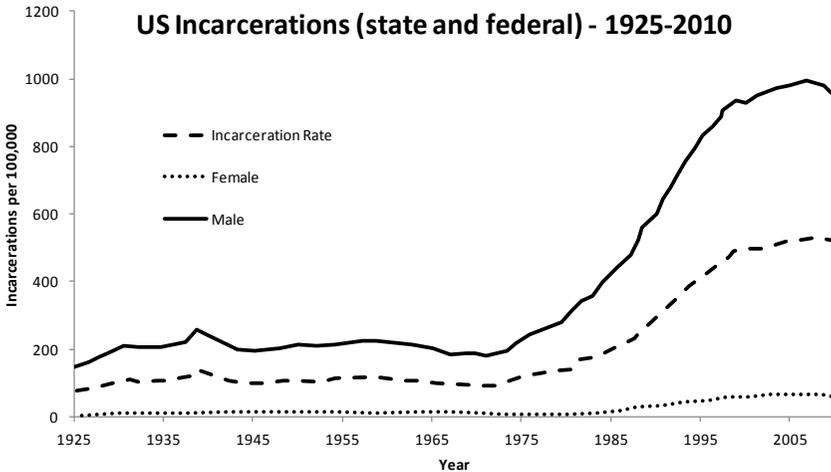


Figure 1.2-4: Incarcerations per 100,000 in the USA (combined state and federal figures - local Jail figures omitted) - Years 1925 to 2010. Data Sourced from [37]

This illustration clearly shows that rather than solving the issue, the market incentive has driven private companies to service a problem. This is however perfectly in keeping with the values encouraged by the marketplace. If crime were to be magically solved tomorrow somehow, then a \$5 billion industry would collapse overnight, along with the loss of jobs and redundancy of infrastructure.

A further property of this incentive to service problems rather than solve them, arises from the wide economic diversity of potential problems that exist. Across the economic spectrum, there is a significant discrepancy in both quality of life and inherent purchasing power. Those in the middle class of the Western world will have a different collection of problems than those in rural sub-Saharan Africa, and by most measures, they will be generally be more trivial. However, the Western individuals possess hundreds, or even thousands of times the purchasing power of their African counterparts.

As such, despite the problems experienced by those in the West being of less critical importance, there is substantially more economic impetus to service these problems than those in the developing world. The economic incentive structure is therefore further skewed toward solutions for problems which are largely irrelevant in the scope of social benefit.

Billionaire and part time philanthropist Bill Gates has discussed this concept in the context of his work with vaccinations in the developing world. While few would argue against the moralistic and functional value in reducing disease amongst our poorest countries, Gates presented the argument that the developing world has a much quieter 'economic voice'^[39].

Gates illustrates this by comparing dollar-for-dollar global spend on 'cures' for male baldness versus that spent on vaccination against malaria. Unsurprisingly, the economic market considers male baldness to be a more crucial problem than malaria, and thus this field sees much greater investment. In general this is in keeping with the themes discussed here. The relative irrelevance of male pattern baldness in comparison to malaria is obvious, but economically, servicing prosperous and image conscious individuals with temporary measures against baldness is a more lucrative venture than a total eradication of malaria.

Of Wastage and Perpetuity

A brief mention has been made of the incredible wastage generated by the new phenomenon of consumer electronics, and more discussion of this irresponsible squandering of resources is provided in chapter 1.11. However, first it seems timely to examine how a pattern of cyclical consumption, or more aptly, an economy which requires cyclical consumption is systemically at odds with resource efficiency.

Perceived and planned obsolescence are a banality here, as wastage that is created by these practises is obvious from their historic usage as shown in the previous subsections. The disposability and artificial obsolescence principles of economic thought which dominated the late 19th and early 20th centuries were only able to prosper after the demise of any form of frugal or conservative culture. However, the more ambiguous and progressive phenomenon of technological obsolescence is one which deserves additional scrutiny here.

It is of no surprise that human ingenuity has brought about magnificent technological creations, and will likely continue to do so into the future. This progression towards more advanced goods brings about obsolescence in its most

benign form, as technological advancement renders previous devices obsolete before they may be functionally useless.

Due to humanity's curiosity and desire to explore and unravel, we may assume at this point that this variety of obsolescence that is caused by technological progress, is pretty much a given. Our scrutiny in this case therefore shifts from how to minimise harmful artificial obsolescence (perceived and planned) to how to best deal with the side-effects of this healthy obsolescence.

We must therefore pose the question: does a system of cyclic consumption effectively deal with the problems caused by technological advancement? The answer to this question is difficult, as for starters, the whole system came about through the technological breakthrough that allowed overproduction to become reality.

This however does not deem the system adequate, as though consumption thrives upon and thus encourages technological progress, this progress comes with a significant cost; massive amounts of waste. I will not dwell on the details of resource depletion as a result of market economics, as this is the specific point of discussion for a later chapter. What must however be discussed, is how technological obsolescence leads to waste under our current model.

Free from economic incentives, we can see that designing goods to be upgradeable and compatible with developing technologies is probably the most sensible use of resources, particularly in the technologically ascendant domain of electronics. The modern influx of 3D capable televisions will essentially come to render HD televisions obsolete, and destined for the trash in time, despite the fact that the only difference between the two is simply a matter of image processing capability.

The most sensible approach to this obvious impending technological obsolescence would seem to be a simple upgrade program, whereby the fully functional aspects of HDTVs could be preserved and a device installed to decode the new 3D composite image signals. However, with the profit motive firmly taking this deal off the table for manufacturers able to develop such technologies, the fate of HDTV seems ominously similar to the CRT machines which litter our landfills, being superseded by full new units at full new television costs, rather than upgrades.

This trend is echoed elsewhere, with the consumer electronics industry in particular exploiting technological advances as an opportunity to launch entirely

new models with only minor software or processing power advantages over predecessors. It is therefore not entirely surprising that a study by Tim Cooper and Kieran Mayers gleaned that of all electrical appliances sent to landfill, 30% were fully functional^[40].

Obviously, upgradeability cannot be perpetually in line with technology, as there will occasionally come advances which will revolutionise the functionality of products, the touch screen supplanting the keypad in mobile phones as a current example. None-the-less, upgradeability is of paramount importance in liberating the maximum value from resources, and is an approach which is largely discouraged by market incentives, as it falls short of the possible repetitive consumption capacity.

Technological progress, with all its benefits, becomes little more than an auxiliary method to trigger consumption under this system. This is echoed in the fact that technologies which do not contribute to consumption are not capitalised upon, as there is little incentive to do so.

Reconciling Consumption with Sustainability

We must however be careful not to tar market dynamics with what is currently the case in our economic system. Repetitive consumption may not be aligned with resource efficiency currently, but it is a wildly different assertion to say that they are inherently incompatible. Can repetitive consumption be aligned with resource efficiency on a theoretical basis?

A possible point of reconciliation between efficient resource usage and constant consumption is the option of leasing. Leasing alters the financial incentives in play as the customer in essence pays for usage of the utility per unit time. The objective of the producer therefore becomes to keep the item in service for as long as possible, rather than a mentality geared towards selling and obsolescence. Leasing has seen popularity amongst numerous sectors of the economy, with typically 20% of new cars in the UK and U.S. being leases, and leasing options being very popular in other large expenditure fields, such as shipping and commercial aeroplane.

A lease based, pay-to-use market economy however enters somewhat choppy waters when we come across items which are difficult to develop a lease system for. Items which have arisen through the disposability revolution of the late 19th century, such as countless sundries, would still be reliant on a cycle of consumption, and where there is such a cycle, wastage inevitably follows.

This however is no major obstacle to a more resource efficient economy, as any improvement from the current state is an improvement none the less. Certainly there are a great many options for ingenious leasing ideas within the market incentive, and I do not hesitate in promoting an economy where everything that can be leased is, but this approach is not a total solution by any means.

For example, a lease dominated market runs into significant difficulty when we broach the growth aspect of the modern economy, which has not been considered within this assessment of the consumption cycle. As we will discover later, growth is essentially mandatory in this system for a variety of complex reasons.

As with conventional consumption, under a growth paradigm, the number of items or leases sold must increase each successive year. This leads to a situation where production and sale of goods must also accelerate year upon year. A primarily lease based economy struggles to provide demand for this year on year growth in income, as Henry Ford found out in 1924, when producing goods to last (or leases to last), market share can at best only reach a saturation point determined by the lifespan of the contract or product. After this point, growth becomes very difficult while still operating on the principle of reliability and longevity.

Leasing thus allows a stable cycle of consumption based upon market incentive in some areas of trading, but is severely limited in creating an economy where growth can be readily obtained. As such, the burning necessity for growth lashes the hands of businesses back to the grindstone of artificial obsolescence, as this approach is far more conducive. This disincentive towards longevity is a less obvious one, and leasing can no doubt bring some efficiency benefits to the table, but it is not a solution in its own right, and would have to be accompanied by considerable monetary reform in order to become viable.

But what of recycling? Surely there exist few more lucrative venture of repetitive consumption than recycling, which in essence thrives upon what is wasted. To a forward thinking entrepreneur, surely a world which indulges in such repetitive wastage is nothing short of a cornucopia. Recycling has however not quite become the theoretical goldmine that it ought to be under this system. The reason for this is highly complex and multi-faceted, but it lies in both the dynamics of the market system itself, and in the consumers that exist to support it.

Firstly for a product to be easily recycled, it must be to some extent designed with recycling in mind. For strictly functional items (such as aircraft, which see large proportions of their airframes recycled) this is fairly straightforward, as form follows function. However, for aesthetically geared products which constitute the primary engine of perceived obsolescence, design for recycling becomes very much a trade-off.

Operating under the incentives of a marketplace, a manufacturer has no real economic reward for expending the effort to make a product which can be readily recycled, as beyond the sale, most everyday goods are simply not of interest to the producer. Budget goods are subject to particularly tight compromises, and when weighing up the design and production costs of a low price item, the significant effort to apportion additional resource to design for recycling is something which is often not high on the list of priorities.

The post-sale disconnect is directly linked to the individualist notions of value that the market encourages. Ultimately, the producer does not care if his product is or isn't recycled, as he gains no value from it.

As such, indifference to recyclability is something which pervades many aspect of product development, including the role played by packaging. Disposable packaging as we know it arose during the late 19th century, previous to which packaging was seen as dubious, as it inhibited sampling or examining the product therein.

With the rise of branding, consumers became more trusting of the quality guaranteed by a good brand name, thus branded packaging superseded the traditional sampling and testing culture. Effective packaging became the difference between a success and a flop, and naturally retailers would adopt any approaches available to further repetitive consumption.

The upshot of this is that seemingly harmless usage of packaging at the producer's end of the spectrum has made the task at the recycling end much tougher. Take for instance the ubiquitous Tetra Pak carton, which for many will probably be synonymous with fruit juice of some form.

The producers of beverages can't get enough of the Tetra Pak, as its innards are lined with a thin film of metal, rendering it ruggedly waterproof, while its outside is coated in a full printable facade of paper to receive as much branding as desired. Even more impressively, the paper outer shell is then laminated with plastic to give the carton a quality sheen. Now this may all be good news for the

businesses involved, but in becoming so receptive and uncompromisingly geared toward branding, the Tetra Pak has presented itself as a nightmare to recycle^[41].

This is not limited to the beverage industry, as wherever we look, we can see other 'composite' packaging, for example combining cardboard with clear plastic to allow a glimpse at the contents, while simultaneously displaying a logo or image. Such packages are equally difficult to recycle and come into existence based upon similar economic single-mindedness on the part of the producer.

Blame does not however solely rest on the shoulders of the producers in this system, as the consumer is equally resistive to recycling. Again, to address why this has been the case, we must return to the individualistic notions put forth by this economic incentive system. What is there for a person to gain economically from recycling?

The dispersed and varied nature of production as outlined previously necessitates that there are a plethora of different materials making their way through consumer households, often combined together in complex ways. This requires the consumer to actively sort, and partially disassemble items, in order to get them into any state fit for recycling. In the absence of a moral sense of duty, the consumer is afforded no impetus to do this additional task.

This intrinsically anti-economic impetus also must come into existence in a climate of disposability and obsolescence, where consumers are encouraged to impetuously replace mobile phones every 12 months, while simultaneously sorting through their waste for recyclables; to accumulate pristine clothes each season based on the new fashions, but to brave the stench of rotting food in their kitchen waste receptacle. Consumers are being encouraged to be two things at once; both custodians of long term frugality and sustainability, but also rampantly vapid and short sighted neophiliacs.

But are these problems really insurmountable? Certainly not, and proponents of the self-regulating marketplace will agree. Recycling has made tremendous progress from its inception, and looks to only increase into the future with improving technologies. Similarly, a combination of government programs and a culture increasingly critical of consumption have made consumer recycling less of a contradiction in terms.

However, even in an ideal situation, where we became able to successfully recycle all that we make, would repetitive consumption be any less of a

foolhardy and ridiculous system? Even in a world where we were somehow able to recycle 100% of our resources, in spite of any disincentives and hurdles put in the way by the market economy, we would still live in a world which is profoundly wasteful of energy.

In 2009, 30% of the energy consumed by the USA was through industry, of which a significant proportion was dedicated to intensive metal production, such as steel and aluminium. This included smelting of recycled and reclaimed scrap metals. Similarly, transport consumed 29% of energy, of which approximately a third was industrial and commercial freight, constituting the transport of products and raw materials^[42].

Energy Usage in the USA - 2009

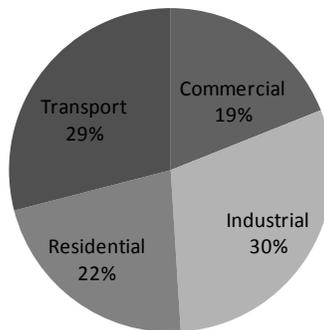


Figure 1.2-5: Chart showing breakdown of U.S. energy usage in 2009. Pie chart produced by author using data from [42]

It is clear that a repetitively consuming society is wasteful of energy, regardless of whatever leaps and bounds can be made in recycling. Industrial production and distribution is an incredibly energy intensive sector of our economy, and needlessly repeating these processes ad nauseum is ill-advise when faced with an impending energy crisis.

Furthermore, increased recycling throughput while maintaining similarly high rates of consumption will likely only exacerbate energy woes, as new breakthrough recycling technologies are equally enslaved by their energy footprints. No matter what concessions are made to defend this system, the repetitive construction and disassembly of products to safeguard waged labour will simply never make sense as a beneficial technical practise, and will never foster a world which is resource or energy efficient in any way.

A further implication of this system of consumption, again regardless of how effective our use of resources may become, is the consequences for us as a society, and how the apotheosis of consumer goods has ravaged human culture, interpersonal relations and social cohesion. I will not dwell on this point for any great length here, as it will become the topic of the following chapter, but the psychological and psychosocial effects of repetitive consumption have been generally very negative, and this will likely not change as a result of any theoretic breakthrough in consumption efficiency.

Conclusion

As stated during the initial section of the chapter, the collective irrationality of a discrete rational incentive - in this case to coax people to buy a little more often - is shockingly apparent. Considering that this behavioural model finds its roots in technological progress, and an unparalleled overproduction of goods, can it be said that this method of compensation is an effective use of the aforementioned overproduction?

Can it be said that reproducing and reselling products in perpetuity, with decreased functional or perceived lifespans is really the best technical solution to a world able to produce too much? The answer to this question seems obvious when we look at the disparity in access to goods between the Western world and other nations.

This convoluted and flawed method of economy has put immense strain on our future ability to produce anything at all, due to its insatiable desire to consume resources with such little inbuilt concern. I am not being unfair here, as this system in its most efficient theoretical form is still woefully inept at delivering any form of labour or energy efficiency. It demands constant employment, constant production, constant distribution and constant purchasing in order to function, a set of demands which cannot be considered efficient, logical or beneficial in any way.

However what we must come to realise is that this grossly nonsensical system is entirely a result of the market incentive. It finds its collective roots in the incredibly simple and economically rational act of attempting to increase sales. As we will see much later in the book, this collective irrationality stemming from discrete rational choices is something which is fully understood in the science of game theory. It is however a discovery which has lamentably not been extrapolated to our convoluted economic system of consumption.

It becomes difficult to be anything other than polemic when faced with a system that is so clearly void of any logic at a macroscopic scale, and stands steadfast in complete contradiction to the evidence of its failings; a culturally bankrupt consumer society, an ailing environment and dissonant scientific literature.

There is sadly little more to conclude here, as it becomes difficult in a balanced argument to put forward anything entirely positive for a system of cyclic consumption. Yes, technological progress is encouraged and highly prized under this system, but only where obsolescence and thus consumption can be exploited.

Technologies which do not align with this ideal of repetitive consumption are passively discouraged, and their benefits superseded by other products regardless of their relevance to human well being or prosperity. Leasing and recycling offer possible increases in resource efficiency, but these approaches too are passively discouraged by market dynamics and the cultures which are fostered therein. If these hurdles did not exist, then surely the market would have already settled upon these approaches of optimum efficiency long ago.

The cycle of consumption is ultimately an unsustainable ideology which has had severe implications for resource depletion and the environment. For more information on these phenomena, see chapters 1.10 and 1.11.

For now, it is abundantly clear that the consumption system of economy set in motion by the market incentive is one which is damaging, but we will hover over this point for one further chapter. This is because the cultural and societal ramifications of consumption, and particularly perceived obsolescence are of merit, and worthy of a chapter themselves.

Chapter 1.2 - References and Notes

- [1]. King Camp Gillette, *The People's Corporation*, New York: Boni & Liveright, 1924, pg 237.
- [2]. Tim Dowling, *Inventor of The Popular Culture: King Camp Gillette, 1855-1932*, London: Short Books 2001, pg 20.
- [3]. *Production and Consumption*, U.S. Economist and Dry Goods Reporter, May 6, 1876, pg 7.
- [4]. Giles Slade, *Made to Break*, Harvard University Press, 2006, pg 13
- [5]. Amy K. Glasmeier, *Manufacturing Time: Global Competition in the Watch Industry, 1795-2000*, London: Guildford, 2000, pg 121
- [6]. David Wallechinsky; *Irving Wallace (1975). The People's Almanac.* Knopf Doubleday Publishing Group.
- [7]. Giles Slade, *Made to Break*, Harvard University Press, 2006, pp 19-23
- [8]. Thomas Nixon Carver, *War Thrift; Preliminary Economic Studies of the War*, Vol 10, 1919, pg 23
- [9]. Paul M. Mazur, *American Prosperity: Its Causes and Consequences*, Jonathan Cape 1928, Pg 98
- [10]. J. George Frederick, *Is Progressive Obsolescence the Path Towards Increased Consumption?* Advertising and Selling, 11, no 10, 5th Sept 1928.
- [11]. Christine M. Frederick, *Selling Mrs Consumer* (New York: Business Bourse, 1929, pg 245
- [12]. Henry Elsner Jr. *The Technocrats: Prophets of Automation*, Syracuse: Syracuse University Press, 1967, pp 7-11
- [13]. Roy Sheldon; Egmont Arens, *Consumer Engineering: A New Technique for Prosperity*, New York: Harper and Brothers, 1932, pg 13
- [14]. Bernard London, *Ending the Depression Through Planned Obsolescence*, New York: Self Published, 1932 (Cited in Slade, *Made To Break*, pg 74)
- [15]. Aldous Huxley, *Brave New World*, Harmondsworth: Penguin, 1959, pg 49
- [16]. Letter from L.C. Porter to M.I. Sloan, 1st November 1932, *U.S. vs. G.E. Civil Action No. 1364 Ex. 1860-G* (Quoted from George W. Stocking; Myron W. Watkins, *Cartels in Action: Case Studies in International Business Diplomacy*, New York: Twentieth Century Fund, 1946)

- [17]. Thomas Frank, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism*, Chicago, University of Chicago Press, 1997) Pg 143
- [18]. Silicon Valley Toxics Coalition, *Poison PCs and Toxic TVs: California's Biggest Environmental Crisis that You've Never Heard of*, San Jose, 2001
- [19]. Giles Slade, *Made to Break*, Harvard University Press, 2006, pp30-32
- [20]. Stuart W. Leslie, *Boss Kettering*, New York: Columbia University Press, 1983, pg 138
- [21]. David Gartman, *Auto Opium: A Social History of American Automobile Design*, London, Routledge, 1994, p 75
- [22]. Henry Ford, *My Life and Times*, New York: Macmillan, 1922, pg59
- [23]. Janice Williams Rutherford, *Selling Mrs. Consumer: Christine Frederick and the Rise of Household Efficiency*, Athens, University of Georgia Press, 2003, p.31
- [24]. James C. Young, *Ford to Fight it Out with His Old Car*, New York Times, 26th December 1926
- [25]. Alfred P. Sloan Jr. *Alfred Sloan on the Future of the Automobile*, Printer's Ink, 3rd May 1928.
- [26]. Jane Fiske Mitarachi, *Harley Earl and his Product: The Styling Section*. Industrial Design 2, October 1955.
- [27]. Chicago Tribune, 1st December 1927, pg9
- [28]. Louis L. Sullivan, *Autobiography of an Idea*, New York: Dover 1924, pg329
- [29]. E.S Stafford, *Product Death Dates - A Desirable Concept?* Design News, 13, no 24, 24th November 1958
- [30]. Harold L. Chambers, Design News, 14, no 2, 19th January 1959, quoted in Giles Slade, *Made to Break*, Harvard University Press 2006, pp167-168
- [31]. Karl Prentiss, *Brook Stevens: He Has Designs on Your Dough*, True: The Man's Magazine, April 1958. Cited in Glenn Adamson, *Industrial Strength Design How Brook Stevens Changed Your World*, Cambridge: MIT Press 2003, pg 145
- [32]. Jack Waldheim, *Lollypops and Faucets*, Design News 4, no 3, 2nd February 1959
- [33]. Advertisements cited in Giles Slade, *Made to Break*, Harvard University Press 2006, pp174-175
- [34]. Advertisements cited in Thomas Frank, *The Conquest of Cool: Business Culture, Counterculture, and the Rise of Hip Consumerism*, Chicago, University of Chicago Press, 1997

- [35]. Patrick A. Langan, David J. Levin, *Recidivism of Prisoners Released in 1994*. Bureau of Justice Statistics, June 2, 2002.
- [36]. The Sentencing Project, *Prison Privatization and the Use of Incarceration*, 2004
- [37]. Data taken from: Bureau of Justice Statistics - Key facts at a Glance - http://www.bjs.gov/glance_redirect.cfm, and, Sourcebook of Criminal Justice Statistics - University of Albany - <http://www.albany.edu/sourcebook/>
- [38]. Good Jobs First, *Jail Breaks: Economic Development Subsidies Given to Private Prisons*, October 2001, pg. 2
- [39]. Dean Van Nguyen, *Former Microsoft boss Bill Gates wants to end malaria*, Silicon Republic - <https://www.siliconrepublic.com/earth-science/2014/11/03/former-microsoft-boss-bill-gates-wants-to-end-malaria>
- [40]. Tim Cooper; Kieren Mayers, *Prospects for Household Appliances*, E-SCOPE 2006
- [41]. Philip Fleischer, *Tetra-Pak: an Environmental Charade?* Peace and Environment News, October 1991
- [42]. Data taken from U.S. Energy Information Administration, <http://www.eia.gov>

1.3 The Culture of Consumption

WHILE THE EFFECT OF A CYCLICAL economic engine upon our society is threatening at a technical level, equally profound is the effect upon our culture. The nature of repetitive consumption is contingent upon the balance of industrial supply and consumer demand. At a minimum, this single criterion must be met in order to facilitate consumption on a large and sustained scale. It is simply no good to produce goods geared for repetitive consumption if the populace enshrines frugality.

As such, the modern edifice of perceived obsolescence demands a culture which is receptive to such processes, if the circularity of modern market economics is to remain. Consumerism is the somewhat innocuous sounding word which has come to envelope this collection of bizarre behaviours, and it is this aspect of the cyclical marketplace which will be perused in this chapter.

Clues to Our Focus

It is often interesting to gain some degree of historic scope when assessing the priorities of a culture. Perhaps no such aspect of a society reflects its prerogatives better than the grandeur of its architecture and urban development. The majestic and grandiose cathedrals of the medieval period show the centrality of religious authority to everyday life, while the imposing but elegant warehouses and mills of Victorian Britain underline the power of industry and production which dominated the age.

However, in years to come, a glance back at the most brazen architecture of today may reveal some truths which are uncomfortable to us. For instance, take the Trafford Centre in Manchester, UK; an enormous 207,000m² complex, designed in an absurdly opulent neo-baroque style. The centre features marble and granite flooring at a cost of £5.8 million, and a dome larger than that of St Paul's cathedral in London^[1]. What is the purpose of this colossal building, so audacious in its design? It is a shopping centre. What is perhaps even more

telling of our cultural fixation is the fact that the Trafford Centre is not anything special, and is in fact dwarfed by many other developments around the world.

Beyond the sprawling, bespoke shopping centres, we have witnessed a parallel metamorphosis in our towns and city centres. Cities big and small are increasingly becoming centred on the so called “High Street”, where large scale retailers cluster together into a shopper’s paradise. What will our ancestors think of this I wonder?

The Language of Goods

Within a society, communication is king. It facilitates the concept of societal cohesion, and lubricates the gears of the ongoing process. Communication is a varied beast, and may manifest in a variety of forms, the most obvious of which is the spoken word. Spoken language is however just one entry in a broad portfolio of communicative tools which evolution has kindly bestowed upon us. Body language and tone of voice also play crucial roles in imparting meaning upon people in ways which are perhaps more significant than often realised.

But the process of biological evolution is far from the sole progenitor of our communicative prowess. Recent technological breakthroughs have allowed communication over vast distances, via telephone or the internet. Similarly, social trends, which may or may not be backed by any hard biological prerogatives, may also bring communicative conventions to bear upon society*.

Of these, art, music and fashion are particularly salient cultural phenomena, and they may convey meaning far beyond our basic biological approaches; however this is an aside here. The communicative phenomenon of particular interest to this chapter is one which is arguably as subtle as body language or tone of voice, but not necessarily innate to us. Professor Tim Jackson of the Centre for Environmental Strategy encapsulated this unique mode of communication as ‘the language of goods.’^[2]

It may seem strange, but the communications which we constantly broadcast to society through the goods which we possess are astonishingly profound, and can

* *It often is argued that consumerism and its associated language of goods are ‘unnatural’ cultural processes which are largely manufactured. This is often a difficult statement to make without submitting a rigorous definition of human nature – which in itself is fraught with difficulty. I will not make a definitive statement that such a cultural phenomenon is against our nature, but I will present the evidence that the mindset is one which is largely manufactured in order to safeguard repetitive consumption.*

lead to radically different perceptions of ourselves and each other, particularly when at an early age. A study in the UK by Richard Elliot and Clare Leonard found that within groups of 8 to 12 year old children, the brand of trainers which a child wears hold strong bearing upon their social status within a group. It was found that *“these opinions are so strongly held that the children would prefer to talk to someone wearing branded trainers than unbranded trainers.”*^[3]

The UK National Consumer Council reported in 2005 that children within the same age group had already taken a keen interest in shopping, branding and the current consumer trends amongst their age group.

“Even the youngest in our survey are already keen consumers. Almost eight in ten (78 per cent) 10-12 year olds already say they enjoy shopping. More than two in three like collecting the latest things that others are collecting. Nearly half of 10-12 year olds think that the brand is important when they buy and the average ten year old has internalised 300 to 400 brands.”^[4]

For many, the language of goods has also impinged upon the dynamics of our relationships. Qualitative research by Neal Lawson looked at the importance of branding and fashion styles in youth dating culture on impoverished UK estates. Numerous youths spoke of how the clothing style and the type of mobile phone often had greater bearing upon those deemed attractive than their actual looks or personality. As one of his female interviewees commented; *“it’s not about the face; it’s about the image.”*^[5]

The young are however not alone in their fixation upon the language of goods as a form of communication. The middle and even upper classes are also feeling the pinch of a culture of consumption and materialism. Philosopher Alain de Botton commented upon this trend in his book, *Status Anxiety*, suggesting that while the absolute wealth of the middle classes now far exceeds the absolute wealth of the most decadent medieval monarch, we remain obsessed with our relative wealth amongst our peers^[6]. This wealth is almost exclusively voiced via the language of goods.

The circumstantial arguments for this claim are reinforced through empirical study. Juliet Schor has found that the inflation adjusted incomes of Americans have consistently fallen short of the income they believe they need since as far back as the 1970s^[7].

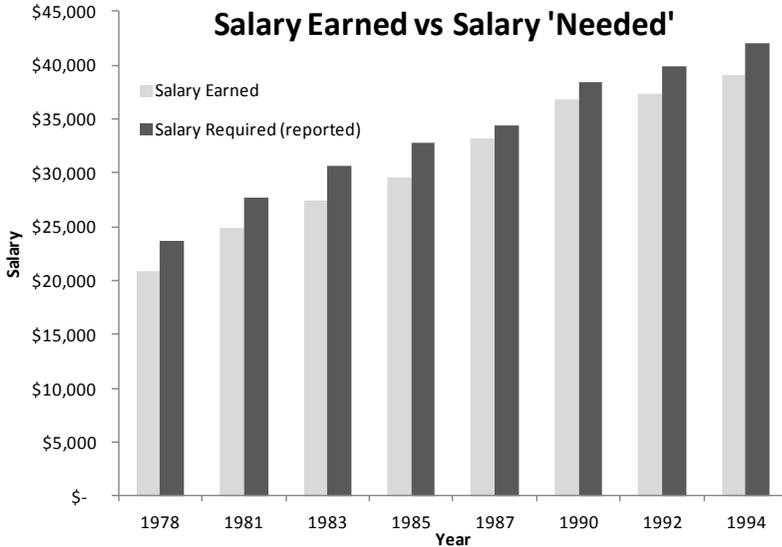


Figure 1.3-1: Graph showing yearly average income of a sample of Americans, compared with average self-reported income that the sample claimed they 'needed' - Adapted by author from [7]

This constant and ongoing dissatisfaction with economic status is directly analogous to the modern market's inherent mechanism of consumption. In essence, the language of goods demands that consumers be dissatisfied to some degree, as a fully satisfied consumer will naturally desire to consume less; this is anathema to a market predicated on perpetual production, perpetual labour and infinite growth.

The underlying mechanism is at least noble to some degree, or may be twisted to become so through political spin. Dissatisfaction with the here and now may be argued to generate positive actions in order to build a better future, while satisfaction may often be conflated with complacency and resting on one's laurels.

For concision, the bulk of the argument against this line of rhetoric is included in chapter 1.8, however I will state here that the scientific consensus surrounding this ingrained dissatisfaction is overwhelmingly to the negative. Similarly, the idea that human beings are encouraged to work harder by contingent materialistic rewards is also bunkum in most cases, as examined in chapter 2.3.

Needless to say, this unspoken language of goods has become ingrained within our society at all levels. The rich are no longer defined by their bank balances,

nor the poor by the food on their table. Instead, the placement of a person in society is dictated by their fluency in the language of goods; their ability to wear the right clothes, drive the right car and live the right lifestyle.

The New Poor

We must be quick to make a distinction between actual poverty, and the stigmas of pseudo-poverty associated with a consumer society. While homelessness and chronic poverty in Western civilisation does exist, it is largely inconsequential to the cultural effects of consumerism. What is of greater significance when assessing consumerism is the effect upon less severely deprived individuals.

These are the kinds of people who are not in any immediate danger of destitution; they have a roof over their head and food on their table, and generally live life in moderate comfort. Their plight is instead found in the social blemish which is attached to those unable to fluently speak in the language of goods.

Sociologist Zygmunt Bauman was the first to coin the term “the flawed consumer” in his book, *Work, Consumerism and the New Poor*. He suggested that poverty of today has a radically different face to pre-consumer poverty. While poverty has been predictably constant in many timeframes, poverty in a society defined by consumers - rather than one defined by producers, craftsmen and citizens - categorically denies the new poor access to normality on all fronts^[8].

The flawed consumer is not poor due to danger of starvation; he is instead poor by his ineptitude at consumption. In our society, consumption retains a monopoly of the access to normality. Social pecking orders are made or broken through the language of goods; relationships and friendships are bought and sold through the exchange of products and activities; self actualisation is sought through the pursuit of hobbies, interests or the career ladder. The flawed consumer is constantly stunted and retarded by these hurdles to social status and well being, and while adequately nourished and suitably comfortable, the flawed consumer is denied access to a life of social normality.

This blockage to many of the rudimentary requirements of a social animal is often written off or downplayed in modern discourse, but as will be examined, the inability of flawed consumers to access these perceived luxuries is intrinsically damaging to both individual and society. Bauman writes;

"Flawed consumers are lonely and feel abandoned, and when they are left lonely for a long time they tend to become loners; they do not see how society can help, they do not hope to be helped, they do not believe that their lot can be changed by anything but football pools or a lottery win."^[8]

In a consumer society, the most severely flawed consumers are the unemployed and underemployed. Unemployment isolates the individual from the central mechanism of consumption, and thus from the sole means of entertainment, socialisation or hobbyism. While this may seem significantly less severe than the ramifications of unemployment in a society with no form of welfare, the effect which this isolation has upon individuals has been extensively investigated by researchers such as Stephen Hutchens^[9], or Peter Kelvin and Joanna Jarrett^[10]. The consensus is that unemployment manifests itself as chronic boredom, depression, irritability and a sense of hopelessness at society's ability to help^[9].

The classical counterpoint to this reality is that such a dreary fate acts as a deterrent and thus spurs the impetus to contribute and work hard; however study has confirmed that this is in fact not the case. A psychological transformation takes place surprisingly early in the tenure of unemployment, in which the individual segues from eagerness to find work to a glum acceptance of one's fate as a flawed consumer^[10].

We must however not forget that the unemployed are not alone in the flawed consumer boat, and that the underemployed, and even the lower reaches of the working classes are also tinged with the retardation of their ability to live normal lives. This diverse lower echelon encapsulates the new poor, and it is these people who will be found isolated from the social mainstream due to their inability to speak the language of goods.

A 2005 study by the National Consumer Council suggested that the inability to consume is deeply frustrating to poor children. The report presents evidence that amid poor children, those who cannot consume as readily are the most beguiled by consumption.

"The children that have the least [...] are most interested in consumer and materialist concerns. This 'aspiration gap' is most marked in the poorest households. Their parents try hard to respond – poorer children tend to get more pocket money and will get crisps and snacks

in their lunch boxes – but these are the children most likely to be disappointed when birthdays come round." ^[4]

The new poor are however not the only aspect of society who are warped and altered by the monolith of consumption. The attitudes of those bestowed with sufficient consumer muscle to participate in normal life are also affected. The views of the middle and upper classes are frequently distorted by a consumer centric worldview, to see the poor as a blight upon the landscape, rather than human beings. In Bauman's words:

"And so for the first time in recorded history the poor are now purely and simply a worry and a nuisance. They have no merits which could relieve, let alone counterbalance, their vices. They have nothing to offer in exchange for the taxpayer's outlays. They are a bad investment, unlikely to ever be repaid, let alone bring profit: a black hole sucking in whatever comes near and spitting back nothing, except, perhaps, trouble. Decent and normal members of society – the consumers – want nothing from them and expect nothing. The poor are totally useless. No one – no one who truly counts, speaks up and is heard – needs them. For them, zero tolerance. Society would be much better off if the poor just burnt their tents and left. The world would be that much more pleasant without them. The poor are not needed, and so they are unwanted. And because they are unwanted, they can be, without much regret or compunction, forsaken." ^[8]

An increasingly commonplace rhetoric within Western society is to blame social ills upon "the entitlement mindset" or "the welfare state". A perfect example of the fuel for this fire erupted upon the UK's television screens in August of 2011, when flawed consumers up and down the country took to the streets to display their irritability, stupidity and lack of respect for society. The riots witnessed the flawed consumers break down store windows across the UK and consume without limits. They went out and forcibly took the products which they had been told they needed, but could not have.

Now, I for one condemn these actions and anyone who took part in them, but it is abundantly clear that such a seething, yet openly materialistic uprising mimics almost exactly the personality characteristics which Hutchens found ingrained in those unemployed in consumer societies^[9]. But alas, the ire of those imbued with normality and consumer purchasing power did not come to rest on the very values that they endorse. Instead the general condemnation stopped short of any meaningful change and came to bear exclusively upon the flawed consumers

themselves; blamed for being warped, stupid, irritable and anti-social in a society that denies the poor the means to live life otherwise.

This trend of stupidity, neurotic behaviour and anti-social tendencies is reflected in the inequality of mental illness across society. A typical counterpoint to this correlation is the argument that the mental disorders are the causal factor, i.e. those with mental illnesses sink to the bottom of society due to their inability to compete in the labour market. However, this view is in contrast to the observed mental disorder inequality amongst young children across consumer societies^[11].

Children are ultimately dependent upon their parents and guardians for financial support, and are not reliant upon their own merits, intelligence or civility. However the children within the poorest families of consumer societies display far greater rates of mental and behavioural problems, suggesting that the causal attribute to some degree is the inability to consume to a 'normal' level.

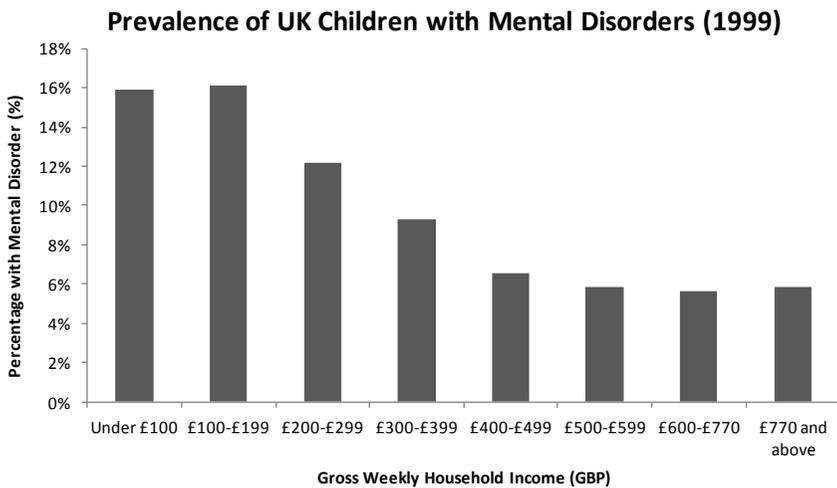


Figure 13-2: Plot of percentage of UK Children with mental, emotional or behavioural disorders, arranged by average weekly family income. Adapted by author from [11]

The degree of criticism toward poor youths who engage in violence, thievery or anti-social behaviour may well be founded at a personal level, but it none the less reeks of a lack of understanding with regard to the root cause of these behaviour patterns. Those who attempted to rationalise the UK riots through the lens of consumer inequalities were often shouted down by the mainstream consensus, citing that the rioters were stupid, ignorant thugs looking to cause chaos for no real reason^[12].

While in many cases this statement is truthful, it glosses over the important question of why these people have become ignorant, thuggish and hateful of society. It ignores the vast bodies of evidence that these people grew up in social situations with a far greater prevalence of mental and behavioural disorders, frustration, dissatisfaction, and far larger monetary barriers to socially acceptable forms of entertainment and education. It is painfully easy to dismiss such occurrences of violence as the mindless acts of thugs, but it is far more honest and effective in combating such issues to ask why the thug might be so mindless in the first place.

A Prerogative of Addiction

Those at the bottom of society are not alone in the negative effects of the consumer mindset. While they may gaze longingly at the trappings of a normal, middle class lifestyle, the reality is that the grass is always greener on the other side.

Shopping in a consumer society is marketed as a pleasurable pastime which can improve mood or act as a reward for hard work. The truth is however somewhat different to the perception. In the UK alone, a Morgan Stanley study showed that 28% of people have become aggressive or lost their temper during shopping trips^[13]. The worst offenders are not the poor, angered by their lack of funds, but rather the 'normal', middle class, middle aged female^[13]. During the UK's last Labour government, the amount of shoplifters in prison skyrocketed from 129 to over 1400, many of them women^[14].

This phenomenon, which has emerged from behind the veil of consumerism, has been labelled 'compulsive buying' by the psychiatric community, and arose approximately in line with the 1980s financial crisis^[15]. Compulsive buying is defined as being unable to consume within "normal" levels^[16] and has been estimated to affect as many as 10% of Americans^[17].

This idea of compulsive buying is however not a uniform issue. Even within the staunchest consumer societies, a great diversity of personal priorities exists, and a great variety of reasons for consumption. Sociologist Colin Campbell labelled the system of values built around this propensity to forever chase the next big purchase as "neophilia"^[18].

Campbell identified three broad categories which avid consumers typically fall into. The first demands that the products they own are pristine and as-new. The moment a product becomes too tarnished or imperfect for them to tolerate, it must be replaced. However, these 'pristiners' are generally insensitive to fashions

or trends, and typically stick to their own style. It is not unusual for this variety of consumer to simply replace the product with an identical new replacement^[18].

The second category is known as the 'trailblazer', and these neophiles generally gravitate towards technological products based upon their features, rather than the aesthetic values attached to them. A typical trailblazer dislikes being outdone, and will feel compelled to buy the latest technology even if the gain in utility is marginal. The trailblazer instead simply revels in the ability to show off or amaze others with the latest piece of hardware or interesting app^[18].

The final category is the 'fashion chaser', who is driven by the current social climate to make purchases. Consensus is generally enshrined; the typical fashion chaser seeks to fit in above all, and plays it safe by mimicking the current gospel of the big name high street stores. Like the trailblazer, the fashion chaser is typically young, although not always, and does not necessarily have any interest in the fashion industry. The chaser instead sees little more of fashion outside the current mainstream attitude, not only in clothing, but also cars, technology and music^[18].

So what causes this behaviour? Researchers at the Yamagata University School of Medicine have suggested that neophilia is linked to a mitochondrial enzyme known as monoamine oxidase-A, which may also have links to depression, reward dependency, substance abuse, attention deficit disorder, and social phobias^[19]. These are generally not positive characteristics, yet under a consumption based paradigm, this kind of addiction to "newness" is universally encouraged by government and business alike.

Campbell suggests a different line of reasoning, observing that older societies typically enshrined neophobia and resistance to change. As neophilia is a relatively recent addition to human behavioural tendencies, Campbell argues that the consumer society is to blame for this prerogative^[18]. Realistically, the truth lies somewhere in the middle, as with most false dichotomies of nature versus nurture. It is safe to assume that some part of this behaviour is innate to those biologically inclined in such a manner, but is exacerbated by a society which demands such actions. Arguments from nature should not be invoked to safeguard demonstrably damaging rituals.

Dissatisfaction

Amid children, dissatisfaction with consumerism has been assessed in numerous studies. A European Union report showed that over half of 14 to 18 year old girls in Scotland, Italy and Spain demonstrated an unhealthy and addictive

relationship with shopping^[20]. Results also consistently show that children who exhibit more materialistic desires and willingness to consume are more dissatisfied with their purchases than those who place less emphasis on materialism, as shown in Table 1.3-1.

Consumer attitude and dissatisfaction amongst children		
Statement	Dissatisfied respondents	Satisfied respondents
<i>“I care a lot about my games and other belongings”</i>	76% agree	65% agree
<i>“I like clothes with popular labels”</i>	82% agree	64% agree
<i>“When I buy something, the brand name is important to me”</i>	63% agree	49% agree
<i>“I like collecting things that others are collecting”</i>	69% agree	43% agree
<i>“There have been times when I feel I have been ripped off when I have bought something myself”</i>	77% agree	64% agree

Table 1.3-1: Summary of children's general level of materialism, correlated with their sense of satisfaction with their personal belonging. Note that children who place more importance upon material belongings are simultaneously more likely to be dissatisfied with them. Adapted by author from [21]

We must be careful to not conflate correlation with causality here, as it is possible that dissatisfaction is the innate driver of consumption for these people. Juliet Schor however suggests that the prevalence of consumerism is the cause of dissatisfaction rather than vice versa.

“High consumer involvement is a significant cause of depression, anxiety, low self-esteem and psychosomatic complaints. Psychologically healthy children will be made worse off if they become more enmeshed in the culture of getting and spending. Children with emotional problems will be helped if they disengage from the worlds that corporations are constructing for them. The effects operate in both directions and are symmetric i.e. less involvement in consumer cultures leads to healthier kids and more involvement leads to kids' psychological well-being to deteriorate.” ^[22]

This line of reasoning, and the results associated with it, further strengthen the argument presented previously. Consumption seems to breed a feeling of dissatisfaction and ennui, regardless of how personally endowed the individual is.

A further commentary on the addiction to consumption is indirectly reflected in the hours worked as a function of time. The working week has declined drastically since the industrial revolution, but since around 1940, the hours of work rose abruptly and have hovered around 40 hours ever since.

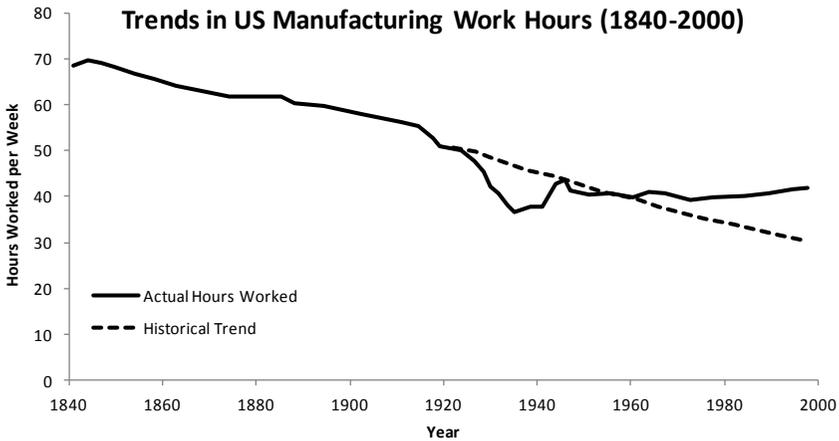


Figure 1.3-3: Trend of hours worked per week over time in U.S. manufacturing sector. Note how the pattern of declining hours began to reverse around 1940, and is now in a mild incline. Data taken from [23]

The stagnation of working hours in the face of massive increases in personal wealth and industrial efficiency seems unusual enough, but factoring in the effect of women entering the workplace paints a different picture. The influx of women through the 1960s and 1970s resulted in an increasing proportion of part time workers, which aggregates to an average reduction in working hours.

Correcting for this increase in part time work reveals that hours of work have in fact risen appreciably since the 1970s, with full-time jobs now on average requiring working weeks 10% longer than in 1969. The reason for this trend is multifaceted, and may equally be attributed to the shortcomings of growth, and the top down necessity for cyclical consumption*. However, some blame for this sorry state of affairs must rest on the shoulders of the hopelessly addicted consumer, working longer and harder hours to chase ever receding material gain.

The effect of this work-consume cycle may also be linked to the trends in retirement age across Western nations. Again, the issue is nuanced, and the

* A survey actually suggested that nearly half of working Americans would like to work a day less a week, regardless of the cut in pay^[24].

proliferation of debt is certainly a prime suspect in nudging the retirement age higher, but the prerogative of the consumer is to live in the here and now, chasing impulse rather than future security. This clashes fundamentally with the ideal of retirement in later life, and is reflected in the proportion of the workforce remaining in employment at increasing rates, despite the long term trends to the opposite.

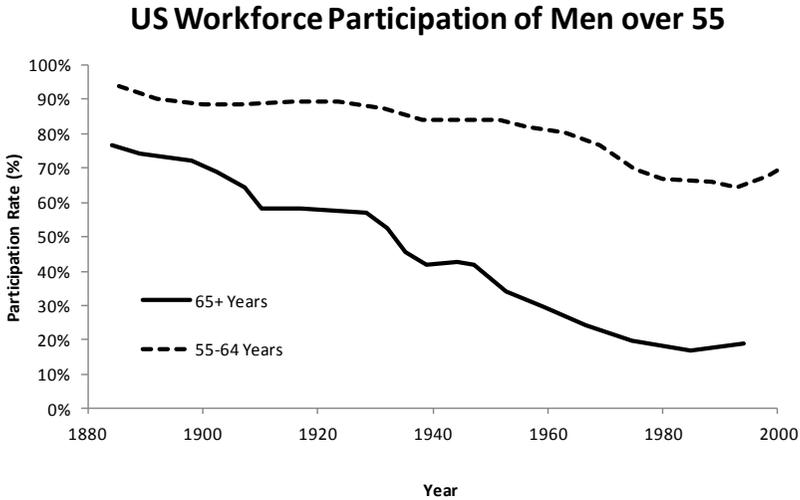


Figure 1.3-4: The trend of males aged 55+ in the U.S. workforce. Note that significant numbers of men aged 55+ remained in the workforce in the late 1800s, with this proportion falling over time. This is a reflection of progressively earlier average retirement ages. Note that across the 1980s and 1990s, the downward trend reversed, and began to slowly climb through the early 2000s. Adapted by author from [25] & [26]

A more poignant effect of this work-consume cycle is that ultimately, we live to regret it. Australian nurse, Bronnie Ware worked for over a decade in palliative care, during which period she logged the most common regrets which her patients expressed during their final moments. Surprisingly, the second most common regret of those who passed away under her care was *“I wish I had not worked as much.”* [27]

The sobering reality of this statement is that many consumers seem to intuitively understand that the work-consume cycle is intrinsically unfulfilling. Yet despite this, many remain hopelessly tethered to the process, due to the cultural normalcy of the consumer lifestyle. Downshifting and downsizing are demonstrable in their ability to reduce the stress of consumption, but they come with real costs in purchasing power, and by proxy, social status; some things that are too precious for many to give up.

Graham Hill, CEO of architectural and design firm Life Edited has commented upon how the explosion of belongings available to us has outstripped our ability to store it. In the USA there is currently a \$22 billion industry devoted to the storage of personal goods which either cannot be stored at home, or are no longer wanted at home^[28].

The absurdity of this scenario beggars belief. Large proportions of people now buy possessions for which they have no room or immediate requirement for, in order to pay to store these items in a unit on the other side of the city. For the video gamers amongst you, it is an interesting fact that 11% of video game owners still have games which have never been removed from the shrink-wrap^[29]. Similar gaps between the usage of purchases and the purchase itself are commonly echoed in other product markets.

Perhaps the most frustrating truth in all of this analysis is the fact that we know these things are true to some extent, and yet we are beguiled by consumerism regardless. The Joseph Rowntree foundation in 2008 published a report highlighting the 10 'evils' of modern Britain. This report featured consumerism as one of the ten overwhelmingly negative cultural trends in British society, alongside the decline of community, the rise in income inequality and poverty, among others^[30]. Other similar studies also place consumerism as an almost universally negative cultural phenomenon.

Despite this, we as a society seem hopelessly committed to consumption with a full understanding of the damage it does. Textbook definitions of addiction may point to similar behaviours in individuals - the alcoholic or chain-smoker knows full well the damage that their habit does to them, but they persist none the less.

Advertising and the Science of Sales

A statement with a corresponding footnote made previously in this chapter suggested that the modern consumer attitude and the language of goods are not natural biological or cultural developments. As already mentioned, defining human nature is an unwieldy task, so it is unwise to be definitive when speaking of such things.

Regardless, the historical perspective presented in the previous chapter surrounding the rise of obsolescence stands as strong testimony for consumption as a manufactured behaviour. The role played by powerful institutions in promoting consumption attests this, rather than a naive notion that such practises naturally burst into existence unprompted. To strengthen this point, the previous

chapter covered a great deal of material relating to the rejection of obsolescence and repetitive consumption by the general populace.

Modern science has however brought promotion of consumption to a whole new level of invasiveness and iniquity. While the institutions of old encouraged ever higher rates of consumption through suggestive, directed advertising, the leaps and bounds made in our understanding of human behaviour has allowed the general public to be duped into consuming more without even realising it.

Shopping and consumerist commentator, Rachael Bowlby, has written at great length about the design of modern shopping around popular psychology. In *Carried Away: The Invention of Modern Shopping* she reveals the extent to which shopping centres and malls are purposefully designed to direct footfall through inefficient and convoluted routes. Shopping centres which are designed to disorient in this manner prolong the journey of the shopper, often parading them past other outlets and statistically increasing the likelihood of impulsive purchases. The best (or worst) designed of these shopping centres can boast having up to 60% of their purchases made on an impulsive basis^[31].

Great progress has also been made in predictably modelling the way humans move through stores themselves^[32]. This has allowed outlets to put goods which are not particularly popular but which create a positive impact (such as fresh produce) nearer the entrance to the store, while goods which are already desirable by virtue will be buried more deeply inside, or off the beaten track^[33].

Shop fronts are also designed to entice through the unwritten rule that 'shiny is better'. It has been demonstrated that the shinier shops typically cause passersby to slow down more, in comparison to plainly decorated outlets^[32]. In addition, the interiors of shopping centres are almost always polished to a sickening sheen. None of this is unintended, as it has been argued in David LaBonte's wonderfully titled book, *Shiny Objects Marketing* that this attraction to glistening shops and products arises from an instinctual evolutionary characteristic to attract us to fresh water in the wild^[34].

The plot however plunges into darkness the more we assess the institutional usage of psychoanalytic advertising. In the 1920s, Edward Bernays, nephew of famous psychologist Sigmund Freud, became a highly esteemed and successful PR adviser to many large American corporations. Through his experience of PR campaigns across the USA, he argued that encouraging the general public to purchase more had a placating effect on the population, rendering people more docile and less subversive^[35].

Bernays became a guru in his field, and his resume included such feats as encouraging women to take up smoking against a strong culture of taboo,* however he had visions beyond the simple action of encouraging further sales. In *Propaganda*, Bernays argued that the bending of public opinion through PR techniques was a natural force that was good for democracy. He further added that the future of democracy lay in the hands of public purchasing habits, rather than the ballot box^[36].

Many of Bernays' sales tricks are still with us today. Celebrity endorsement of products, sponsored PR stunts and product placement in television and film were all approaches which were pioneered and honed by Bernays. To a modern reader, these may seem innocuous at face value, but at their inception these were revolutionary advertising techniques, rooted in a deep understanding of psychology.

A further, seemingly innocuous trick that Bernays may well wish he had invented is the ubiquitous '99-pricing'. This will come as no surprise to anyone who has set foot in a shop, but round numbers are generally uncommon in retail. A £600 television will typically be marketed at £599, a £2 item at £1.99 etc. This approach is not due to the manufacturers being pinpoint accurate in their pricing, but it is instead because reducing £600 to £599 seems like a significant reduction in price to our puny brains, when in fact it isn't.

Rigorous scientific study has consistently shown that products which use 99-pricing will typically appear far more attractive to consumers, and thus sell more than enough additional units to offset the small reduction in price. This is due to the leftmost digit dropping an order of magnitude, giving the consumer the illusion that the price is significantly lower than it actually is^[37].

While these simple tricks of the trade may seem benign to the average reader, the culmination of such techniques is significant. Advertising and marketing professions exist solely to entice individuals into buying things that they would otherwise not.

This is particularly interesting when looking across cultures, as a Drexel University study found. In former Soviet states, it was typical for the communist government to set prices to whole numbers. The study found that Polish citizens who had lived under the pricing system of communism were highly likely to see

* *Women smoking in the 1920s and 1930s was considered socially taboo, as the cigarette was viewed as a masculine expression of power.*

the 99 trick as "unfair" or "deceptive". Western buyers who were accustomed to such prices however did not react in this manner^[38].

So, given that so much effort and scientific rigour has been sunk into the art of making people purchase greater quantities of items, can we really blame this phenomenon on our own innate desire to greedily consume? Market apologists will frequently argue that this state of affairs is exactly what the customer base is asking for. After all, these people are parting with their hard earned money to purchase these things, the market is simply providing them with what they ask for. I would hope that the level of deliberate deception and underhandedness that has been demonstrated here is sufficient to bury this argument once and for all.

Choice

An additional, if somewhat counter intuitive ramification of the consumer society emerges from the axiom of perceived obsolescence. The fetishisation of goods as a means of driving consumption has led to a marked reduction in objective product parameters for consumers to compare. Increasingly aesthetic marketing of goods to niche sectors of society has led to a great number of technically very similar products within each range. Thus, within a given segment of niche consumers, the perceived product differences have become slight to non-existent^[39].

This reduction in objective comparison parameters between products has been accompanied by a marked increase in subjective differences. These changes are the stalwarts of aesthetically driven perceived obsolescence, such as trendiness, fashion, appeals to the consumer's individual image or personality, etc^[39].

A result of this is that purchase decisions can no longer be made if "*contemplated from a removed, dispassionate perspective*"^[40]. The consumer must instead make decisions based upon emotional cues, such as aesthetics, brand identification and a wide range of other subjective factors. Producers and salespersons thusly developed fields of research to properly capitalise upon emotionally entangled consumption. This field has become known as 'congruity marketing'.

This approach aims to align, or seek congruence between the projected image of a brand or product and the perceived image of a niche of consumers. As such, differences between products marketed toward niches are almost entirely based upon very subtle congruencies between the consumer's personality characteristics and the characteristics of the product^[41]. The same is true of more technical or hobbyist products which rely on some degree of taste or personal

preference. The choice of a model of musical instrument or bicycle may be significantly exacerbated over personal preferences of tone, comfort or niche utility.

This increase in a product's reliance upon more subtle aesthetic, personal and emotive characteristics has led to a crunch in the decision making time of consumers. A consumer does not have the luxury of spending an inordinate amount of time on research before committing to a purchase^[42].

This explosion in choice has led to a phenomenon which has been dubbed "time binding"^[43]. Time binding may manifest itself in anything from delaying a sale in the hope that new products or offers will emerge, seeking the advice of a friend or family, or simply looking to find out if the deal on the table can be bettered elsewhere^[44].

The concept of time binding, and the increasing complexity when choosing products in a consumer society has warranted large bodies of additional research relating to the psychological effects of increased choice. American psychologist Barry Schwarz carried out a study in which a sample of individuals was selected based upon their tendency to maximise or satisfice in everyday scenarios and consumer choices. The study followed the purchasing habits of these two broad groups while asking questions regarding purchasing decision time, level of satisfaction with the purchase, and regrets over not choosing something else.

It was found that those inclined towards maximisation were typically more likely to hesitate before purchases, and more likely to feel regret afterwards. Schwartz argues that this feeling of dissatisfaction is due to an escalation of expectation brought on by the massive choice available. Not only does the large spectrum of choice suggest to a consumer that there is a great product to be found somewhere in the haystack, it also suggests that if the purchase does not meet expectations, then it is the fault of the consumer^[45].

This dissatisfaction with oneself is far easier to rationalise in a situation where there are a near infinite number of choices. No matter how good the choice is, the consumer will always be haunted by the prospect that there was a better option.

This effect was quantified in a study of voluntary retirement funds. It was found that for every additional 10 fund options added to the portfolio of choices available, the probability of participation is reduced by 2%^[46]. The effect was further analysed in another study in which consumers were invited to a tasting

booth in a grocery store for a selection of jams. It was found that for the limited selection of 6 jams, 30% of consumers decided to buy a jar, while for the large choice selection of 24 jams, just 3% decided to buy^[47].

Now it must be said that this choice overload hypothesis is one which has been contentious, and is not common scientific consensus by any means. A meta-analysis of numerous consumer studies into the paradox of choice concluded that;

"In summary, we could identify a number of potentially important preconditions for choice overload to occur, but on the basis of the data on hand, we could not reliably identify sufficient conditions that explain when and why an increase in assortment size will decrease satisfaction, preference strength, or the motivation to choose. This might account for why some researchers have repeatedly failed to replicate the results of earlier studies that reported such effects."^[48]

The analysis concluded that while choice overload could still possibly be real, it is not fully understood what exact factors trigger it. Observations of the phenomenon have been repeated but without consistency. Given these repeated occurrences, it seems likely that something similar to an overload of choice does exist, and the reasoning put forth by Schwartz et al are convincing. However, we must be careful with acting upon an understanding which is incomplete.

If the paradox of choice does exist, even under select circumstances as is suspected, it does not bode well for the idea of consumerism, or for the health of the society as a whole. This is not to say that authoritarianism and anti-choice should be the way forward, but rather that toning down the level of inconsequential economic choices which we must make every day would reduce the feelings of regret and depression which may result.

Why Consumerism Exists

While listing the effects of consumerism is merited, the exercise is one in pointlessness without a view of consumerism in the larger social landscape. While many efforts have been made by brilliant men and women to draft policies and action plans to protect against the tides of consumption, several critical nuances remain absent from the vast majority of these solutions.

A generalised game-plan for the combat of consumerism is typically centred on the state, and this approach seems at least superficially sensible. State legislature and policy has, after-all, carved some impressive chinks in the armour of

consumerism, mostly in the realm of limiting advertising. But the fundamental flaw in this line of reasoning is that the nation state is subject to the same global market forces which channel consumerism into being.

The GDP growth of a nation is the de facto benchmark for success or failure in government. While limiting the pervasions of advertising in certain markets, and introducing regulation or taxation to others will truncate consumption to some degree, the government remains dependent upon increasing turnover year-on-year in order to facilitate GDP growth. This growth is theorised to secure jobs and job creation, reduce unemployment and drain on the welfare budget, increased national morale and facilitate improvement of living standards to at least some degree. Indirectly, this positivity is also likely to lead to re-election of the governing party concerned, if growth is consistent and sustained.

If we draw the reasonable parallel that growth is generally seen as a prerogative for government, and that repetitive consumption is an excellent source for growth, then it is intuitive to suggest that a government which introduces firm legislation against consumerism, advertising and repetitive consumption is self-defeating to some degree. I must press the point that I am generalising, and reduction in consumption need not always lead to drastic effects on growth in all markets; but when an economy is reliant upon growth, consumerism and repetitive consumption cannot rationally be seen as anything other than a net benefit.

Herein lies the quandary of the state. On the supply side, the state must safeguard the large influential businesses which promote growth, regardless of their questionable methods for selling products. On the demand side, the state must protect its population from the large businesses upon which all are dependent. In Marxian terms, the state is reliant upon the capitalists for investment, and upon the proletariat for votes.

The position is one which cannot be fully resolved without massive reforms in the way markets operate, the way value is determined and the manner in which governments interact with finance. While taxes levied against producers on goods which enshrine repetitive consumption seem a good compromise to please both parties, the producer always reserves the right to move production to a country where such taxes do not exist. As such, the modern stance of the state on this topic in reality is banally predictable.

This is the reason why efforts to battle consumerism seem so marginal and of such token value; because they are simply against the interest of the state if

taken too seriously. This too is the reason why modern culture remains beguiled by disposability, vapidness, invasive advertising and the celebration of shopping as the heart and soul of our cities. It is why mainstream discussion of social models designed to pragmatically deal with consumerism and obsolescence fizzled out in the mid 1940s.

Unravelling the problem of consumerism is an action which cannot flourish in isolation. Its complex relationship with economic growth, and thus by proxy with the fundamental mechanism of debt backed money creation, is an intricacy that is often overlooked by proponents of ethical consumption, or downshifting. This is not to say that these ideas are necessarily bad in any way, but the fundamental truth of economic growth destines isolated application of these approaches, without wider social reform, to be at best ineffective on a small scale, and at worst economically suicidal if ever exercised en masse.

The engine of economics requires consumption, and as we will discover, the very concept of our monetary supply demands a year-on-year growth of this consumption in order to stave off recession and its associated malignity. The problem of consumerism is one which is ingrained within the market paradigm, and without significant modification to this economic system, consumerism, and the portfolio of social ills within its arsenal are sadly here to stay.

Conclusion

In this chapter, we have broached several taboos of the market. I would hope that the analysis and discussion herein has convinced the reader of at least the following points:

- The social implications of consumerism are almost overwhelmingly negative.
- The prerogative for humans to consume goods at a high and sustained rate is not a 'natural' occurrence, and is the product of decades of psychological conditioning.

The origins of consumerism lie almost solely within the scope of the engine of economics, and its requirement for continual repetitive consumption. Given that society has been subjected to such targeted and scientific campaigns to stimulate more consumption, and had historically resisted such shifts in culture, it is simply invalid to blame the rise of consumption on the whim of the average citizen.

Note that consumerism has further ramifications to the environment, as purchasing more items inevitably results in more resources being stripped from the earth to manufacture said items. For concision, discussion of this is contained within chapter 1.11, but it is worth bearing in mind here in order to understand the full scope of the consumerist paradigm.

The conclusion of this chapter is therefore very clear cut, I hope. Consumerism is a construct that has been purposefully built by institutions in order to safeguard their own turnovers. This is not a moral judgement against the integrity of these institutions per se, as they are simply acting based upon the incentive structure around them. It is instead the system of market economics which fundamentally enshrines cyclical, repetitive consumption, and it is this system which is at fault.

A system which requires constant circulation of value in order to remain functional will inevitably require a culture which supports this. It is therefore not at all surprising that so many of Bernays' dirty PR tricks from the 1920s are now so banal, that even the most morally obligated businesses must use them to get their products or services sold. The consumerist society is simply an outgrowth of the market system and, especially under a paradigm of mandatory accelerating economic growth, the two are inseparable. As such, I would argue that the effects of consumerism are a strong indicator that a shift away from the market economy is needed.

Chapter 1.3 - References and Notes

- [1]. Colin Flinn, *Intu Trafford Centre Brochure*, 2014 - <http://www.intugroup.co.uk/media/80311/intu-trafford-centre-brochure-21102014.pdf>
- [2]. Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet*, Routledge, 2011.
- [3]. Richard Elliott, Claire Leonard, *Peer pressure and poverty: Exploring fashion brands and consumption symbolism among children of the 'British poor'*, *Journal of Consumer Behaviour*, Vol. 3, 2004.
- [4]. Ed Mayo, *Shopping Generation*. National Consumer Council, 2005.
- [5]. Neal Lawson, *All Consuming*, London: Penguin, 2009
- [6]. Alain de Botton, *Status Anxiety*, Penguin, 2005
- [7]. Juliet B. Schor, *The Overspent American: Upscaling, Downshifting and the New Consumer*, Harper Perennial, 1999
- [8]. Zygmunt Bauman, *Work, Consumerism And The New Poor*, McGraw-Hill Education (UK), 2004, pg 115
- [9]. Stephen Hutchens, *Living a Predicament: Young People Surviving Unemployment*, Avebury, August 1995
- [10]. Peter Kelvin; Joanna E. Jarrett, *Unemployment: Its Social Psychological Effects (European Monographs in Social Psychology)*, Cambridge University Press, 10 Oct. 1985
- [11]. HM Government Department of Health, *Choosing Health: Making Healthy Choices Easier*, 2004, pg 66
- [12]. Max Hastings, *Years of liberal dogma have spawned a generation of amoral, uneducated, welfare dependent, brutalised youngsters*, *Daily Mail* - <http://www.dailymail.co.uk/debate/article-2024284/UK-riots-2011-Liberal-dogma-spawned-generation-brutalised-youths.html>
- [13]. Cayte Williams, *Rise of the Botox Battleaxe*. *New Statesman*. 16 May 2005 - <http://www.newstatesman.com/node/150633>.
- [14]. Simon Jenkins, *Britain's prisons reek of a wretchedly backward nation*. *The Guardian*. 20 June 2007 - <http://www.guardian.co.uk/commentisfree/2007/jun/20/comment.politics>.
- [15]. Shirley Lee, Avis Mysyk, *The Medicalization Of Compulsive Buying*, *Soc Sci Med*. 58(9) pp1709-18, May 2004.

- [16]. R. Faber, T. O'Guinn, R. Krych, *Compulsive consumption*, Advances in Consumer Research, 14, pp132–135, 1987.
- [17]. H. Dittmar, *The role of self-image in excessive buying*. In A. Benson (ed), *I shop, therefore I am: "Compulsive" buying and the search for self*, pp. 105-132. New York: Aronson. 2000.
- [18]. Colin Campbell, *The Desire For The New: Its Nature And Social Location As Presented In Theories Of Fashion And Modern Consumerism*, Edited by R. Silverstone and E. Hirsch, *Consuming Technologies: Media and Information in Domestic Spaces*, London: Routledge 1992, pp48-46
- [19]. H. Shiraishi et al, *Monoamine oxidase: A gene promoter polymorphism affects novelty seeking and reward dependence in healthy study participants*. Yamagata City, Psychiatr Genet., 2006.
- [20]. Neal Lawson, *All Consuming*, London: Penguin, 2009, pg 157
- [21]. National Consumer Council, *Generation X*, July 2005
- [22]. Juliet B. Schor, *Born to Buy: the commercialised child and the new consumer culture*, Scribner, 2004
- [23]. U.S. Bureau of Labor Statistics, Historical Release Tables - <http://www.bls.gov/data/#historical-tables>
- [24]. Center for the New American Dream, *Analysis Report: New American Dream Survey 2014*, pg 3
- [25]. Alicia H. Munnell, *What Is The Average Retirement Age?* Society of Actuaries Newsletter, February 2012, Issue 76
- [26]. Dora L. Costa, *The Evolution of Retirement: An American Economic History 1880-1990*, University of Chicago Press
- [27]. Susie Steiner, *Top five regrets of the dying*, The Guardian, 1 February 2012 - <http://www.theguardian.com/lifeandstyle/2012/feb/01/top-five-regrets-of-the-dying>
- [28]. Tanya Benedicto Klich, *The War On Clutter*, Entrepreneur, February 10, 2014 - <http://www.entrepreneur.com/article/231359>
- [29]. *DVD and Video Game Packaging Not Going Out With the Trash - Inside EMA*, The Entertainment Merchants Association (EMA), Vol 6, Iss 4, January 2009, pg3
- [30]. Beth Watts, Charlie Lloyd, Alice Mowlam, Chris Creegan, *What are today's social evils?* Joseph Rowntree Foundation, 1 April 2008
- [31]. Rachael Bowlby, *Carried Away: The Invention of Modern Shopping*, New York, Columbia University Press, 2002
- [32]. Paco Underhill, *Why We Buy: The Science of Shopping*, Texere Publishing, 2000.

- [33]. Herb Sorensen, *Inside the Mind of the Shopper: The Science of Retailing*, Financial Times / Prentice Hall, 2009.
- [34]. David A. LaBonte, *Shiny Objects Marketing: Using Simple Human Instincts to Make Your Brand Irresistible*, John Wiley & Sons, 2008.
- [35]. Adam Curtis, *Century of the Self*, BBC Mini Documentary Series, 2002
- [36]. Edward L. Bernays, *Propaganda*, LG Publishing, 1928
- [37]. Robert M. Schindler; Thomas M. Kibarian, *Increased Consumer Sales Response Through Use of 99-Ending Prices*, Journal of Retailing, Vol. 72, no. 2 1996
- [38]. Rajneesh Suri, Rolph E. Anderson, *The use of 9-ending prices: contrasting the USA with Poland*, European Journal of Marketing, Vol.38, No 1/2, 2004, pp56-72
- [39]. Piyush Kumar Sinha; Arindam Banerjee, *Store choice behaviour in an evolving market*, International Journal of Retail & Distribution Management Vol. 32 Iss: 10, pp.482 - 494, 2004
- [40]. Steven J. Hoch; George F. Loewenstein, *Time Inconsistent Preferences and Consumer Self Control*, Journal of Consumer Research, Vol 17, pg493, 1991
- [41]. T. R. Graeff, *Consumption Situations and the Effects of Brand Image on Consumers' Brand Evaluations*, Psychology & Marketing, Vol. 14(1), pp. 49-70, 1997
- [42]. Subhashini Kaul, *Consumerism and Mindless Consumption Sustaining the New Age Urban Indian's Identity*, Indian Institute of Management Kozhikode, 2007.
- [43]. Edward Ellsworth Jones, Harold Benjamin Gerard, *Foundations of social psychology*, John Wiley & Sons Inc; First Corrected Printing edition, July 1967.
- [44]. Omar Shehryar, Timothy D. Landry, Arnold J. Todd, *Defending Against Consumerism: An Emergent Typology Of Purchase Restraint Strategies*. University of Missouri - Columbia : Advances in Consumer Research, Vol. 28, 2001.
- [45]. Barry Schwartz, *The Paradox of Choice: Why More Is Less*, Harper Perennial, 2005
- [46]. Sheena Iyengar, Wei Jiang, Gur Huberman, *How More Choices Are Demotivating: Impact Of More Options On 401(K) Investment*, PRC WP 2003-10, Pension Research Council Working Paper, 2003 .

- [47]. Sheena Iyengar, Mark Lepper, *When Choice is Demotivating: Can One Desire Too Much of a Good Thing?* *Journal of Personality and Social Psychology*, Vol. 79, No. 6, 995-1006, 2000.
- [48]. Benjamin Scheibehenne, Rainer Greifeneder, Peter Todd, *Can There Ever Be Too Many Options? A Meta-Analytic Review of Choice Overload*. *Journal Of Consumer Research, Inc.* Vol. 37, October 2010.

1.4 An Unsound Foundation

DEBT IS A WORD WHICH IS ubiquitous within modern discourse. Owning money to an institution is mundane and commonplace in just about any Western nation, such that listing examples is redundant. Despite this, very little analysis or critical attention is dedicated to how debt is actually accumulated. Sweeping assumptions dominate public opinion regarding how the very mechanics of debt and money function.

The effects of debt can be seen even by the most economically uninitiated individual. Prosperous Western nations operate at gigantic governmental deficits and hold accumulated domestic debts often well into the trillions of U.S. dollars. UK students emerge from university, looking forward to a millstone of academic debt around their necks for the foreseeable future, only to be built upon at a later juncture by the rite of passage that is the mortgage. Debt has become almost unavoidable and accepted. Borrowing to buy is common custom; it is virtually unheard of even in the prosperous West for anyone but the rich to buy a house, or even a new car outright.

But a step back from the situation is in order. The absurdity of the predicament must be understood. How are the majority of the wealthiest countries simultaneously crippled by debt? Who is this money owed to? How did this scenario develop? The physical production power and development of Western countries is seemingly at odds with their economic and financial ruin, yet the situation persists, if not worsens with further economic growth and progress.

How can this be so? Common intuition dictates that economic growth brings prosperity, and along with prosperity comes more money to pay off the debts which we have incurred. Yet this is not what we are seeing in the real world.

The Elephant in the Room: Fractional Reserve Banking

The process of fractional reserve banking is a global one; let that be made clear at the outset. There are no national or commercial banks in existence where this method of banking is not in operation. This is crucial as a commentary on where the world's money has actually come from, as will be discussed later. The

illogical mathematics of this banking system are often difficult to digest, it is therefore important to paint a clear initial picture of the system before embellishing it with the intricacies. As such it is prudent to initially illustrate the way in which banks developed through a simplistic example.

The setting is Europe in the Middle Ages. The European economy at this point was based primarily on physical tokens of gold and silver, similar to the coins of today. A merchant going about business in the Middle Ages would naturally accumulate unwieldy amounts of gold and silver as a result of trade. This mass of physical money is obviously a hindrance to mobility, and safety from theft.

The shrewd village goldsmith recognises this hindrance, and thus extends an offer to the merchant for a place to keep his gold safe; be it a vault or lock-up of some form. The merchant would naturally oblige, as he would still retain access to the money, but could sleep easy knowing his coins are safe from theft^[1].

The goldsmith would similarly extend this offer to other merchants, traders or anyone with gold in need of safe keeping, knowing that it is in their best interest to do so. People who took up the offer would be provided with a simple IOU, signed or endorsed in some way by the goldsmith, which would allow access to the amount of gold deposited.

The first question to pose here is why would the goldsmith do this out of the goodness of his heart? It is his vault which he has no doubt paid for, so why would he want to offer this service to people free of charge?

The answer is that the goldsmith knows that the probability of all the merchants, traders and patrons coming to the bank simultaneously to withdraw all of their gold is slim to nil. Many will come often to withdraw some of their gold, but the sum total of the amount in the vault will always be more than adequate to cover this demand. Because of this fact, the goldsmith has a semi-permanent stockpile of gold which isn't really doing anything. As such, the goldsmith may dedicate this gold to his source of income; usury^[1].

Usury is the provision of loans or credit to a customer to be paid back at an interest, generating a profit in absence of a service charge for using the vault. The goldsmith will approximate the average amount which is required for withdrawals on a daily basis and ensure that this amount is always present in the vault. This is the fractional reserve, as it represents a fraction of the amount deposited which is kept in reserve. The money in excess of this fractional reserve amount can then be loaned out at interest to customers in need of gold^[1].

The result of this is that the vault never has enough gold in it to cover a situation where large amounts of people withdraw. This scenario is known as a run on the banks and still occurs today, the 2007 collapse of UK bank Northern Rock being a prominent example^[2].

However this fractional reserve alone does not account for the entire issue. The usage of IOUs in this system is one that has been overlooked, despite deceptively far reaching repercussions. When issuing IOUs to patrons, the result is a piece of paper which is backed by a valid contract to deliver a specific amount of gold. As such, the paper holds exactly the same value as the gold in the vault.

Picture a typical transaction: a holder of an IOU wishes to purchase an item or service. In order to do this he must exchange gold with the trader. However, this would involve going to the bank in order to withdraw the gold and then returning to the trader. Similarly, the second trader would have to take ownership of the gold, and then return it to the bank to pay it into his account - a convoluted process. Rather than risk theft while travelling to-and-from the bank laden with cumbersome gold coins, the natural alternative is to simply exchange the IOU.

This allows the trader to hold access to the gold in the vault which previously belonged to the customer. The logistics of this exchange are favourable for both parties; the gold remains safe, unwieldy amounts of gold are not thrust upon either person, and the net outcome is the same as a physical exchange. This represents the birth of paper money; paper backed by gold which is treated with the same properties as the gold it represents^[3].

While this may seem a harmless method to expedite exchange, it must be underlined as important. Because the vast majority of transactions are taking place without gold actually moving anywhere, the gold obviously remains untouched in the vault. Gold that is sitting around in the vault is gold which is crying out to be loaned to customers who need it. More loans lead to more interest payments which inevitably lead to higher profit, so the incentive to lend rather than hold on to static money is a very powerful one. As such, the goldsmith is able to reduce his fractional reserve further, due to the proliferation of paper money making physical withdrawals rarer.

This paper money has a further crucial implication. Because the customers who are in need of loans are likely to favour paper money's security and ease of transport, there is no reason why the goldsmith needs to have actual gold in the

vault in order to lend. The goldsmith is therefore able to conjure paper money into existence based on a promissory contract of indebtedness.

This is a powerful point, and one which is difficult to fully comprehend. The money which the debtor receives through his loan is paper, not backed by gold in the vault but instead backed by the debtor's promise of repayment. The goldsmith does not loan money that he already has, but instead loans money based upon the promise of the debtor's future repayment. The goldsmith can do this because he knows that paper money is generally the preferred medium of exchange, and therefore he does not need gold in the vault to safeguard the loan. As we will see, this is essentially the method of money creation which modern banks exercise today. The specifics and ramifications of this incredibly abstract process in a modern context will be covered presently.

Modern banking of course offers another variety of currency on top of coin and paper. Digital currency is money that exists solely as numbers in a computer. It is this money which is of critical importance to understanding the shortcomings of our current financial system. The predominance of digital currency and digital transfers in modern trading is precisely why the system superficially appears to work. Salary payments, loans, bank transfers, loan repayments, credit and debit card payments are all by and large a digital affair in a modern economy. Physical cash is little more than a day to day convenience, typically used for small to medium sized personal transactions. Anything which requires a transaction larger than this is almost always digitised.

When a customer goes into a bank and requests a loan, the bank does not provide actual gold-backed money from the vault reserve, as common sense may suggest. Just like the goldsmiths of antiquity, the new, digital money is loaned into existence upon the agreement to repay. Thus, the borrower's future debt is monetised and becomes available as digital money at that instant, which is as valid as fiat currency.

The actual process of this is as simple as adding the requested loan onto the borrower's balance. No subtraction is made to the bank reserve. No transfer between the bank and the borrower occurs. The money is simply conjured into existence by a private company, and holds the same validity as the government printed coins which it represents.

There is however a knock-on effect of this isolated creation process. The money is digital, and immediately credits the bank balance of the borrower; this money can then become part of the fractional reserve of the borrower's bank (for

simplicity we will assume that this is a different bank to the provider of the loan). The second bank is then able to set aside a proportion of the created money as a fractional reserve and then loan the rest out. However, the amount which the bank can loan out is in addition to the deposit, not subtracted from it. This is because the bank does not use its own deposits to fund loans; it creates loans based on future debt repayments at interest.

The complexity of this transaction is difficult to grasp due to its counter-intuitive nature. It is again therefore one which is best perused by an illustrative example. In this example, the fractional reserve considered is 10%. This means that the bank must keep 10% of its deposit in reserve, allowing 90% of the deposit value to be provided as loans.

Suppose a borrower requests a loan from Bank 0 for £1000. The bank obliges and credits the account of the borrower with £1000 of newly created money. The borrower's account holder is Bank A. Bank A receives £1000 as a deposit. This deposit is considered as valid as an equivalent deposit of fiat currency, regardless of its origins.

The £1000 received by Bank A is split into a reserve component - in this case 10%, or £100 - and 90% is set aside as £900 to raise new loans against. It is important to note that at this point there is £1900 in the money supply, as the original borrower *still* holds £1000 in their account.

Bank A is then able to loan out £900 based on the original £1000 deposit. However, the £900 loaned is not the same £900 as that which is deposited with the bank. The further loan of £900 is created based on debt, in addition to the £900 held as bank assets. It must be fully understood that this created money is not backed by anything. It is not backed by assets, nor by gold.

This effect propagates as a diminishing return relationship through further loans and deposits, as shown in Figure 1.4-1:

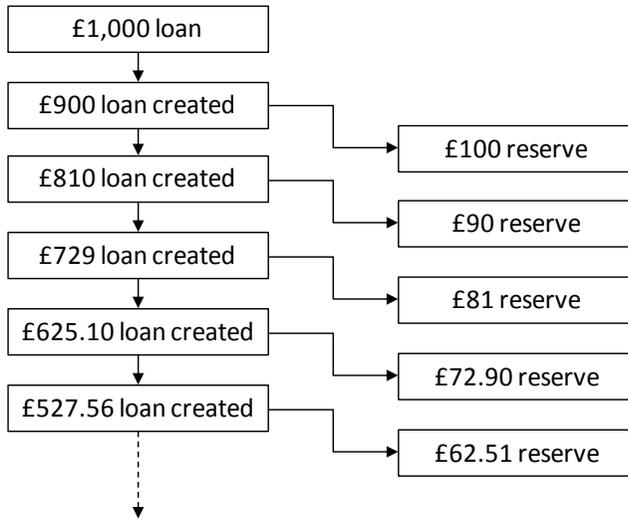


Figure 1.4-1: Flow chart of the fractional reserve money creation process. Adapted by author from [5] into graphical form

The basic mathematics of this progression is as follows:

$$m = 1/R_r$$

Where m is equal to the money multiplier, or the amount of money created as a factor of the original deposit, and R_r is the fractional reserve ratio[4]. For example, in this case, the value of R_r is 0.1 (this is the 10% reserve requirement previously mentioned), therefore:

$$m = 1/0.1$$

$$m = 10$$

This means that for a group of banks operating a 10% fractional reserve policy, any deposit can result in 10 times that amount being created as new money. Expressed graphically, as in Figure 1.4-2, the limit to which the money creation process tends toward can be seen more clearly. It also shows how different reserve ratios affect the money multiplication process^[4].

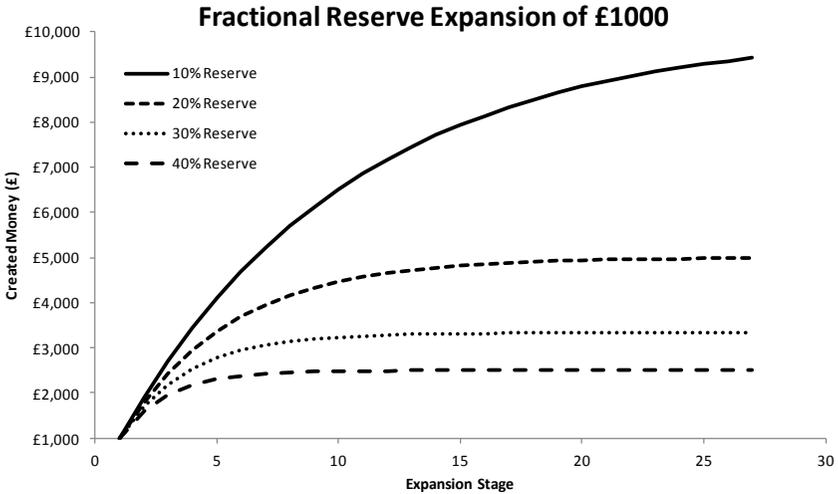


Figure 1.4-2 - Example expansion of £1000 at varying reserve fractions. Adapted by author from [4], pg 11

This model is however theoretical, and the amount that can be created is usually less than this. This is due to the fact that borrowers tend to keep some of their loans as cash-in-hand, rather than computerised within the banking system. This can be modelled by applying a currency drain ratio to the money multiplier, which roughly represents the average fraction of money which the borrower will keep out of their account in the form of physical withdrawals [4]. The money multiplier hence becomes:

$$m = \frac{1 + C_D}{C_D + R_r}$$

Where C_D is the currency drain ratio. For the above example of a £ 1000 original loan being multiplied via this mechanism, consider a borrower on average retains 5% of the loaned money on their person as physical money. This would result in a multiplier as follows:

$$m = \frac{1 + 0.05}{0.05 + 0.1}$$

$$m = 7$$

Thus, a more conservative 7 times the original deposit may be created in this more realistic case. Regardless of modelling method used, the ability to leverage new money into existence under this operating system is astonishing, and the

figures relating to the money supply growth in modern economies are staggering, as will be discussed.

The result of this is an increasing money supply, inflated by monetised debt. This is shown in Figure 1.4-3 & Figure 1.4-4. It is observed that the actual physical fiat currency (physical coins and paper) on both figures does not change dramatically. It also represents an increasingly small fraction of the overall money supply.

As we have demonstrated, all of this additional money on top of the basic currency is digital, and has been created in central and commercial banks through fractional reserve lending. As Figure 1.4-3 & Figure 1.4-4 so clearly demonstrate, the proportion of the digitised, debt backed money is far and away the majority, with physical money making up just 3% of the overall money supply in the USA.

Enforcing Liquidity and Reserve Ratios

So how exactly has the explosion in the money supply come about, and why do we notionally think that banks only lend money which they have available to them? The reason is that for much of modern history, to some degree, banks were legally bound to do just that.

Governments have typically placed restrictions upon the amount of money banks are allowed to create. Of these restrictions, the 'liquidity ratio' represented the fraction of money which a bank was legally required to maintain in its reserves, and was typically set at around 10%. This meant that from fiat currency printed by the government, the bank was permitted to create 90% of its value through loans, and had to maintain a minimum of 10% in liquid assets.

The liquidity ratio was however scrapped in 1981 in the UK, and ever since, British banks have operated a so called 'voluntary reserve requirement'^[14]. Even though this means that an essentially infinite amount of money can be created at the whim of banking institutions, and the money supply in the UK has swelled nearly exponentially, with falling cash asset ratios since the late 1960s, it is not viewed as an issue. Many other countries also operate with a similar, uncontrolled scheme of money creation, such as Sweden, Canada, New Zealand and Australia^[15].

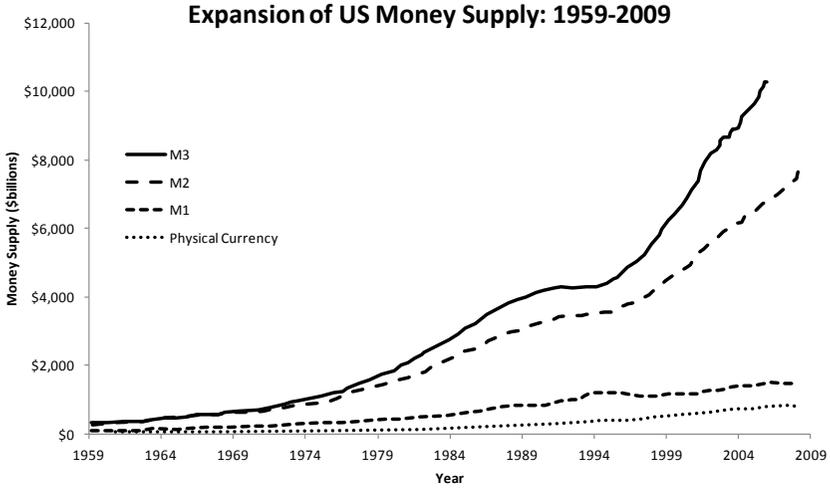


Figure 1.4-3 - Expansion of U.S. monetary components: 1959-2009 - Plotted by author using data from [7] - It should be noted that the Federal Reserve ceased releasing data relating to M3 after 2005, in a move viewed by many^[6] to be a deliberate sleight of hand in masking the scale of inflation in the U.S. dollar.

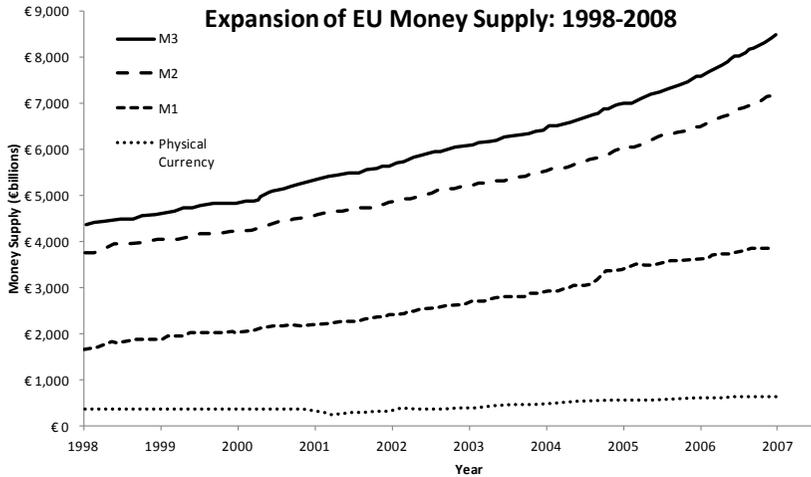


Figure 1.44 - Expansion of EU monetary components: 1998-2007 - Plotted by Author using data from [8]

The flagrant disregard and lack of scrutiny in respect to the way money is created seems laughable. Money is one of the most universal forms of communication on this planet, yet the explosion of the money supply at the behest of private institutions makes it appear as little more than a play thing. However, there is a further, much more severe ramification of this debt-backed money supply expansion; the expansion of the debt itself.

The Debt Expansion

As we have seen in Figure 1.4-3 & Figure 1.4-4, lending institutions have extended loans in order to inject large sums of money into the national money supply. For the USA, an additional 97% of digital money has been built upon an increasingly small backbone of physical currency. The upshot of this creation process should be relatively obvious; the entirety of this additional digital money is wholly owed as an equivalent debt to lending institutions.

Perusing real-world statistics shows consistency with this, as the volume of debt rises in tandem with the increase in money supply. Figure 1.4-5 & Figure 1.4-6 show the extent of this debt driven money expansion in the U.S. between 1959 and 2009, and in the UK between 1963 and 2005. There is however one critical property of these figures which must be scrutinised further. For both nations, the aggregate private debt is visibly greater than the entire domestic supply of money, and has been for some time. How is this possible?

If debt is accrued equal to the amount of money that is created, then it should be true that debt will be exactly equal to created money at all times (minus existing physical currency). This is not the case, as we can clearly see. The explanation to this discrepancy lies in the interest charged by lending institutions. The fractional reserve process creates an amount of money which is equal to the principal of the loan requested by the lender. However, the lending institution demands an amount to be repaid which is equal to the principal, plus an arbitrary interest. This means that the debt accrued through money creation is always marginally larger - by an amount determined by interest rate - than the money created.

The result of this is a debt which constantly outstrips the creation of money to pay it; an ever increasing gap between the money owed and the money available. However, this is not entirely what we are seeing here, as the debt-to-money gap is not growing consistently larger with increasing time.

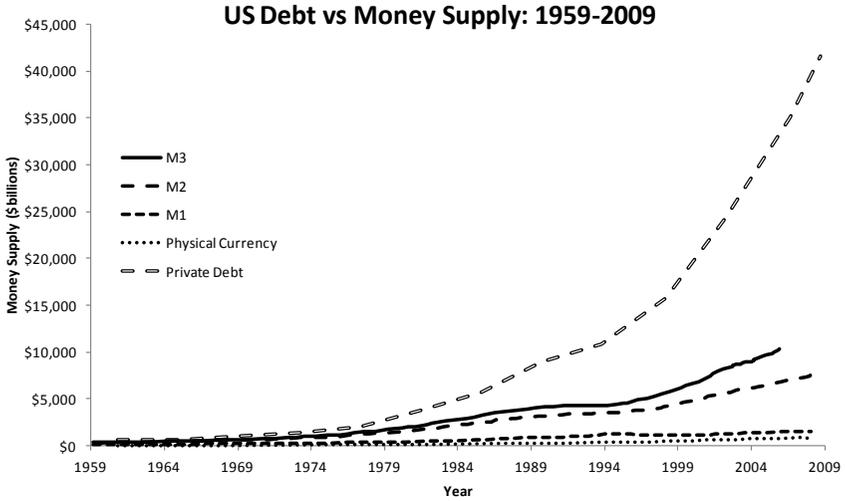


Figure 1.4-5 - U.S. monetary components in comparison to total private debt: 1959-2009 - Data for money supply components reproduced from Figure 1.4-3. Total private debt encompasses all sectors, credit market instruments and liabilities - Data plotted by author from [9]

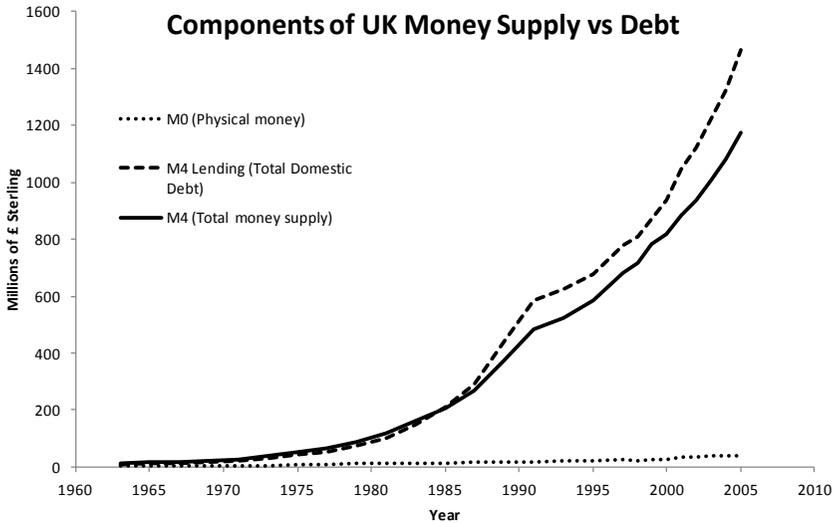


Figure 1.4-6 - UK monetary components in comparison to total domestic debt: 1963-2005 - Data plotted by author from [10] - Note that in a similar move to the U.S. Federal Reserve, the Bank of England also opted to stop reporting certain money components after 2005. Instead, they discontinued the increasingly tiny physical money measure (m0) in Q1 of 2006 ^[11]

For example, the UK data in Figure 1.4-6 shows a difference between money supply and debt which is considerably smaller in the years around 2000, than in the years around 1990. This is not explained by interest, as such a scenario would show a continually increasing discrepancy between money available and money owed as time went on. What is happening here?

International Trade

The explanation of such occasional reductions in the debt with relation to created money is due to the way modern money is used after its creation. We currently live in a world of international trade; an economy dominated by import and export between countries. However it is not often considered how the logistics of money crossing borders affects the debt which is registered against it.

Exchange for goods or services involve the remote transfer of digital funds between businesses based in different nations. The digital money exits the importer's domestic economy and enters the exporter's, where it may be spent, invested or withdrawn (exchanged for physical money) with just as much validity as any other unit of currency.

However, it is crucial to understand that the debt which is raised against this money is not transferred to the exporter's domestic economy alongside the created money. The debt remains registered domestically in the importer nation, while money is subtracted from their money supply and added to the supply of the exporter nation. The result of this process is obvious; a reduction of the debt-to-money ratio on the export side and an increase on the import side. As monetary reformist, Michael Rowbotham explains;

"Nations have independent financial status. Each nation is a discrete financial unit in terms of its own currency, its own banking system, its own money supply, its own domestic debt and its own national debt. [...] Their debt is nationally based, so the only way to earn money is to sell internationally; and moreover, to sell more than they buy. Thus all nations try to export more than they import. [...] The debt-based financial system literally destroys the 'balance' of commercial activity between nations. In effect, the nations of the world are all fighting for each other's currency and defending their own money supply in a world dominated by debt, attempting to use their export-trade as a method of alleviating their financial insolvency."^[12]

It is therefore not surprising that the aforementioned reduction of UK debt with relation to available money occurs coincidentally with the UK's "longest expansion on record"^[13] up to that point in time.

Nations using international trade as a primary vehicle for relieving their debt burdens profoundly affects market dynamics. Fundamentally, this process acts to mask the underlying problem of debt, allowing localised pockets to develop where debt is less than the money available to pay it, and thus swaying opinion that total recovery is possible.

This, in part, is responsible for the endless chase of growth and new markets to export to, as economies are fooled into thinking that they can outrun their debt through hard work. This however is localised, and any local reduction in debt will result in an increase in debt on the import side of the trade. It is obviously impossible for all nations on the planet to become net exporters; therefore the debt is merely being moved around rather than reduced.

A further ramification can be drawn from this analysis, as while it is impossible for all countries to become net exporters, the debt economy encourages them to try their hardest to achieve this impossibility. This helps to create an artificially tense global market, in which the tendency towards mass export is further exaggerated, in order to attempt to bring new debt free money into the domestic economy.

However, the lunacy of this situation is that no matter how much export grows, someone always must import; it is a zero sum game. This economic arms race in order to outrun domestic debt causes unimaginable waste and inefficiency, as goods are constantly shifted massive distances between economies, in a desperate attempt to attain a trade surplus.

Deep Rooted Ramifications

The vision of a marketplace where people vote with their dollar to support the products they like best, is the staple of modern capitalism. It rings with a clear tone of fairness and economic democracy, and as such has become a totem in public opinion. However such a vision is wholly dependent upon the currency which the people use to place their vote. In order to foster the economic democracy which free-market proponents laud, such a currency must be transparent and without bias. Is a currency which is based on debt really conducive of such economic democracy?

The artificially intense marketplace, exacerbated by debt, is one which is not considered by economic orthodoxy. Any fierce competition that is witnessed in the free market is assumed to be voluntary. Any financial hardship is considered to be self inflicted by poor economic choices by the individual, country or business. But is this really the case? The shadow debt breathes down the neck of more than the economically naive. It is a presence which drives the decisions of people indiscriminately, be they in the board rooms of multinational corporations or around the family dinner table.

In recent years we have seen the collapse and acquisition of such giants as EMI under debts held by Citigroup^[16]. We have seen the near complete collapse of entire sovereign countries such as Ireland and Greece. Conventional thought leads us to the conclusion that these institutions "did something wrong" or "made mistakes". It is not considered that they were backed into a corner by debt based economics and had very little choice in the matter. Yet by even rudimentary inspection of the mechanics of debt, these phenomena can be explained quite convincingly.

We can see from the ascendant curve in Figure 1.4-5 that the private sector debt in the United States is not something to be trifled with. It currently stands in excess of the sum of physical and digital money by a comfortable margin. Scrutiny of a rising trend line on a graph however is not the whole picture. We must analyse what ramifications this simple line has on the society as a whole.

How do private companies operate differently under this shared debt load? Michael Rowbotham calls the paradigm of a heavily debt laden private sector 'operating from insolvency'. Firms operate from insolvency due to the fact that they are riddled with debt in various forms. In order to outrun this debt, a firm's profit motive becomes bloated by self preservation rather than solely self interest, leading financial institutions to constantly strive towards trading more and more to escape collapse. Rowbotham writes:

"Although they tend toward monopoly power, there is intense competition between MNCs [multinational corporations]. This competition involves not just the battle for sales, but the sheer survival of the companies involved. Even the largest corporate businesses are usually up to the hilt in debt, work on the slimmest of margins, operate virtually no financial surplus, and are constantly forced to raise money against their assets, and pay out dividends to their shareholders." [17]

Debt economics significantly amplifies the potential for the destabilising collapse of large firms, rendering such firms much more vulnerable than they may seem at a glance. Think of the Chapter 11 reorganisation filings which befell U.S. firms such as automotive giant General Motors in 2009^[18], telecommunications corporation Worldcom in 2002^[19] or other notable corporate entities. Collapse of large firms within a debt backed economy is relatively commonplace, surprisingly so when considering how large and influential such firms often are.

This is perhaps a difficult note to grasp, as conventional study typically reports that American business bankruptcy rates have been in sharp decline ever since the meteoric economic growth of the 1990s. However, the actual data reveals some surprising truths when interrogated in greater depth.

In a 2005 report from the California Law Review, entitled *The Myth of the Disappearing Business Bankruptcy*, Professors Robert M. Lawless & Elizabeth Warren attribute the falling business bankruptcy rates to systematic bias as a result of the software system which is used to log the information. They conclude that a far higher business bankruptcy rate is very likely, but is being masked by erroneous classification as consumer bankruptcy^[20].

Figure 1.4-7 shows how the number of businesses which are reported by the U.S. Small Business Association (SBA) as entering liquidation does not line up at all with the falling number of bankruptcy filings. Indeed, the fact that of the top 20 largest filings for Chapter 11 reorganisation, all but 3 have occurred since 2000^[21] does not seem intuitively consistent with an economy where bankruptcy rates are consistently falling. Elsewhere in the world, bankruptcy statistics under a debt economy are clearer cut. Figure 1.4-8 shows a substantial net increase in the number of UK businesses filing for insolvency each year since 1960.

However, this progression is merely an expression of how the debt economy develops a pattern of exacerbated insolvency; it says nothing of how this increased threat of insolvency interacts with the economy. If the vast majority of firms are laden with debt, and their only income arises from sales of goods and services, then they must understandably sell at prices higher than they would under debt free circumstances.

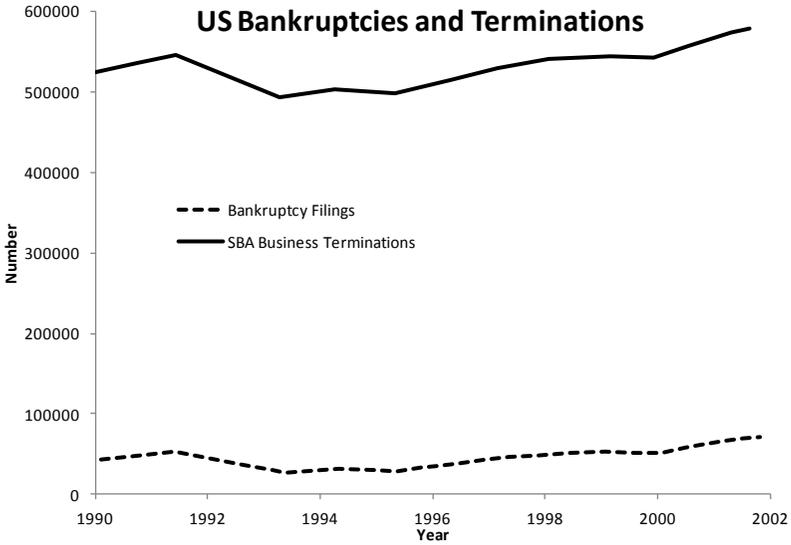


Figure 1.4-7: A plot of the discrepancy between the U.S. bankruptcy rate (courts) and the actual business termination rate. Plotted by author from [22], encompassing data from U.S. Dept. of Commerce, Census Bureau; Administrative Office of the U.S. Courts; U.S. Dept. of Labor, Business Employment Dynamics

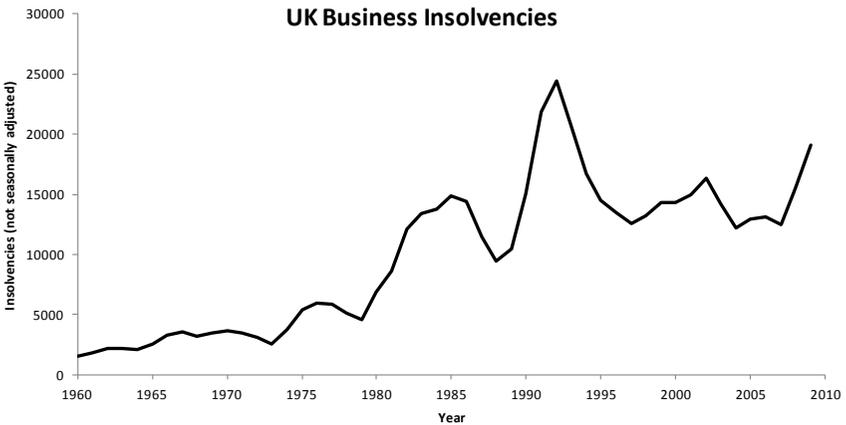


Figure 1.4-8: Company liquidations in England and Wales (seasonally adjusted) - Plotted by author using data from [23]

As we have seen from chapter 1.2, the consumer is also the employee, so in order for the consumer to be able to buy the higher priced goods, they too must be paid higher wages. Paying higher wages while selling at higher prices is however a zero sum game, as the firm income is then inadequate to service the debt.

Therefore, to remain afloat it is necessary to sell at higher prices than wages. In isolation this seems harmless, however it should be considered that the vast majority of firms across the spectrum are subject to the same debt economy, and must thus follow the same principle. The result of this is a population which ultimately does not have the purchasing power to buy the goods which it produces^[24].

An economy where purchasing power is depressed in such a way is intrinsically unhealthy, as ultimately the integrity of the consumption cycle is undermined. Debt collapse of firms is more likely when competition for sales is artificially intense. The ability of individuals to acquire necessary goods is also hindered by prices driven higher by industrial debt.

Quality and craftsmanship become depressed as purchasing power inadequacies force consumption to skew towards so called 'budget' products. Unhealthy, processed food, throwaway appliances and generally poorly constructed products become more profitable and more desired in the debt economy.

Figure 1.4-9 also shows that it is not just business which suffer under debt economics. The number of insolvencies in England and Wales (both voluntary and involuntary) has risen by a considerable margin. Also notable in Figure 1.4-8 and Figure 1.4-9 is the fact that before the 1981 implementation of the 'voluntary' reserve ratio, the growth in insolvency was considerably less severe.

In both cases the bulk of the bankruptcy increase occurs after this event. This is not to say that the event can be pinned down as a trigger for increases, but it seems relevant that abolition of a reserve requirement is consistent with the data available. In addition, these trends are scrutinised over long periods of time suitable to dismiss them as micro trends within a larger progression.

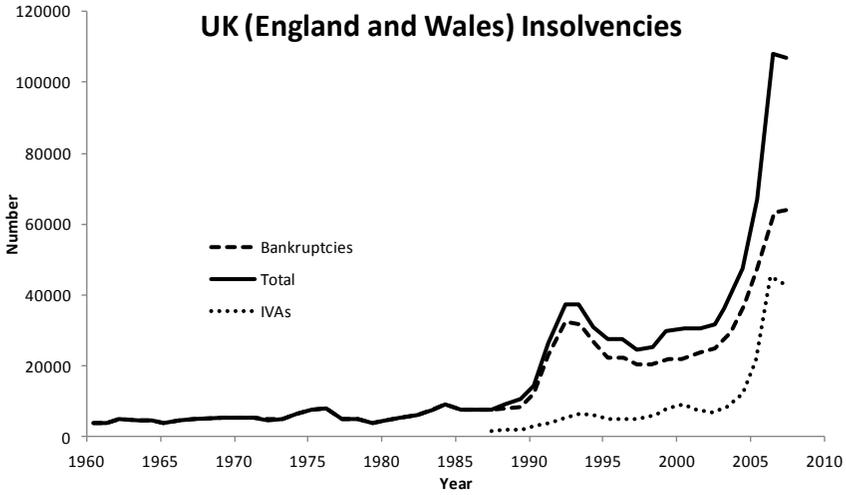


Figure 1.4-9: Plot of personal Bankruptcies and IVA (individual voluntary arrangements) in England and Wales, 1960-2010 - Plotted by author from [25]

Further light is shed on the effect upon the population under this debt load when analysing the trend of savings. Figure 1.4-10 shows that savings in the UK have fallen drastically, and are currently at a negative rate, meaning more money on average is being loaned out, rather than saved.

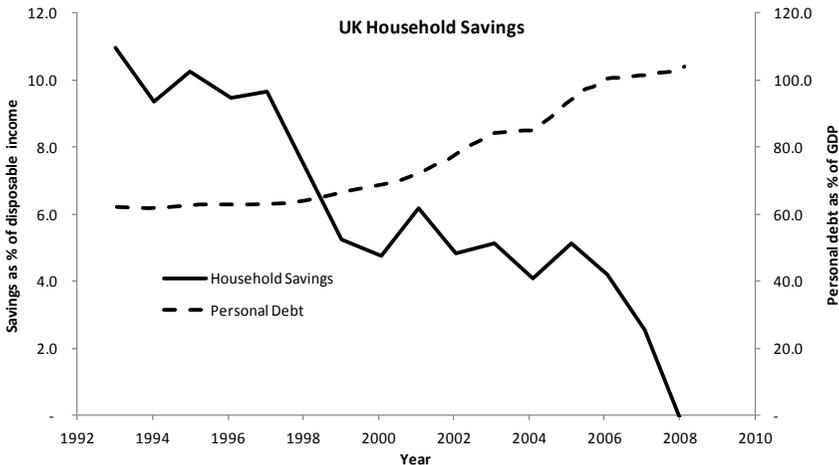


Figure 1.4-10: Plot of total personal debt (as percent of GDP) versus total personal savings (as percent of GDP) - Note that around 2008, the saving percentage actually becomes negative, meaning that the aggregate of household savings is actually a deficit. Data originally traceable to [26]. Graph adapted by author from [27].

With personal debt levels and personal insolvency rates both high, and personal savings low, it is difficult to argue that the explosion of debt within the economy has had anything other than a detrimental effect on both personal wellbeing.

Inflation

The smoking gun of debt finance is manifested in a word that is under our noses on a daily basis. We hear it on the news, in the papers and in open discussion amongst our brightest and most economically aware. Yet no one stops to question why our money supply is inflationary. Very little thought is given to the reason why these seemingly arbitrary percentages are thrown around in the public forum, and what they actually signify.

The UK target rate of inflation is held at 2% (give or take a percent) which seems like a nice number. Yet what this actually signifies is that each year, the government aims for the money supply to be increased by 2% through bank based money creation. In the invalid conception where government still 'print' their own money, the public would be forced to believe that new money is continuously being printed at a voracious rate.

However, the view that inflation is caused by governments manically 'printing' more money is the encapsulation of the neoclassical quantity theory of money. In basic terms, this theory posits that an overabundance of money results in a gradual drift of consumer prices to meet this surplus. Hence the supply of money available to an economy has a direct effect upon the prices within it.

Is this however what we are seeing in the global economy? Is there simply too much money floating around and too few goods to spend it on? Sustained and growing inflation has been the mainstay of economic doctrine for decades (see Figure 1.4-11), yet we are to believe that it is because there is too much money available?

The trend in Figure 1.4-11 also seems to correlate nicely with the explosion of debt which has characterised the 1970s onwards. Could it possibly be that debt is the governing force behind the inflation phenomenon too? Debt certainly is pertinent to the situation, as the nature of interest driven money scarcity constantly truncates purchasing power and necessitates further borrowing, and thus further expansion of the money supply. This is simply not considered in conventional economic theory.

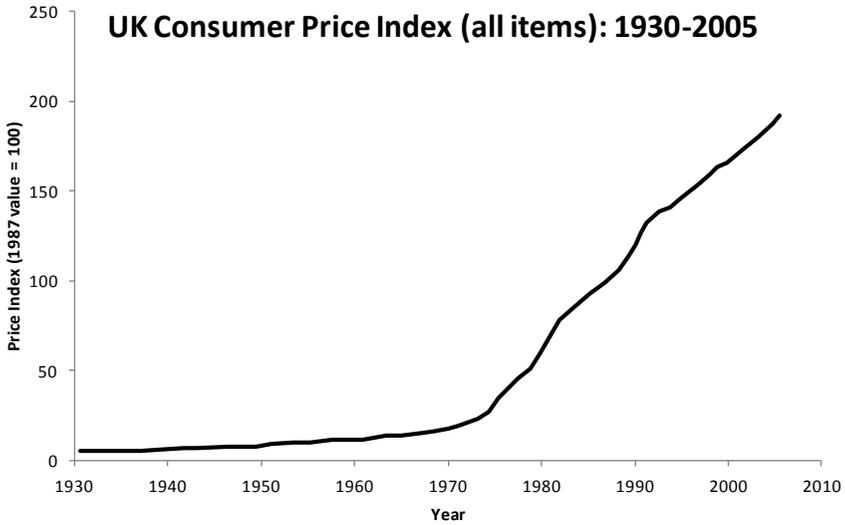


Figure 1.4-11: UK consumer price index (CPI) over time. The CPI is a statistical estimate constructed using the prices of a sample of representative consumer items. The CPI is used as an estimate of effective inflation viewed by the consumer. Data plotted by author from [28]

Conversely, conventional solutions to high inflation actually often worsen the situation. An increase in interest rates is the most corrosive of these measures, as efficiency driven increases in wages are misconstrued with quantity theory's belief that there is "too much money". Interest rates are raised, magnifying debt to suck the excess money out of the economy. This interest driven increase in debt however leads the economy into more borrowing; a vicious cycle of further debt and money scarcity.

Inflation is a prime example of where an overly complicated economic system is hurting livelihoods simply because of a lack of fundamental understanding amongst those who govern it. Debt financing is the sole cause of inflation. A system operating a currency which is backed by tangible assets rather than debt is inherently non-inflationary, because it has no need to be. Inflation is driven by the chronic requirement for more money to service the debts from which the money is borne. It is most certainly not driven by people on average being too wealthy and prices attempting to catch up, and a cursory glance at statistics would confirm this.

Furthermore, governments printing more money does not necessarily lead to inflation. Nowhere is this better demonstrated than in the national deficits of three of the largest global economies in the 1970s to the 1990s, as shown in Table 1.4-1.

Country	National Debt Growth (% of GDP)		Average Inflation (over period)
	Beginning of period	End of Period	
Germany	18%	64%	3%
Japan	11%	75%	5%
USA	28%	82%	5%

Table 1.4-1: General trends in national debts and average inflation rates for Germany, Japan and USA, 1970s through 1990s. Tabulated by author from [29]

Despite enormous sovereign deficit financing, injecting essentially debt free money into the economy, the inflation of these three nations was the lowest in the world. By contrast, the UK slashed its deficit and reduced the national debt from 77% of GDP in 1970, to 39% of GDP in 1990^[29]. The effect that this tightening of the belt had on the UK inflation rate is marked, as demonstrated by Figure 1.4-12, the average over the same period stands at between 9% and 10%.

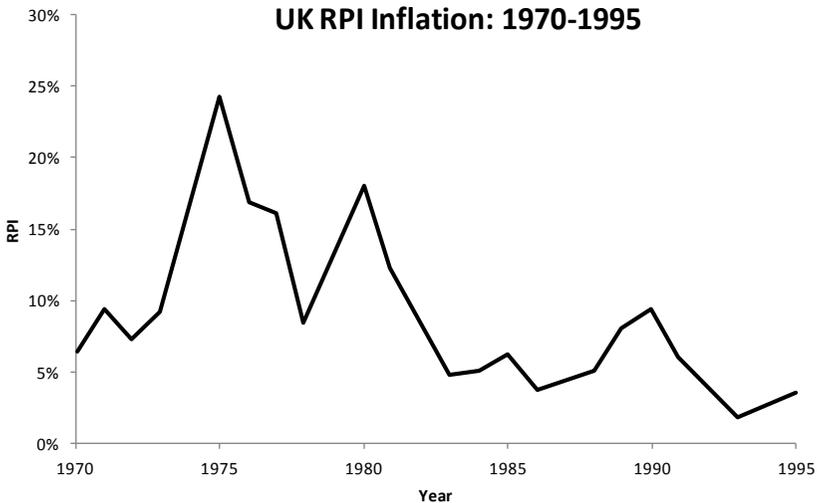


Figure 1.4-12: Plot showing the RPI (retail price index - another, UK specific measure for inflation) over the general 1970 to 1990 period. Note that during this period, the UK government did not introduce ('print') new currency into the money supply though national debt financing. Despite this, inflation remained significantly higher than in the nations which did - the opposite of what quantity theory suggests - Graph plotted by author using data from [30]

It is almost obvious to suggest that the low inflation observed in economies which have been injected with national investment, is because the money injected is essentially debt free. Governments who increase their deficits can indefinitely shoulder the burden of their debt, while temporarily allowing debt free money to circulate within the economy, reducing dependence on inflationary borrowing.

Governments who do the opposite, and attempt to pay off their national debt, siphon liquidity out of the wider economy, and thus drive it into private borrowing, which increases overall debt and prompts a greater inflation of the money supply. Quantity theory cannot explain such statistics, as it posits that the exact opposite of this should occur.

Furthermore, the existence of the clumsy portmanteau of 'stagflation' presents an additional difficult question for the quantity theory to address. How can economic stagnation, slumped economic growth and "too much money" be coexistent? The fact is that they demonstrably can't, and quantity theory simply cannot account for its existence at all. As with many other neoclassical economic theories (as we will see), quantity theory is a completely unsound basis for policymaking.

So if the quantity theory is so unanimously wrong on all fronts then where do we go from here? The fiscal theory of price levels is one such alternative, and states that fiscal policy and government spending patterns are the only important factor in inflation*. This seems intuitive, as the deficit behaviour of the UK, Germany, Japan and the USA from the 1970s onwards seems to have a strong effect on inflation.

However the fiscal theory again predicts circumstances in the exact opposite direction, and states that deficit spending is what *causes* inflation. A amazingly a paper from the University of Cardiff attempts to reconcile this theory with the aforementioned 1970s period in Britain.

The paper states that the decade which brought rampant privatisation and the 'winter of discontent' was a "*period in which the government greatly increased public spending without raising taxes and monetary policy was accommodative.*"^[31] It does not take a great deal of analysis to fathom that this was simply not true, as shown in Figure 1.4-13 by the sharp decline in funding

* *Staunch disagreement between economic philosophies is commonplace. A paper by the Federal Reserve of St Louis outlines the irreconcilable differences between the fiscal theory of price level and the conventional monetary based theory (quantity theory)* ^[51].

for public corporations and local government across the latter half of the decade. Indeed, by 1980, spending was around 10% lower than in 1970.

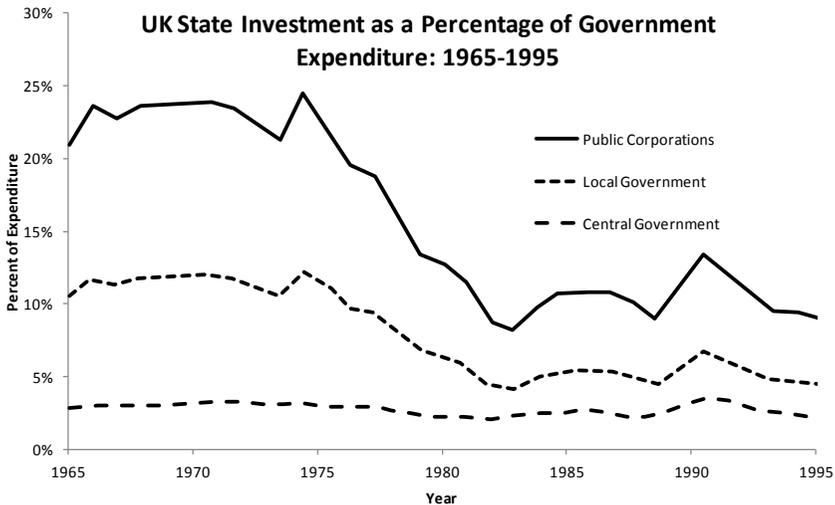


Figure 1.4-13: Plot of government spending levels as a percent of overall government expenditure. Note the decline over the 1970s decade is inconsistent with the fiscal theory of price levels - Data taken from [32]

What their report essentially shows is that the opposite is true. A state which *does not* spend deficit money into the economy leads to inflation. Fortunately, other heterodox economic theories stand less steadfastly ignorant of uncomfortable truths. The Real Bills Doctrine of inflation theory maintains that money created with suitable backing is inherently non-inflationary. Michael Sproul of the University of California states that;

“Economists all recognise that a corporation can increase its outstanding shares of stock by any amount, and as long as the new shares are adequately backed by new assets, the value of the stock will not fall. For this reason nobody would claim that the quantity theory applies to corporate stock.”^[33]

The point to draw out from Sproul's statement is that our money supply is *not* adequately backed. It is backed with a debt greater than the principal, which inherently demands more money to be created. The Real Bills Doctrine is therefore half correct, as inadequate (such as debt) backing does lead to financial inflation. However the opposite side of the coin which the doctrine professes is that injection of money which is not backed by tangible assets leads to inflation.

Again, returning to our four country scenario, the money provided to the economy from 1970s to the 1990s by the three nations who ran into their deficits was not adequately backed. It was instead backed by the indebtedness of the government. However, the debt against this money was not felt by the economy over the period of injection. The deciding factor here is not the backing of the money, but the burden of the debt against it. If a money supply is subject to a growing debt burden, it will, by necessity, become inflationary, as it fundamentally must inflate in order to prevent the growing debt consuming the supply.

National Debt

As alluded to previously, a sovereign state may borrow money from its central bank in order to inject money into the economy, by budgeted investment into public or private enterprise. Infuriatingly, this action of borrowing money into existence by the government is one of the few aspects of debt financing which is discussed in the media, despite the fact that it should be considered the most benign.

As we have seen, the inflationary properties of the economy under a campaign of government debt financing are generally positive. The debt burden is shouldered by the state, allowing an essentially debt-free liquidity injection into the economy. However, the problem of national debt comes from the fact that economic policy bizarrely dictates that the state is required to pay back the money that it has borrowed from its own central bank.

The irrational fear of hyperinflation, driven by the erroneous quantity theory of money has created a situation where governments are unable to print their own money, and must instead loan it into existence from a semi-autonomous, central banking entity. While this money appears debt free from the point of view of the economy, the state itself is expected to pay the loan back at interest to the central bank.

However, by running large deficits year on year, and allowing national debts to grow, governments *are* essentially printing their own money, from the perspective of the economy as a whole. The total amount that has been loaned from the central bank to the state is not a value which realistically holds any meaning, it is simply a running total of the liquidity injected into the economy in order to counteract the private debt burden. It is therefore damaging to the economy as a whole, when absurdly large national figures (regularly in the trillions of U.S. Dollars) become policy talking points and are expected to be paid back by the state in question.

In order to pay back the national debt, the state must either embark on a campaign of austerity, in which state spending is drastically cut back, or stimulate growth and tax the private sector, such that state revenue rises. In both cases, the result is a shift of responsibility for monetary creation back to the private sector, and a withdrawal of debt-free money out of the economy and into the central bank coffers. As we have seen, when states do this, the inflation of the money supply is regularly much higher than when they burn budget deficits and run up the national debt, due to the shift of the debt burden directly onto business and households.

But the poor understanding of the interdependence between interest rates, and private and public debt burdens is just one factor here. The process by which national debt accrues is also a mind bending exercise in financial gymnastics, which ultimately has never been fully justified by mainstream economic theory.

The process starts off fairly sensibly; the state central bank draws up bills, stocks and bonds to auction off to the monetary markets (banks, companies, investors etc). These bonds are attractive to investors as they promise to return a higher value at some point in the future. From the sale of these bonds, the state gathers cash required to make up any shortfall between budgeted expenditure and income (taxation).

As the stocks mature, the state must pay the promised return to the institutions that purchased them, however, this is where things begin to get absurd. If the state cannot raise enough revenue from taxation in order to pay the promise of the bonds, then the only course of action is to pay off the matured stocks by issuing new stocks. The lunacy of this position should be apparent to anybody; the state pays off its loan, by taking out another loan.

This leads to what is often misleadingly referred to as the 'interest' on the national debt. In reality, this is not actually interest in the way that an individual is charged interest. It is instead a never ending deferral of repayment, by constantly taking out loans to cover existing loans. This grows the national debt, but also grows the deficit between state income and expenditure, therefore giving an illusion of an interest component.

Perhaps even more confusingly, the above process is understood by many economists as absurd, and is such dismissed as a peculiarity of the marketplace which does not really hold any meaning. Alfred Roman Ilesic in his book *Government Finance and Fiscal Policy in Post-War Britain* referred to the national debt as "*something which owes itself*"^[34], while Francis Cavanaugh in

The Truth About the National Debt argued that, because the public owns the treasury securities which make up the public debt (directly or indirectly), the debt is offset against itself, and therefore is not a burden^[35].

However, these economic rejoinders are fallacious for a key reason; the political establishment *does not* view the national debt as 'something which owes itself', it views it as a serious issue which requires drastic measures to solve. At time of writing, Europe is still gripped in the throes of austerity, as government officials embark on a panicked slashing spree to minimise public spending. The USA is also not immune, and is currently engulfed in crisis talks surrounding the so called 'debt ceiling'.

It is no use to label the national debt as a triviality if it is treated as an issue with the utmost importance. Of the officials who hold the reigns of the state and its debt burden, it is clear that so few actually grasp the functionality of what they are in charge of. Furthermore, their economic advisors seem to do no better in giving theoretical explanations of why such a debt accrues in the way it does.

However, we must perhaps spare the blame from the individuals themselves and instead focus on the sheer mania of the system at play. As absurd as the manner in which modern private banks create money, the creation of money at a state level is a higher echelon of abstraction and convolution. Politicians must indeed wonder how members of their population live in the most abject poverty, while at the top of the ladder, the state is simply creating money from loans upon loans upon loans. It is therefore unsurprising that so many fail to grasp the meaninglessness of such an abstract and needlessly complex process of money creation.

Looking Elsewhere for Answers

In order to balance the argument, other methods of money creation theory beyond the scope of mainstream economics must be considered. In addition, other possibilities to explain the global debt paradox must be perused. It must be considered that not all economists fully subscribe to the mainstream, banking oriented view on the creation of money.

These differing views generally come in the form of an endogenous rather than an exogenous creation process taking place in the economy; that is, creation of money within the economy itself rather than by a third party (central bank) from outside of the economy. So, it is perhaps relevant here to 'teach the controversy' so to speak, and see if endogenous money creation theories fully explain the

trends that are being observed with less bleak prospects for the future of modern economics.

One such variety of endogenous money creation comes in the form of Chartalism, which draws its name from the Latin *charta*, meaning token. Chartalism describes the process of money creation as a result of governmental control over what can be accepted as payment of tax, i.e. money is simply a token (*charta*) rather than a commodity of value^[40].

Analysing the historical origins of money, this viewpoint seems to ring true to some degree, as shown by historical study. Grierson (1977)^[36] Goodhart (1998)^[37] and Wray (2003)^[38] theorise that money's origins lie in reparation or indebtedness to a victim of crime or wrongdoing, based on ancient penal code. With the origin of the state, these practises would be collected and compiled into an intricate web of other payments and obligations, which formed the basis for modern state imposed taxation and fines.

Hudson (2003)^[39] partially supports this view, showing how Mesopotamian institutions would log accounts of debt and credit based on an irreducible unit of account; the basis for the concept of currency. This currency predates market activity, and so by default predates its use as a medium of exchange. As such, money emerged as a method for the state to empirically measure its own functionality by accounting the quantity of goods in surplus or deficit at any one time. This approach aids in the explanation of why valueless objects have been used as money in antiquity, such as clay tablets, tally sticks, feathers or seashells^[3].

Chartalism thusly begins to shed light on the accumulation of national debt, as in order to have justification for taxation, a service must first be provided. This initial service is the provision of money to the economy; money which is created out of thin air and creates a somewhat abstract initial government deficit.

If the tax demanded from the populace to satisfy this deficit is equal to the spending then the nation and the economy is left with no money post tax. This therefore leads to the necessity for a government deficit in order to maintain a supply of money to the nation. This deficit is however of no consequence, as the government runs the money supply and as such is both debtor and creditor in this transaction.

It is therefore impossible to bankrupt that which can create its own money. According to Bill Mitchell, Professor of Economics at Newcastle University:

"...the federal government now issues debt to the private markets via an auction system \$-for-\$ with net government spending (deficits). This allegedly imposes "fiscal discipline" on the government (it is totally unnecessary from a financial perspective) because the rising debt becomes a political issue. In conclusion, much of the deficit-debt hysteria that defines the current macroeconomic debate is based on false premises about the way the monetary system operates and the financial constraints on government spending."^[41]

This viewpoint essentially agrees that the national deficits and debts of countries around the world are meaningless tallies; a functional necessity within a state system. However, as Mitchell mentions, the fact of the matter is that this debt is not being treated as a functional necessity, and causes often misplaced political concern to reduce it.

This is however only one piece of the puzzle, as money within a chartalist system has two components; vertical and horizontal money. Vertical money represents the aforementioned component of the economy, that is the creation of money by the government to supply said economy. The horizontal component of money represents private loans provided by the commercial banking sector. This generation of money is largely identical to the method described in the fractional reserve banking section; however endogenous monetary theory offers some different interpretations on the nature of this process.

While horizontal money is considered secondary to vertical in chartalism (due to the acknowledgment that the private credit cancels against a debt) however, Graziani's monetary circuit theory allows horizontal money to take centre stage. Circuitism, as it is known, posits that;

"...a taxing government is a sufficient but not a necessary component of a monetary system. Money, defined as a unit of account whose transfer is accepted as final payment in all commodity and service exchanges, can exist in the absence of a taxlevying state..."^[42]

According to circuitism, the money is borrowed into existence from a bank by an employer. This employer is able to produce goods or services by employing workers, who in turn act as consumers to buy the goods produced. This then allows the employer to repay debts, closing the monetary circuit. This view,

while simplistic, has been shown to account for the complexities of the marketplace, and be consistent with Post-Keynesian viewpoints^[49].

However, this perfect circuit omits the payment of interest and assumes that all the money which is paid as wages is re-spent. Thus the problem of interest repayment emerges, which circuitists fully recognise as troublesome to this school of thought*. This is in keeping with the observations made thus far, that debt outstrips the money supply, due to the inability for the money supply to provide sufficient funds to pay interest.

Economist Steve Keen has however taken an opposing view to these conventional circuitist teachings, stating that the apparent inability to pay interest arises from the confusion between a monetary stock and a flow over time. This basically means that while loans are extended to firms to employ workers, the wage bill is not deducted from the account of the firm instantaneously, but instead seeps out over time.

This therefore allows the employer to pay workers total annual wages which sum to greater than the initial loan, allowing positive employee bank balances. This ability to pay workers more than the loan is a result of the firm using the bank loaned money to trade and generate profit^[43].

Keen views the money multiplier as a causal misrepresentation, calling up the fact that when the U.S. government injected money into the economy via quantitative easing (selling off assets to banks to generate money), the available money failed to multiply in the way that conventional economics suggests it should.

This view is corroborated by Leeper, who found that the liquidity effect did not consistently perform in the manner expected^[50]. This is depicted in Figure 1.4-14 and Figure 1.4-15. The argued reason for this failure is because the multiplier implies that there is an infinite demand for loans, i.e. any deposit in a bank reserve will be used to raise a loan against it^[46]

* *Graziani concedes; "[...] even in the most favourable case, the firms can only repay in money the principal of their debt and are anyhow unable to pay interest."*^[42]

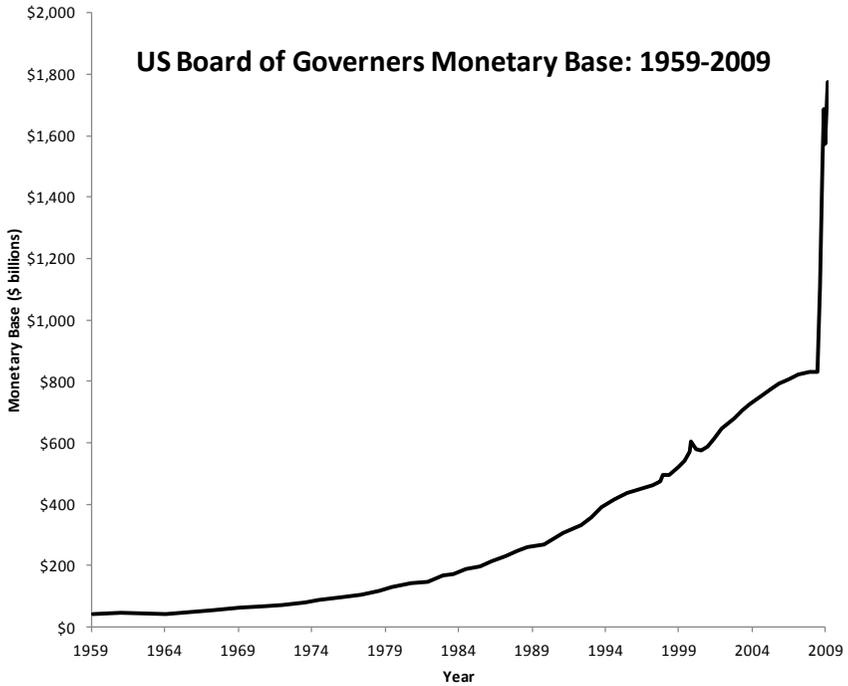


Figure 1.4-14 - Progression of U.S. monetary base: 1959-2009 - Adapted by Author from [44]

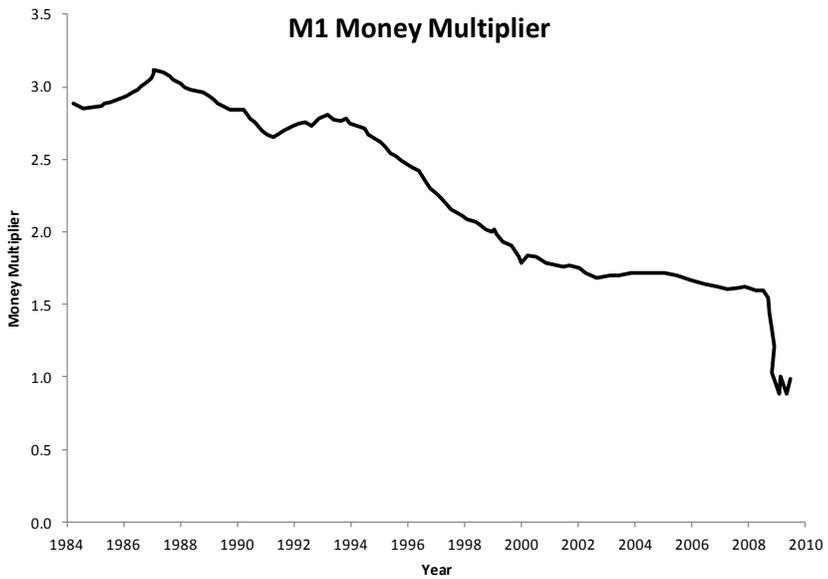


Figure 1.4-15 - U.S. Money Multiplier ratio: 1984-2009 - from [45]

Endogenous and heterodox economic theory does shed a great deal of light upon the problem of the debt economy. It proves quite convincingly that the problems observed in society due to the ubiquity of debt are a result of cumulative errors on the part of policy makers, adding weight to Rowbotham's 'conspiracy of error' argument^[47].

Chartalism makes it quite clear that governmental debt is a natural and indeed unavoidable side effect of running a financially healthy economy. Circuit theory on the other hand shows us that the spiralling accumulation of debt is due to the inept and oversimplified modelling of the economy by the neo-classical economic school of thought, and the erroneous policies which its proponents advise. Through careful and well thought monetary and political reforms, it is incredibly feasible to create an economy which is devoid of debt induced instability, and the associated hardships which come with it.

It is perhaps a further commentary on the need for fundamental change when many professional economists do not fully understand the mechanics of the system around which their profession is based. If the system is so abstract and complex that academia has trouble grasping even its most basic functionality, then what hope does the general population have when living under its dynamics?

Furthermore, what chance does the population have in furthering their own prosperity in an effective manner, when faced with the choice of conflicting political policies to progress society? The modern economy is a remarkably complicated and intricate system, but this is not a good thing; conversely it is deeply damaging to our ability to progress, as misplaced or incorrect proposals for change do much to cause harm to societies around the world.

But the lack of formal understanding within economic circles is not just a result of ineptitude; it is a symptom of a far wider issue within human civilisation. Criticism of the inadequacy in economic theory is all well and good, but the root of the debt issue finds its place within the simple market incentive system, as we will see.

The chaotic origins of the marketplace, and the cumulative effect of the incentives which drive it are destined to result in such macroscopic irrationality. This is the primary topic for chapter 1.9, but it will also be expanded upon briefly in the next subsection.

We should therefore obviously criticise the mechanics of debt financing, but not through obstinate finger-pointing at institutions for "getting carried away" and "making poor choices". In order to spare the global community of more hardship in the future, it is imperative that the problem is recognised for what it is; a systemic disorder, driven by market incentives, rather than a case of some bad apples messing it up for everyone else.

Conspiracy or Otherwise

The idea of a centralised institution enforcing debt-based fiscal policies upon a population is one which has historically been seen as somewhat conspiratorial. However, as we have seen, the institutions which indulge in such processes are anything but central, and are certainly not secretive about taking such measures.

The notion that "they" are behind this oppression of "us" falls into the fairly juvenile oversimplification upon which conspiratorial thinking is often based. Equally juvenile however are those on the other side of the argument, who dismiss anything which may be tinged with unorthodoxy as inherently conspiratorial in itself. This leads us to the inevitable question; how did a system which generates more debt than money come into existence?

Without stepping on the toes of chapter 1.9 too much, we can answer this question relatively simply. While there certainly are institutions and individuals who benefit from a debt laden society, and will fight to keep it that way, there is a more overarching explanation here. The root of debt proliferation through the global economy is twofold; it is a commentary on the point at which human civilisation currently finds itself, and, simultaneously, a textbook case of collective irrationality.

A system which produces both money and debt at an exponential rate reflects something very important about the underlying circumstances and assumptions. It implies not only that the future will be bigger and better than the present, but that the future will always be bigger and better than any present. We must recognise that our exponential growth as a population, and the construction of an economy centred on exponential growth is intrinsically interwoven with the drawdown of cheap fossil fuel energy, and the assumption that this short term energy solution is a long term one.

Not only is this process a reflection of the market incentive's ignorance of long term phenomena, but it is also a reflection of the self directed and individualistic pursuit of value, as will be explained as follows. The loaning of money into

existence is a self directed process. It is not simply an action of the Federal Reserve or any other conspiratorial central bank, and does not end there.

Every bank in existence today follows the fractional reserve banking policy in some form, and the reason for this is that this process generates profits through interest. Fractional reserve lending is a policy of absolute value maximisation, which must be adhered to if a banking institution is to remain competitive within a marketplace.

This bizarre situation means that the money which we use to pursue market incentives within our economy is in itself *monetised* market incentive. The money in your purse or wallet exists because a bank loaned it into existence in order to make more money. The representation of absolute value in the economy exists because banks loaned it into existence to maximise absolute value.

Notice that this policy on behalf of the banks is entirely rational and in-keeping with any profit maximisation mechanism utilised by any other business. As we will see in chapter 2.2, one of the defining principles of many mixed motive games and real world scenarios is that the aggregate of individual's rational decisions often delivers results which are irrational on a wider scale* .

This could not be more relevant here, as the rational actions of lending institutions have created a world where debt exceeds money. As stated previously, this irrationality is masked by the exponentiality of the crude oil backed economy, and the infinite expectation that the future will deliver more growth, more prosperity and more resources.

This view of debt growth as a fundamental side-effect of self directed market principals is echoed through historical evidence. Our most early records of complex financial accounting take us back to ancient Mesopotamia, and the earliest of mankind's agrarian civilisations. Mesopotamia also holds clues to the history of debt, and more importantly, the uncontrollable growth of debt.

What these ancient civilisations show us, is that not only did debt exist and proliferate, but it also was relatively commonplace for debt to be cancelled en

* *For anybody struggling with this concept, look at it this way; there would be no problem if a single bank loaned money into existence in order to generate interest based revenue. If this occurred, the debt and interest could readily be paid off by the much larger stockpile of physical money. The issue here is that all banks are loaning money into existence, thus the economy becomes populated almost entirely with money that is backed by debt - the rational individual choice (to make money through loans) results in an irrational outcome (debt exceeding money) when every bank does it.*

masse. Historian and economist Michael Hudson has presented evidence of debt cancellation as far back as 2400 BC in Sumer. Historians have also identified with certainty around thirty other general debt cancellations in Mesopotamia between 2400 to 1400 BC*. Hudson has argued that general debt cancellation was one of the principal characteristics of Bronze Age societies in Mesopotamia, and is also evidenced in many other ancient civilisations, most notably in Egypt, as described on the Rosetta Stone^[48].

So is debt jubilee the answer? A systematic wiping out of the debt, and a reset back to zero? There are many lobbies (such as Debt Jubilee UK) who are pushing for such a thing, no doubt in the way the ancient Sumerian did so many years ago. However, history has shown us convincingly that resetting the debt clock is simply a temporal solution to a systemic problem. Eventually, the debt clock will have to be reset again, and again, and will continue to require periodic reset until a more sustainable manner of monetary creation is built in its place. I, for one, do not see this as an effective solution.

Conclusion

Linking back to our broad question for this part of the book, we must peruse whether the unsound foundation of money represents a reason to change, and what benefit this system actually serves for humanity.

As we have discussed, we can quite comfortably label the action of the creditor to extend credit as a manifestation of the self directed market incentive. This action is harmless in itself, but becomes deeply damaging when aggregated at a macroscopic level. History shows us that the marketplace and debt expansion go together hand in hand. This is not the action of conspiracy by a shadowy cabal, but is instead a natural extension of the individualist nature of the marketplace.

This is where the reader must assess whether the abstract and convoluted method of money creation through loan extension is a good model for accounting for value. As history as shown, such a system can work to a degree of satisfaction in the long term, so long as debt jubilees are invoked with some regularity, and the slate wiped clean to start from scratch.

I would argue that such a degree of complexity and vagueness in the process of money creation is fundamentally not a good thing, due to the sheer unwieldiness

* *There are no records of debt cancellations after 1400 BC. Perhaps tellingly, post 1400 BC, Mesopotamia fell into what is considered a 'Dark Age', in which writing was scarce and slavery was rife. Of what writings we do have, there is evidence of violent struggles between social classes.*^[48]

of the system, and the damage that this can do to the financially insecure. While the system is indeed an outgrowth of the market incentive, its complexity is a testament to the chaotic underbelly of such individualist systems, and why they must be used with caution. Furthermore, the historical requirement of a system to be periodically reset to zero, only to inexorably grow to uncontrollable levels again in the future seems self-defeating to some degree.

Additionally, a system in which a rolling reset of debt is applied remains grievously unfair and damaging at both social and environmental levels. This is because in order to get to a point where debts are cancelled, civilisation must live through a period which characterises all the hallmarks of a debt backed economy.

This means that regardless of the eventual clearance of debt, society must weather the storm of social injustice, depressed purchasing power, inefficiency, and artificially intense competition between firms. In a civilisation which command most of the world's resources at its fingertips, and can readily kick out enough pollutants to effect the integrity of the environment on a large scale, such an era of wastefulness is not an option.

The role of debt in our economy is an inefficient, abstract and damaging phenomenon, which arises intrinsically from the market incentive system. I argue that given the evidence presented within this chapter, the presence of debt and its usage in the modern economy is a strong argument for the need to shift away from the market paradigm.

Chapter 1.4 - References and Notes

- [1]. R. D. Richards, *Early history of banking in England*. R. S. King, 1929
- [2]. David Stuckler, Christopher M Meissner, Lawrence P King, *Can a bank crisis break your heart?* Springer Science+Business Media – BioMed Central 4, Jan 2008
- [3]. Glyn Davies, *History of Money: From Ancient Times to the Present Day*, University of Wales Press; 4th Ed edition, 2010
- [4]. Federal Reserve Bank of Chicago, *Modern Money Mechanics*, 26 Sept. 2011
- [5]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pg307
- [6]. Jire Sekar, *Death of M3: The Fifth Anniversary*, Mises Institute, December 8, 2010 - <https://mises.org/library/death-m3-fifth-anniversary>
- [7]. Data taken from Board of Governors of The Federal Reserve System - Data Download Program - <http://www.federalreserve.gov/datadownload/>
- [8]. European Central Bank (ECB) - Eurosystem - Historical Statistics - <http://www.ecb.europa.eu/stats/services/downloads/html/index.en.html>
- [9]. Data taken from Federal Reserve Bank of St. Louis - FRED - Economic Research - <https://research.stlouisfed.org/fred2/graph/>
- [10]. Data taken from Bank of England - Statistical Interactive Database - <http://www.bankofengland.co.uk/boeapps/iadb/>
- [11]. Norbert Janssen, *Publication of narrow money data: the implications of money market reform*, Bank of England Quarterly Bulletin: Autumn 2005
- [12]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998, pg88
- [13]. Diane Doyle, *Economic boom is longest in UK history*, The Independent, 20 January 2000 - <http://www.independent.co.uk/news/business/news/economic-boom-is-longest-in-uk-history-727514.html>
- [14]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998, pg25
- [15]. Yueh-Yun C. O'Brien, *Reserve Requirement Systems in OECD Countries*, Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, D.C. July 23, 2007, pg3
- [16]. Brian Southall, *The Rise and Fall of EMI Records*, Omnibus Press, 6 Jul 2009

- [17]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998, pg 158
- [18]. *A Giant Falls*, The Economist, Jun 4th 2009
- [19]. Luisa Beltran, WorldCom files largest bankruptcy ever, CNN Money, July 22, 2002
- [20]. Robert M. Lawless & Elizabeth Warren, *The Myth of the Disappearing Business Bankruptcy*, California Law Review, Vol. 93, No. 3, 2005
- [21]. Data taken from <http://www.bankruptcydata.com>
- [22]. SBA - Office of Advocacy - Frequently Asked Questions Memo - Sept 2010
- [23]. Administrative records of the Department for Business, Innovation & Skills (BIS) Insolvency Service and Companies House Executive Agencies
- [24]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998, pp39-40
- [25]. The Insolvency Service (UK) - *Individual Insolvencies by Location, Age and Gender, England and Wales*, 2014, - Ins 15a/Coms/025 - 14 July 2015
- [26]. UK Office for National Statistics
- [27]. Tim Jackson, *Prosperity Without Growth*, Routledge, 2011, pg 23
- [28]. Data taken from Reuters EcoWin tool
- [29]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998, pg248
- [30]. UK Office for National Statistics
- [31]. Jingwen Fan and Patrick Minford, *Can the Fiscal Theory of the price level explain UK inflation in the 1970s?* December 2009
- [32]. Tom Clark, Andrew Dilnot, *Long-Term Trends In British Taxation And Spending*, The Institute For Fiscal Studies, 2002, pg15
- [33]. Michael Sproul, *There is No Such Thing as Fiat Money*, No 830, UCLA Economics Working Papers from UCLA Department of Economics, Sept 2003
- [34]. Alfred Roman Ilesic, *Government Finance and Fiscal Policy in Post-War Britain*, Staple Press, 1955
- [35]. Francis Cavanaugh, *The Truth About The National Debt*, Harvard Business School Press, 1996
- [36]. Philip Grierson, *The Origins of Money*, Athlone Press, 1977
- [37]. Charles A.E Goodhart, *The Two Concepts Of Money: Implications For The Analysis Of Optimal Currency Areas*, European Journal of Political Economy, Volume 14, Issue 3, August 1998, pp407-432

- [38]. L.Randall. Wray, (2003), *Functional finance and U.S. government budget surpluses*, in; E. Nell and M. Forstater (eds), *Reinventing Functional Finance*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, pp. 141–59.
- [39]. M. Hudson, *The creditary/monetary debate in historical perspective*, in; S. Bell and E. Nell (eds), *The State, the Market and the Euro*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, 2003, pp. 39–76.
- [40]. Philip Arestis, Malcolm Sawyer, *A Handbook of Alternative Monetary Economics*, Edward Elgar Publishing Ltd, 2008, pg70
- [41]. W.F. Mitchell (2009) *A modern monetary perspective on the crisis and a reform agenda?*, in; Wrightson, G. (ed.), *Labour Underutilisation, Unemployment and Underemployment*, Proceedings of the 11th Path to Full Employment Conference/16th National Conference on Unemployment, December, 213-230 [A precis of the paper is available at <http://bilbo.economicoutlook.net/blog/?p=5194>]
- [42]. Augusto Graziani, (1989). *The Theory of the Monetary Circuit*, Thames Papers in Political Economy, Spring, :1-26. Reprinted in M. Musella, & C. Panico, (eds.), *The Money Supply in the Economic Process*, Edward Elgar, Aldershot, 1995.
- [43]. Steve Keen, *The Circuit Theory of Endogenous Money*, Working Papers University of Western Sydney, Australia
- [44]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pg306
- [45]. Data taken from Federal Reserve Bank of St. Louis - FRED - Economic Research - <https://research.stlouisfed.org/fred2/graph/>
- [46]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pp308-310
- [47]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998
- [48]. M. Hudson, *The Lost Tradition of Biblical Debt Cancellations*, 1993
- [49]. Claude Gnos, *Circuit Theory As An Explanation Of The Complex Real World*, in; *Modern Theories of Money*, Rochon and Rossi (eds.), Elgar.
- [50]. Eric M. Leeper; David B. Gordon, *In Search of the Liquidity Effect*, Board of Governors of the Federal Reserve System, International Finance Discussion Papers, No. 403, July 1991
- [51]. Bennett T. McCallum; Edward Nelson, *Monetary and Fiscal Theories of the Price Level: The Irreconcilable Differences*, Federal Reserve Bank Of St. Louis, Research Division Working Paper Series, February 2006

1.5 The War of Technology and Labour

IN LIVERPOOL, THE CITY where I grew up, a great deal of its heritage lies concentrated in a relatively compact cluster, around the once prosperous waterfront. Once one of the great ports of the British Empire, the city was a hub for trade, growing its influence, in part, through its role in the North Atlantic slave triangle. Indeed, many books have been written about the history of the slave trade in Liverpool, and the opulent architecture which powerful slaver magnates bestowed upon the city. However, surprisingly little is written of the gigantic philanthropic contributions made away from the garish theatres of bygone trade and commerce. We therefore enter this chapter with the tale of one of these lesser known, and admittedly wildly eccentric businessmen.

The colourful character in the spotlight here is a gentleman who went by the name of Joseph Williamson, who was born of humble beginnings in 1769 but rose to prominence through the tobacco trade, and amassed a great fortune in the process. The background details of Williamson's wealth are not of crucial relevance here; what is of significance is what Williamson did with his fortune, particularly from 1805 onwards. It was in this year when Williamson purchased an unassuming outcrop of sandstone in southern Liverpool, upon which he began to build houses with little to no planning. He hired an army of workers to aid in this freeform building process, as well as instructing them to design audacious raised patios and gardens to compliment the new structures.

Williamson's bizarre folly did not cease when the land had been fully populated with structures. When space to build was exhausted, he began to pay his workers to move building materials back and forth, or to dig holes and then fill them up again. His folly even continued underground, excavating great tunnels beneath the houses and lining them with brick. The tunnels weave in and around themselves, covering a meandering subterranean area of unknown extent, but estimated to be many miles. There are large, brick arch tunnels, long and damp crawlspaces, even gargantuan tunnels within tunnels, all of which go nowhere

and serve no purpose. This process of tunnel construction would continue right up until Williamson's death in 1840^[1].

I myself have been lucky enough to visit the excavated remnants of Williamson's tunnels, and while just a tiny portion of the tunnels have been uncovered, the scale and intricacy of the project is astounding. However, one must inevitably ask the obvious question of why it was built at all.

There have been many proposals as to Williamson's motivation behind this seeming testament to pointlessness; from building bunkers to protect his associates from the end of the world, to a frantic search for buried treasure of some form. The only certainty is that we will never know the full truth, as the man was rather secretive regarding his reasons. However the generally accepted view is the one gleaned from Williamson's own opinion of his workers, about whom he said: "*all received a weekly wage and were thus enabled to enjoy the blessing of charity without the attendant curse of stifled self respect.*" Quite simply, Williamson wanted to employ the unemployed^[1].

Gazing at the hand crafted brickwork, precisely positioned by a skilled artisan over 200 years ago and still intact today; I was astonished at how such highly sought talents and enthusiasm for work could have been unnoticed by the labour market of the 1800s. If these extraordinary tunnels could be constructed by an army of unemployed, simply working for the sake of working, imagine what excess capacity was constantly going to waste. Imagine if this excess capacity could be oriented into something constructive rather than the folly of an eccentric businessman.

The true profundity of this undertaking however lies outside Williamson's winding labyrinth, in the effect which his tremendous folly had on the local economy. Upon the end of the Napoleonic Wars in 1816, the factories and ports began to wind down from the overexertion of war, and as the soldiers came home, workers soon far outnumbered the positions available - recession set in. It was through Williamson's folly that the strife of the unemployed hoards was mitigated, providing valuable wages and apprenticeships to young workers, many of which went on to find work elsewhere, such as in the developing railway industry from 1830 onwards^[1].

Obscure history lessons aside, our modern economy has much to learn from the unusual antics of Liverpool's eccentric philanthropist. The entire episode underlines the chronic importance of waged employment in our social system, and how highly valued even the most demonstrably pointless tasks are. Granted,

our society has not resorted to building tunnels that go nowhere just yet, but in many respects, a considerable proportion of people are still 'working for Williamson' so to speak.

In financial dire straits, few of us would actively turn down a job regardless of its relevance or purpose to society. In fact, I'm sure sufficient numbers of underemployed would be thrilled to work on an eccentric businessman's ludicrous folly even today.

In this chapter, we will discuss the centrality of employment to social wellbeing within the modern market economy, and compare this centrality to the broad trends in employment over time. As we will see, the market's unwavering and indiscriminate emphasis on waged employment is ultimately self defeating, when offset against the inherent capitalist prerogative of increasing cost efficiency.

The Trend Towards Efficiency

Of all its facets, capitalism's impetus towards efficiency is perhaps the one which is most widely lauded within the economic literature. Markets ensure that businesses constantly adapt, improve and strive toward the most cost effective solution possible, as this is likely the solution which will deliver the most profit for shareholders. Improvement in efficiency also allows products and services to be sold to the consumer at a lesser cost, undercutting competition and safeguarding market share. The result is supposedly a society where social benefit is delivered at maximum efficiency, while inefficient or ineffective businesses are routed from the market by more shrewd competitors.

The quandary arises when this trend of efficiency manifests in tools, approaches and technologies which act to reduce the number of employees required to produce the goods in question. The payment of wages to employees is a significant overhead for business, and therefore the rationale in streamlining the wage bill where possible is understandable to any employer.

However, when the number of employees required to produce society's goods and services reduces, the aggregate purchasing power of the population too reduces. With wages and consumption essentially forming a zero sum game, efficient systems of production result in a scenario where - on average - consumers cannot afford to purchase what businesses produce, because they are

collectively no longer employed at a sufficient rate^{*}. This general trend is fairly well documented, and is typically referred to as 'the contradiction of capitalism', or, less politically, 'technological unemployment'.

The reader is forgiven at this point if they have never heard of the term 'technological unemployment'. While the general concept of this variety of unemployment has been discussed extensively in literature, and in historical public discourse, latter-day politics has little to say on the matter.

Ever since the late 18th century when Ned Ludd struck out at the frantic pace of technological development by smashing the weaving looms which had cost so many their jobs, the belief that machines would replace people in the workplace has been dismissed as the so called 'Luddite Fallacy'^[2]. But were the Luddites so wrong in their concern regarding technology stealing jobs, or were they just jumping the gun a bit?

As always, the truth lies in the data: For example, Figure 1.5-1 shows the decline in U.S. manufacturing jobs across the last 20 years; it has nearly halved. Intuition would perhaps suggest that this data is associated with a historical decline in industry in prosperous Western nations. It is indeed a common criticism of Western business that large scale manufacturing is disproportionately outsourced to cheaper foreign factories, rather than taking place domestically.

However, Figure 1.5-2 shows that this viewpoint does not explain the trends, as U.S. productivity is actually rising, as is output per employee (Figure 1.5-3), almost tripling within 40 years in fact. Similar manufacturing trends are notable in other developed Western countries, such as the UK, Japan and most of Western Europe^[4].

** This broad trend also feeds into society's propensity for growth. As we have seen in chapter 1.4, the economy must grow to outrun the debt raised against it. A similar scenario occurs here, as increased efficiency invariably means a reduction in workforce, assuming output remains constant. In order to outrun the falling numbers of employed and avoid collapse and depression, the economy has no choice but to raise output year on year, in order to create new employment to replace those jobs rendered obsolete. A more rigorous discussion of growth is included in chapter 1.13.*

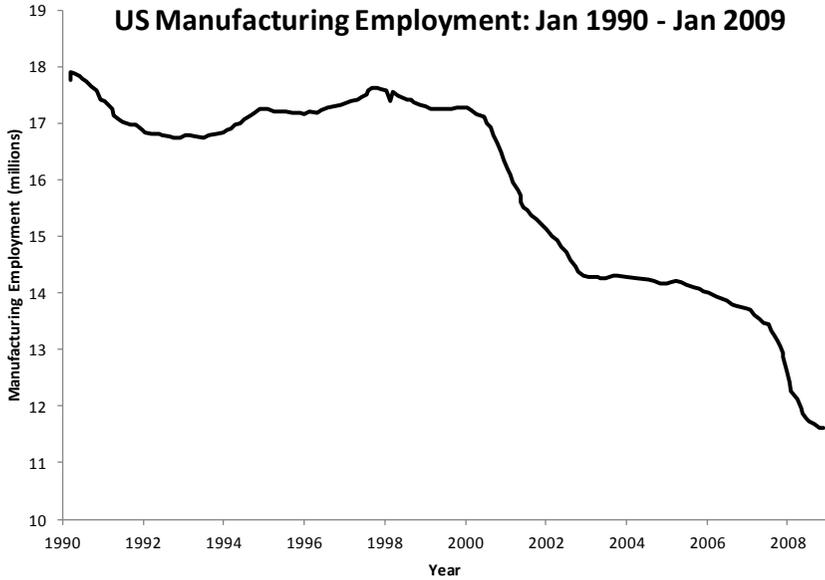


Figure 1.5-1 - U.S. Manufacturing Employment Trend between 1990 and 2009. Note that despite population and economic growth in the USA over this period, manufacturing employment still reduced in numerical terms. Data plotted by Author from [3]



Figure 1.5-2 - Plot of U.S. Industrial Productivity Index between 1990 and 2009 - A measure of how much the U.S. manufacturing sector produces year-on-year. Plotted by author from [5]

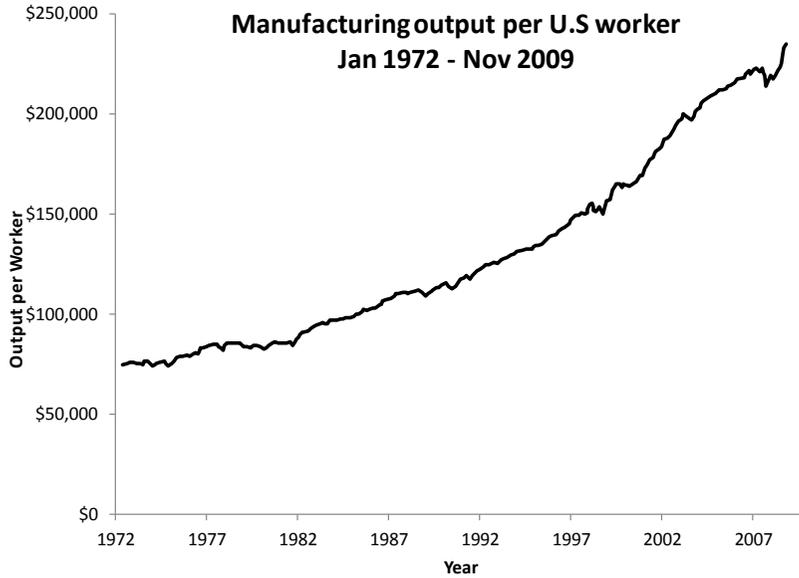


Figure 1.5-3 - Plot of raw economic output per worker (corrected for inflation and expressed in 2000 USD) - Plotted by Author from [6]

From the previous figures, we can see that U.S. manufacturing productivity is rising, yet the number of employees in manufacturing is falling. Perhaps then, these trends are due to manufacturing becoming an increasingly tiny proportion of the overall economic output. It seems intuitive that despite increasing productivity, the manufacturing sector might now represent a smaller piece of the overall economic pie, and as such require a smaller share of the population as employees. Figure 1.5-4 however also puts this hypothesis to rest, as the percent of GDP generated from manufacturing remains constant at about 14%, within a $\pm 1\%$ envelope of fluctuation.

Manufacturing is however not alone. Similar trends are also visible in agricultural jobs. The number of agricultural workers in the U.S. in 1870 was approximately 80 percent of the U.S. population. By 2008, just 2-3 percent worked in agriculture^[8]. This again could be attributed to the progression of globalisation allowing more food to be shipped in from abroad, but a closer analysis is needed to determine if this is indeed the cause. Figure 1.5-5 shows that while globalisation may be partly responsible, the amount of food being produced on American soil is still rising sharply, almost tripling.

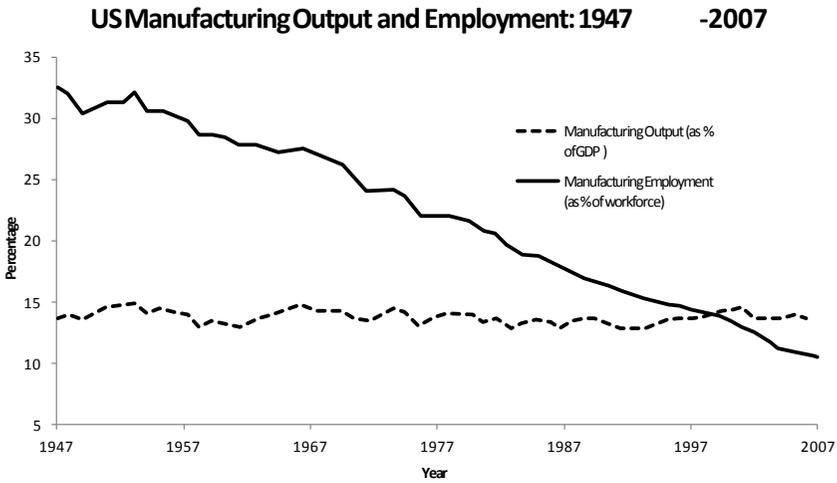


Figure 1.5-4 - Plot showing the percentage of the U.S. workforce employed in manufacturing, compared to the percent of U.S. national GDP generated by the manufacturing sector. Note that the GDP generated remains constant, while the employment rate consistently declines. Plotted by Author from [7]

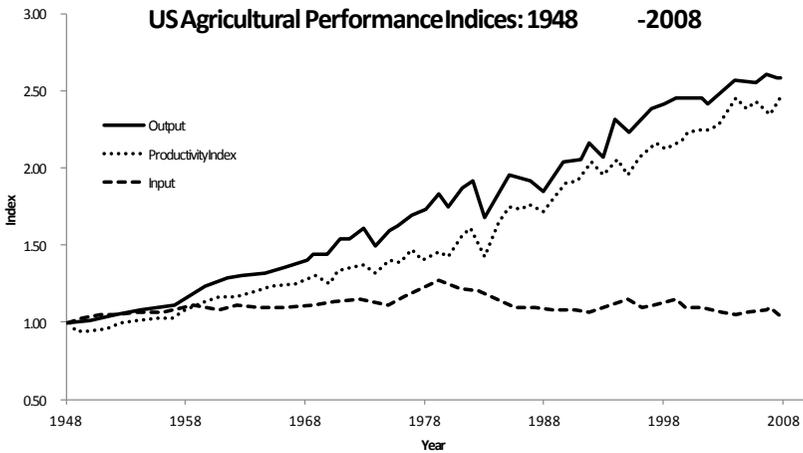


Figure 1.5-5 - Plot showing indices representing agricultural Output (raw amount of food produced), Productivity (food produced per worker) and Input (raw amount of food imported) for the USA between 1948 and 2008. Adapted by author from [9]

Could it be that the Luddites were actually correct, and our increasing technology is the reason behind this? It is obvious even to the lay person that the face of manufacturing and agriculture over the past fifty years has changed dramatically, yet the subsequent effect on employment is seldom considered.

Near fully automated assembly plants are now commonplace for cars, general appliances, toys etc. with a fraction of the workers needed to oversee their operation. Agriculture has undergone a similar facelift. There is little that a farmer on a moderately sized farm cannot do alone with modern combine harvesting and heavy tractor equipment.

A Consumption Viewpoint

Most however will dismiss increased efficiency in these fields of work as a good thing. Doing more with less is always an ideal which is admirable to strive towards, so where is the problem? While we have précised a definition of technological employment within the opening section of the chapter, the complexity and counter-intuition of this phenomenon warrants an expansion of this explanation.

In order to properly expand upon this, we must speak in terms of the consumption cycle as defined in chapter 1.2. As we have already discussed, the free market system requires high employment rates in order for people to be able to buy the goods and services that are supplied. This is the basic impulse which keeps the consumption cycle going.

From a business point of view, employment is little more than an overhead that is incurred in the process of bringing a product or service to market. Hence the workforce is designed and selected to be as minimal and efficient as possible in order to yield the greatest turnover. This inevitably leads to elimination of non-essential staff in order to thin out the overheads. Fewer employees means a leaner, healthier business.

However this makes the gross assumption that the customer and the employee are distinct and separate entities sourced from different pools. In actuality, as the consumption cycle analysis in chapter 1.2 shows us, the consumers and the employees are the same people. By progressively increasing efficiency across the board, and hence reducing the number of people in the employ of a company, the natural incentives to reduce labour overheads inadvertently reduces the total amount of discretionary income of the consumer pool (remember, the customer is also the employee).

In isolation, this may seem a negligible and benign effect, but it must also be considered that in order to remain competitive, all companies must follow these prerogatives or risk being undercut in the market. This leaves the market in a situation where incentivised, holistic increases in efficiency across the board allow short term boosts to the bottom line, but ultimately undermine the health

of the market in the long term by incrementally reducing the potential customer base.

Hidden in Plain Sight

Erik Brynjolfsson, leading economist and director of the M.I.T. Center for Digital Business, and Andrew P. McAfee, associate director and principal research scientist at the centre, have written extensively about technological unemployment in their wittily titled book, *Race Against the Machine*. What is of particular interest is that originally the pair had set out to write a book espousing the benefits of accelerating technologies, however the employment trends which they unearthed in their research of the U.S. labour market made a sobering about-face necessary^[10].

What Brynjolfsson and McAfee found in the USA is far from an anomaly, as this problem is also a global issue. It has been conclusively shown that productivity gains spawned by factory automation are driving a worldwide decline in manufacturing jobs, even in developing nations^[11].

So why haven't we seen the effects of this so far? Why has the economy not already collapsed under this continuing threat to its integrity? In his book, *The Lights in the Tunnel*, Martin Ford postulates that while agriculture, manufacturing and hard labour jobs have been in decline for decades, the tertiary service sector has absorbed this employment, masking the nature of the problem^[12].

Figure 1.5-6 shows the swelling of the U.S service sector in size over the past 50 years. The sector has more than quadrupled in workforce numbers. Similar trends are seen in government, education, healthcare, and financial services. When compared with the decline in manufacturing (Figure 1.5-4) it is unsurprising that technological employment goes unnoticed by the mainstream media. Whenever a labour job is lost, a service job seems to appear and snap the worker up.

So everything is ok, then; the service sector will act as a sponge to soak up the displaced workers from the heavy labour jobs, and the net purchasing ability of the employee/consumer base is retained, right? Not quite. This assumption only holds if the service sector is entirely resistant to technological streamlining, and is able to further swell to accommodate other increasingly automated sectors. Is this a valid assumption that we can make?

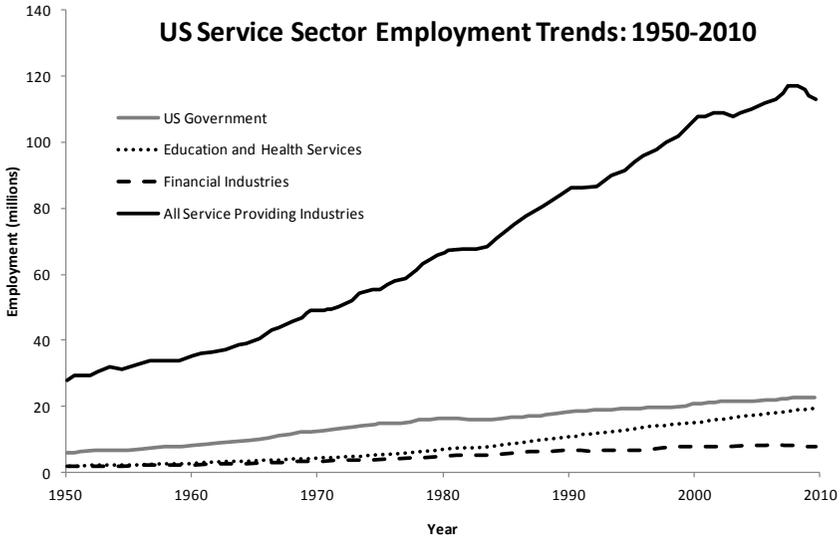


Figure 1.5-6 - Plot showing employment numbers in government, education and health, financial and all other service professions. Plotted by author using data from [13]

In short, no. To assume the service sector will not lose out to automation is untrue, and this can be seen just by looking at the world we live in, and how much service sector employment is already eroding.

In order to clarify this progression, a typical example routine can be perused in two different time settings to see how many wage earning service sector humans a typical customer interacts with. Think of your own if you wish, but the example provided here will be a simple trip to the local shops.

Fifty years ago, if you wanted to go shopping you would hop into your car, maybe dropping by the petrol station to get the pump attendant to fill it up. Upon arrival in town, you would pay the car park attendant, who would issue you a ticket to allow entry. You would then probably need some money from the bank, so you would go into the bank and ask the cashier to withdraw some money from your account. With cash in hand you would stroll into the general store and pick up what you needed, paying the service assistant with the money that you withdrew from the bank. Thrilled by your exciting adventure, you would get back into the car and go home again.

Now let us examine this mundane, everyday task if it were to happen today. You would get into your car and drive to the petrol station, where you would fill up the car yourself and pay by chip and pin card at the pump. Upon arrival in town

you would locate the nearest car park, which would print you a ticket automatically upon entry to pay for when you leave. Once in town, you would need some money, so you would find the nearest ATM machine and withdraw the money needed. You would enter the supermarket and grab the shopping required, paying using a self service checkout. As thrilled as your 1950's counterpart with your groceries, you would get back into the car and return home.

Two identical situations, just 50 years apart, yet they couldn't be more different. The modern day shopper manages to get through the entire scenario without actually meeting a human worker. The example however is at an exaggerated complexity even in this form, as it is possible now to just buy your food on the internet and have it driven straight to you. Think of all those jobs that this circumvents and forces into obsolescence. The checkout attendants, the pump attendant, the car park ticket inspector, the bank clerk, all bypassed instantly by a few clicks of a mouse. Is it still wise to assume that the service sector is immune to technological unemployment?

Automation is Not Localised

Hypothetical thought experiments aside, the effect of automation on our service sector is not one that can be taken lightly. As this book is being written, the FuA-Men restaurant in Japan is using fully automated kitchens to prepare ramen dishes^[14], while Baggers fast food in Germany is eliminating the need for waiters by automating kitchen to table delivery^[15].

The restaurant sector is not alone in this progression; the J. Sainsbury supermarket chain in the UK is installing automated pharmacies to issue drugs based on prescriptions^[16]. Morrision Hospital in Swansea, Forth Valley Royal hospital in Larbert, West Suffolk Hospital in Bury St Edmunds and Pritchard Pharmacy in Prestatyn are also following their example. Forth Valley has also invested heavily in robotic porters to ferry various items around the hospital automatically^[17]; Fiona Stanley hospital in Australia is also set to do the same^[18].

In the classroom, children in the South Korean cities of Masan and Daegu are being taught by robotic English tutors developed by the Korean Institute of Science and Technology (KIST). This however is not a one off quirk, the Korean Education Ministry projects that all kindergartens in the nation will have robotic instructors in the classroom by 2013^[19].

Additionally, since the global recession, EMN8, a San Diego based company that produces self-service kiosks to restaurants, has seen a "dramatic increase" in interest from vendors said Brent Christensen, vice president of sales at EMN8. The company claims that these machines can save restaurants 60% in labour costs alone^[20].

These examples are just scratching the surface of the developments being made today and the falling costs of robotics and computing equipment will only make it more commonplace. It seems that no area of the service sector is safe from rampant and ever progressing technological advancement. Likewise, the military and police forces around the world are also heavily investing in unmanned technology which will further remove jobs from the labour market.

The Luddite Fallacy however acknowledges this to an extent, but argues that while automation is a threat to jobs today, it will not continue to such a point that little or no jobs will remain. This is believed for two primary reasons;

1. *New technology creates new jobs and markets which absorb the jobs phased out by technology.*
2. *The vast majority of jobs are difficult or impossible to automate.*

While seemingly being logical conclusions to draw, they are rooted in assumptions which must be validated. This will be the topic of the following two subsections

Assumption One - New Technology Creates New Markets and Jobs

Analysing this assumption, we may hypothesize that as the service sector emerged to absorb displaced manufacturing workers, new technology based sectors will develop in the future to accommodate further job obsolescence. This assumption is however debunked most aptly by Ford in *The Lights in the Tunnel*:

“Suppose you found a new technology start-up company in Silicon Valley. You obtain funding, and your company starts to grow. Who do you hire? Engineers, people to work in accounting, human resources, marketing and finance; administrative assistants and people to work in shipping and receiving: these are all traditional jobs. The people working at Google do not all have weird new-age jobs; by and large, they have the same types of jobs as people working at General Motors.”^[21]

Further weight is added to this argument when you examine not only the nature of employment within breakthrough technology companies, but also the scale of employment. Table 1.5-1 also shows how typical technology companies represent a disproportionately large slice of GDP in relation to their small employee counts.

Company	Employees	Revenue per Employee
McDonalds	400,000	\$59,000
Wal-Mart	2,100,000	\$180,000
Intel	83,000	\$456,000
Microsoft	91,000	\$664,000
Google	20,000	\$1,081,000

Table 1.5-1: Selection of tech and traditional firms and their 2008 employee-to-revenue performance. Note that the high-tech companies here are drastically smaller in scale to the more traditional firms, despite generating large revenues. Adapted by author from [22]

While this is intrinsically good for a country’s GDP, it does not back up the assumption that new technology generates jobs to replace those that have been automated. If anything, this demonstrates that technology based enterprises are incredibly streamlined, and have a decidedly lacklustre contribution to the labour market.

Consider a typical great success story of our modern age, the rise of YouTube, which was acquired by Google in 2006 for \$1.65 billion. At the time of the buyout, YouTube had around sixty employees. That’s an employee value of over \$27 million per head, which is startling when compared to the data in Table 1.5-1^[23].

But this trend is also true even in the more established 'modern' sectors of tech employment, such as computing or IT. Table 1.5-2 shows all the sectors in the U.S. employment market which employ more than one million total workers. All in all, the list comprises just shy of 40% of the jobs in the United States, and yet none of these represent new or technology dependent industries. If anything, these major employers exclusively constitute older and more labour intensive roles that have existed for decades.

Occupation	Number of Workers	Percentage
Salespeople	4374230	3.3%
Cashiers	3479390	2.6%
Office Clerks	3026710	2.3%
Food Preparation and Serving	2461890	1.9%
Registered Nurses	2417150	1.8%
Labourers and material movers	2372130	1.8%
Waiters	2312930	1.7%
Customer Service	2147770	1.6%
Janitors and Cleaners	2124860	1.6%
Bookkeeping and Accounting	1856890	1.4%
Secretaries (except legal/medical/executive)	1750600	1.3%
Stock clerks	1705450	1.3%
Truck and Tractor drivers	1673950	1.3%
General and Operations Managers	1663280	1.3%
Elementary School Teachers	1509180	1.1%
Sales representatives (except scientific and technical products)	1488990	1.1%
Executive Secretaries	1487310	1.1%
Nursing Aides, orderlies and attendants	1376660	1.0%
First Line managers of office and administrative workers	1351180	1.0%
Maintenance and repair workers	1310580	1.0%
Team assemblers	1250120	0.9%
Teaching assistants	1246030	0.9%
Receptionists and information clerks	1112350	0.8%
First Line managers of retail sales workers	1111740	0.8%
Accountants and auditors	1092960	0.8%
Secondary school teachers	1030780	0.8%
Construction Labourers	1016530	0.8%
Security Guards	1004130	0.8%
<i>Totals of above</i>	<i>50755770</i>	<i>38.3%</i>
<i>All other Occupations</i>	<i>81849210</i>	<i>61.7%</i>

Table 1.5-2: List of all types of occupation in the USA which account for more than one million employees. Note that most, if not all of these jobs are older, non-technological types of employment. Adapted by author from [24]

Furthermore, the advent of new technologies has an additional implication. Much has been written of the open source movement, but very little has been discussed about how this augurs for employment. Of all open source projects, the Linux kernel is perhaps the most famous and widely used. Linux is managed and standardised by the Linux foundation, but has been and continues to be developed by a band of hobbyist collaborators.

While it is certainly wondrous that the digital age has allowed such an audacious scale of public, non-profit collaboration, the effect of such trends on employment are almost overwhelmingly negative. Take for example the lauded Encyclopaedia Britannica, which up until 2010 had released print editions of its encyclopaedia for over 200 years.

The now online-only Britannica is compiled by a team of over 4000 professional scholars and editors, but despite this, it now holds a market share of less than 1% of all online encyclopaedias. Why is it the case that what was once the most renowned encyclopaedia on the planet is now floundering on the brink of financial viability? The answer is the 97% market share that is now enjoyed by the wholly voluntary Wikipedia^[25].

Elsewhere, open source is also gradually encroaching upon fields that have hitherto been the reserve of waged labour. The 3D printing revolution is only just beginning, as small, portable printers are starting to be marketed to households. While these are little more than conversation pieces or novelty gadgets today, their potential to disrupt large scale industry is astounding, as the technology becomes more refined.

Imagine a modern country where households can manufacture and assemble their own low cost furniture, based upon designs that can be downloaded from the internet. This represents a serious threat to established manufacturing, and stands as a clear demonstration that technology can destroy existing business models without necessarily creating any additional employment to replace them. This assumption therefore seems to be unjustifiable based upon the available data.

Assumption Two - The Majority of Specialist Jobs are Impossible to Automate

With the first assumption on thin ice, our attention can shift to the second assumption upon which the Luddite Fallacy is based. This statement is based upon the belief that computer development cannot become more effective than a human worker, and broadly comprises two arguments:

A. The majority of human jobs are incompatible with automation,

And, or;

B. Technology will never develop to the level where it can be applied to the majority of jobs.

Looking at point A, we seem to have a reasonable assumption here, as computation and robotics are still fairly poor at mimicking even the most rudimentary of human thought processes and movements. However, as a human, in what capacity do you stretch yourself in order to work? Does your work actively tax everything that makes you human, or does it target very specific skills or techniques?

Generally the answer here is that typical work does not require our all; we are not taxed to the full extent of our humanity by the vast majority of jobs. Jobs which we do typically fall into three loose categories which tax very precise and distinct aspects of our biology:

- *Category 1. Physical or Mechanical Based*
- *Category 2. Knowledge Based*
- *Category 3. Creativity Based*

Let's look at some examples of each.

A typical warehouse, service sector, farmer or industrial worker represents a typical category 1, physical or mechanical based job. Tasks involve physical motion with rudimentary environmental awareness and organisation. We already know that these tasks are easily and effectively carried out by machines, because they are being carried out by machines as we speak. Heavily automated warehouses, assembly lines and factories are already commonplace in our industrial sector, and automation in service and agriculture is progressing at an impressive rate as already covered.

The second subcategory here is employment which is based upon knowledge. This would typically encompass most professions where workers are required to know things and apply them, such as medical doctors, teachers, historians/archivists, etc. as well as many clerical roles based on standards and protocols such as HR.

Knowledge based employment is where it begins to get more interesting. In Ford's book, he presents the example case of radiology, a well paid and highly employable branch of medicine as an unlikely target for automation. You would assume that the highly paid and sought after skills of doctors would be the last thing in the world which machines would take over. However, analysing the average daily tasks of a radiotherapist, it was found by Ford that the job mainly consisted of very basic image analysis and recognition. This was made more simplistic by the fact that the images from the various scans are all uniform, i.e. from the same angle, with the same resolution, similar dimensions etc. ^[26]

This is a task which is more suited to a piece of highly advanced image processing software than a human being. In fact, given the incentive to reduce costs and liability which is so prevalent in medicine, does it not seem sensible to delegate these simple seek-and-identify tasks to a highly efficient, unbiased and accurate software program? Indeed, these kinds of radiology jobs are already

subject to cost driven outsourcing to India simply because the Indian doctors are willing to work for 10% of the wage of a Western doctor^[26].

Branches of medicine are not alone in high paid professions which are wide open to encroachment by automation. In fact, a large proportion of knowledge based jobs can be significantly reduced in number by today's advanced software technology, never mind tomorrow's. Out of courtroom lawyers who peruse legal databases are also already being outsourced, it is only the next logical step to automate these tasks with tools similar to 'smart' search engine algorithms. Similar interpretative, empirical and logic based areas of work such as human resources, recruitment, management, diagnostics, teaching and cataloguing are all susceptible to streamlining and running with significantly reduced staff in the wake of advancing technology^[27].

Creativity based work is the third category, and is one that is based primarily on problem solving. An important thing to note here is that creativity workers represent an insignificant proportion of the labour market, if looking strictly by percentages. However, creativity is home to a wide variety of job descriptions.

Everything from artists and musicians, to mathematicians and scientists come under the field of creative based work. This field of work is based on abstract empirical and subjective reasoning alike, ranging from cutting edge research, development and analysis to emotion driven composition and expression. This is the small field of work which a machine cannot really intrude upon, right?

Creativity is something that machines are generally very bad at. It involves thinking in abstract patterns rather than mechanistic, logic based reasoning. Creativity as such is something which is very difficult to replicate, or indeed even quantify. However, machines do not need to be creative in order to solve incredibly complicated problems. Ford attributes this to the so called, brute force factor^[28], which computers are very good at applying. The prime example of brute force vs. creativity is chess master Garry Kasparov's defeat at the hands of the IBM supercomputer, Deep Blue in 1997.

No one would claim that the computer here is more creative with its strategy than the human, but instead its advantage lies in the fact that it can evaluate millions of move combinations a second to eliminate the incorrect or suboptimal ones. The human must logically reason and be creative in deciding which moves to consider in the first place, simply because considering them all is impossibly long-winded for the human mind. The machine however is not limited in this regard.

Is it thus unwise to assume that empirical analysis which requires creativity can be enhanced by, or streamlined in some way by software? It seems that as technology accelerates, creativity can be to some extent beaten down by the brute force of computational power. Indeed, at Aberystwyth University, researchers have gone a step further than this with Adam the robotic scientist. Adam made waves in 2009 when he (it?) became the first fully automated machine to create a scientific hypothesis, test that hypothesis and then determine it to be valid. This is what most laypeople would constitute a 'discovery', and it was carried out by nothing more than an algorithm^[29].

While automation of creativity and knowledge based employment may seem farfetched to most readers, it must be emphasised that technological unemployment is not about sci-fi style humanoid robots walking around offices doing our jobs. It is a much more subtle progression and one that largely occurs through incremental progression.

For example, the majority of creativity and knowledge based workers take for granted how they use specialist tools and computer packages to organise information and help make work easier. Engineers, scientists, mathematicians and designers from all fields use countless CAD/CAM packages, modelling software, analytical tools, programming languages, spreadsheets, databases and a plethora of other methods in day to day work.

Think of all the jobs which were once dependent on producing the detail drawings that one person can now do with a CAD package in less than a day. Think of how many hundreds of offices of number crunchers that all advanced analysis software has made obsolete. Even the average cheap scientific calculator can do calculations nearly instantly that once took a room full of mathematicians all day.

This trend is also exacerbated not only by the technology we use to help, but also the technology we produce and sell. The digital age has brought about a revolution in media which can be reproduced and transmitted with no physical form. Digital music and streaming services are arguably the dominant music platform, while eBook formats are gathering steam as a viable alternative to printed text. As elsewhere, jobs that exist in plants which produce Compact Discs or print books and magazines are facing a difficult future, as newer and far less intensive means of entertainment are taking hold. These forms of media do not need factories, factory managers, administrative departments, etc.

Glancing back to our first statement, is it really unreasonable to assume that the majority of jobs in fact are vulnerable to streamlining in some way by automation in the foreseeable future? The only jobs which have escaped completely unscathed from this analysis are art based creativity jobs, and to a lesser extent trade jobs, such as plumbers and mechanics, which combine complex aspects of knowledge with physical work.

Bear in mind that for the global economy to begin an unemployment driven decline, it does not require that absolutely all of these mentioned fields of work are affected. It is almost unimaginable for the consumption driven global economy to continue running if developed country unemployment approached 50%, never mind the worst case scenario which is painted here.

But a 50% unemployment rate as a line in the sand may not even be that far away. A paper compiled by Carl Benedikt Frey and Michael A. Osborne in September 2013 suggested that within just two decades, 47% of all American jobs could be automated^[30]. A map of automation probability for the American economy is taken from the paper and shown below in Figure 1.5-7.

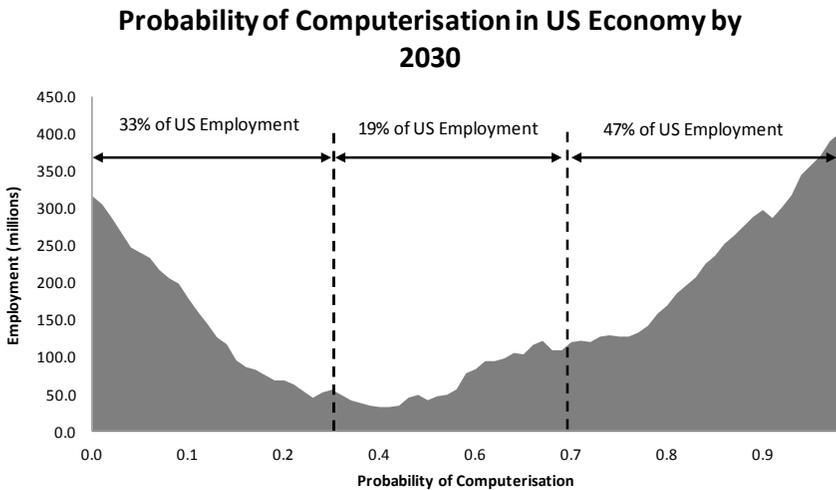


Figure 1.5-7: Graph showing probability of computerisation across U.S. job market by 2030. Job types with 70% to 100% likelihood of streamlining by computerisation comprised 47% of the total jobs in the country. Simplified by author from [30], pg 37

The graphic shows the sheer volume of jobs which are imminently at risk of automation or computerisation, but perhaps is also telling in how so many of these jobs are also encroaching into sectors which are considered to require creativity.

The paper details that, as expected, the bulk of high probability jobs are physical activities such as production, transport, etc. but there is a non-negligible minority of jobs at moderate risk within healthcare, engineering, management and even fine arts and media^[30]. The argument that creative jobs are largely immune to automation may be even less robust than we assume when the trend is actually perused.

It should also be considered that this trend is unstable, as the nature of the so called "financial climate" is likely to degrade with advancing technology based unemployment, which is in turn likely to prompt businesses to cut jobs further to stay competitive, leading to a worsening financial climate due to further reduced consumption capacity: A vicious downward spiral.

Due to the self interest nature of the market, it is also incredibly unlikely that the businesses which constitute the economy will see the root cause of the problem and re-hire employees, as this will leave a generous company in an uncompetitive position if action is taken unilaterally*. Furthermore, global businesses coming to consensus to re-hire en-masse is also chronically unlikely, as the global GDP would instantly plummet, which would not be seen as a good business decision by governments or shareholders alike.

Therefore, with the first component of this assumption seemingly without basis, we may move onto the second component of the assumption; a statement which would very much anger futurists around the world:

B. *Technology will never develop to the level where it can be applied to the majority of jobs.*

Why is this so? Is it unwise to assume that soon we will hit a plateau in our development of technology?

The modelling of our technological progression over time is one that has been subject to much analysis since Gordon Moore studied the trends of the components in integrated circuits from 1958 to 1965^[31]. The discovery of this trend of CPU components became known as Moore's Law, and was predicted to continue for around 10 years from time of writing. Moore's Law, while not technically a law but an observation of a trend, is however still used today to model the progression of technology quantifiably with respect to time.

* *A classic prisoner's dilemma, as we will see in chapter 2.2*

But what does Moore’s law actually state? It is obvious that our technology is improving, but how quickly? A typical Moore’s Law plot is shown in Figure 1.5-8, plotting the number of transistors in a CPU against time.

Moore’s Law of CPU Transistor Growth: 1971-2003

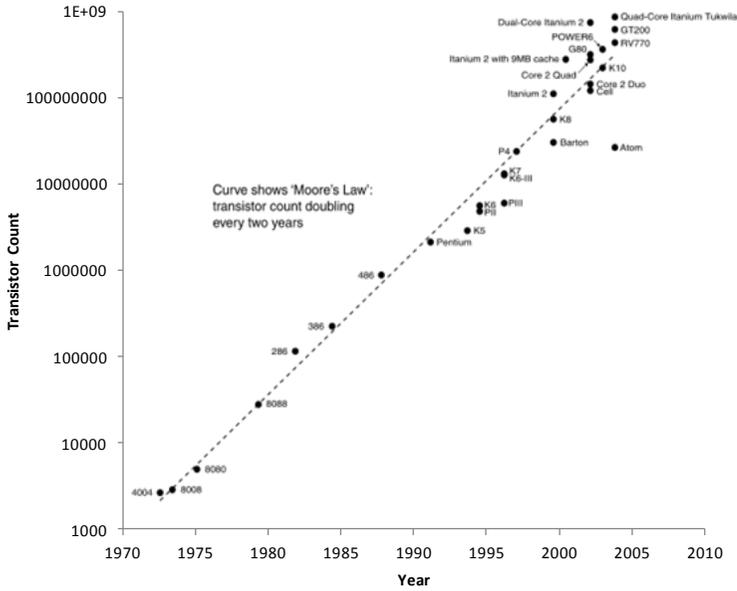


Figure 1.5-8 - Graph showing typical Moore’s Law plot. Over time, the number of transistors on integrated circuit boards increases. This increase is exponential (note that the vertical axis grows in orders of magnitude, not numerical increments) - Adapted by author from [32]

The relationship seems fairly straightforward at a glance. CPU Transistor count increases steadily with time, as we might suspect. However, it should be understood that the vertical axis in Figure 1.5-8 is logarithmic, meaning that for every unit increment upwards, the previous increment is multiplied by 10. If this were plotted with a conventional, linear scale, the graph would look more like Figure 1.5-9, an exponential function.

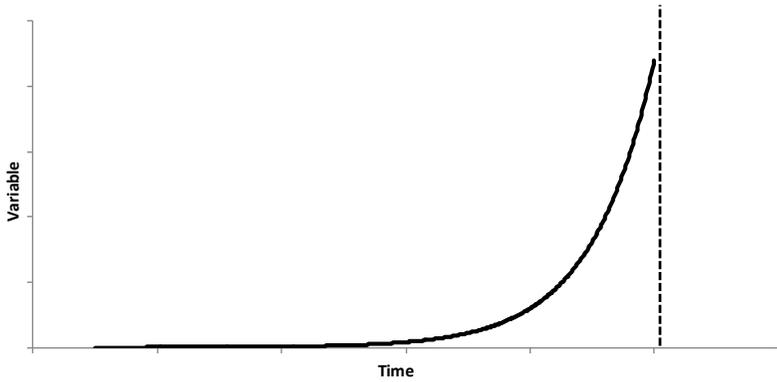


Figure 1.5-9 - An example of an exponential function. Note that as time increases, not only does the variable increase, but the rate at which the variable increases also increases. This continues until the trend is rising as a near-vertical line (an asymptote)

This trend is however not limited to just CPU components, Figure 1.5-10 shows the progression of available hard drive capacity, while Figure 1.5-11 shows the pixel counts on digital cameras. Both figures obeying the general pattern set out by Moore's Law.

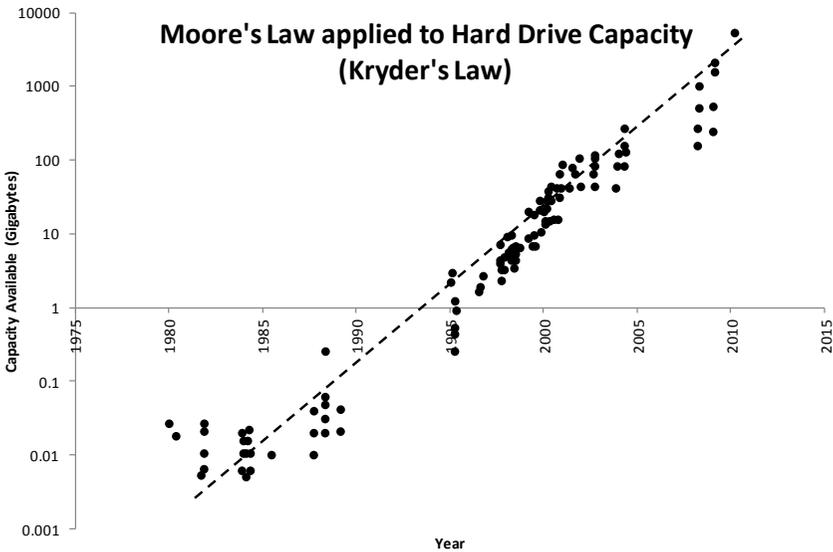


Figure 1.5-10 - Kryder's Law (Moore's Law when applied to hard disk drive capacity) - Adapted by author from [33]

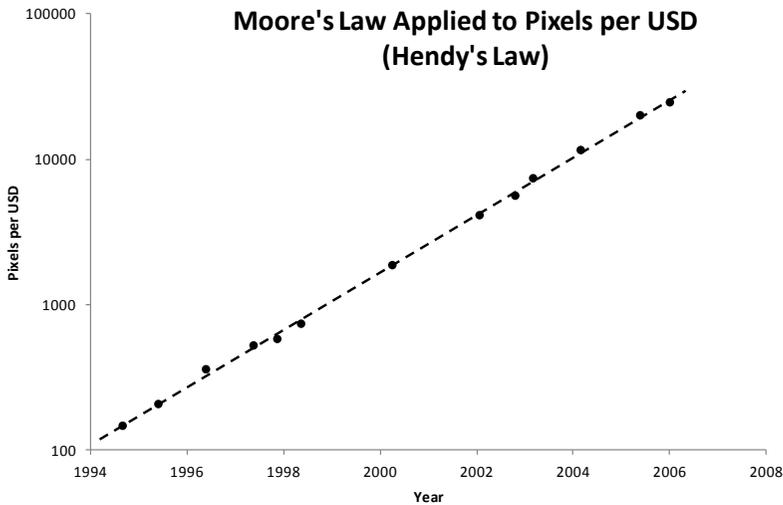


Figure 1.5-11 - Hendy's Law (Moore's Law when applied to the pixels available per USD in digital cameras) - Adapted by author from [34]

The primary reason why futurists become so excited by this law is because exponential functions at a certain value of x , or in this case, time, approach what is called an asymptote. This is a vertical line, which the exponential function will never reach, but will continue surging upward until it is indistinguishable from the vertical. An example of this is shown in Figure 1.5-9.

Futurists such as Ray Kurzweil are interested how the asymptote will manifest in this real life exponential relationship, as if Moore's Law continues to hold, the increase in processor power will accelerate unimaginably quickly when this asymptotic year is approached. This is what has become known as the 'technological singularity', and represents a point beyond which technology accelerates so quickly that prediction is impossible^[35].

In my opinion, I believe that a technological singularity will never occur. It is certain that we will continue to develop, but sooner or later the exponential law must begin to return to linearity, as with all natural laws. It is generally estimated that circa 2021, there simply won't be enough atoms left to shrink transistors down to, and Moore's Law will inevitably level out.

However it cannot be said that our computational ability stems solely from the raw number of transistors available. Probability processing, UEFI, affordable water cooled processing, low voltage processing, neural networks and cloud

computing are all additional possible options to further the performance of transistor based circuitry without further shrinkage.

Furthermore, Professor Stephen Chou of Princeton University believes that Moore's Law applied to instruction cycles per second, rather than transistors will continue to hold into the foreseeable future, due to breakthrough technologies such as imprint lithography, silicon nanowires, phase change memory, spintronics, optoelectronics, 3D chips and crossbar latches^[36]. While there may be no more room for the transistor to develop, there are certainly other breakthrough methods to further our computational power.

Indeed, looking at Ray Kurzweil's interpretation of Moore's Law (Figure 1.5-12), we can see that instruction cycles per second have continued to hold true to the law through various technological shifts to new platforms of processing. The law has held strong through the transitions between electro-mechanical, vacuum tubes, transistors and microprocessor technology.

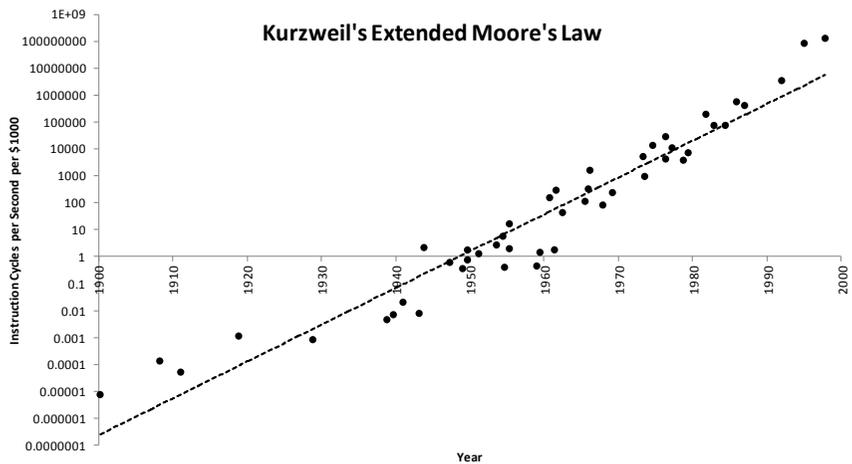


Figure 1.5-12 - Kurzweil's Extended Moore's Law (The Fifth Paradigm) - Plotting instruction cycles per second against time for a range of computation technologies. Adapted by author from [37]

What can be deduced from all this? Well at the very least, computational ability is likely to continue to progress according to an exponential function for another decade or so, until we reach the plateau of what can be done with integrated transistor based circuitry. It is unwise for us to assume that no technology will emerge beyond this kind of circuitry to continue progress, after all Moore's Law has been predicted to be ten years from its end for over three decades^[31], and

Figure 1.5-12 shows that its general trend has held through numerous changes of computation medium.

Coming back to the reason behind this analysis, is it still safe for us to assume that a machine's ability is never going to catch up to a human's ability at a specific task? The most conservative judgement concluded upon here is that Moore's Law is likely to hold for at least a decade or so. After this time period, progress may be more difficult and thus gradual, but there *still* will be progress to some degree. Computational power will still be improving, just not exponentially.

As such, the second assumption of the Luddite fallacy cannot be fully supported with evidence. As shown, the majority of jobs in our society are applicable to at least subtle streamlining by technology, while technology's capacity to process information itself is accelerating exponentially, and will continue to do so until at the very least 2021.

The Effect of Technological Unemployment

So we have established that the threat of technological unemployment is real and growing, but what needs to be addressed is the effect that this will have on society. Past governments as recently as the post World War Two era were far more literate and well versed in these issues than we are today, taking the Roosevelt administration in the USA as an example:

"During the depression, there was a struggle within the Roosevelt Administration over whether to fight unemployment by reducing work hours or promoting growth. Initially, Roosevelt supported the Black-Connery bill, which would have reduced the work-week to 30 hours. Virtually everyone believed that this bill was just a first step, that work hours would inevitably become even shorter in the future as technology continued to become more efficient."^[38]

Today, governments seem less savvy with these issues. Legislation to take advantage of technological efficiency (like the above Black-Connery Bill) has been piecemeal, temporary and inconsistent. Indeed, as we have seen in chapter 1.3, after a century long trend of falling working hours, the reduction has bottomed out, despite the tremendous leap forward in productivity.

So why is this? Why do modern governments seem to understand the interdependence of technology and labour less than their predecessors? Firstly, we must give credence for the fact that in the developed world we see the

magnitude of the problem hiding behind other employment trends, most notably offshoring and outsourcing to cheaper labour markets in the developing world.

Secondly, modern attempts to reduce working hours often come under heavy criticism from those who view the change as 'populist'*. Furthermore, such legislation is almost always confined to the public or non-profit sectors. For-profit business remains very difficult to convince of the potential benefits to social wellbeing as a whole.

So what is the actual effect of continuing down this path? As mentioned, much of the technological trends in unemployment hide within the trends surrounding offshoring of jobs to developing countries. However, the fiscal incentives which drive the developing world are not alien to us, they are in fact identical.

As such, any business in the developing world with a modicum of economic common sense will seek to reduce overheads in order to maximise profit. This reduction of overheads will naturally lead the business to implementing technology which can streamline and gradually reduce the workforce. Indeed, in Africa, agricultural unemployment has followed a similar technological driven decline as its Western counterparts^[39].

It is probable that developed world unemployment will continue to hide even as it takes hold of larger economies. Production of items from large Western nations will become more focused on export, in order to capture markets with sufficient purchasing power. This will most likely be misconstrued as competition from overseas, and the economic "changing of the guard" as China and developing states such as India come to the global fore.

However, as we have seen, developing countries run on identical incentives and so are subject to a similar trend. As technology develops and job numbers fall, the home markets of these countries will see a reduction in purchasing power. Businesses will then be left trying to sell to new emerging markets until all markets on the planet are drawn into the large scale global economy. Naturally, these will face the same fate; reduced jobs, reduced home market consumption and a shift to exporting in order to stay afloat.

However, by this point a very large proportion of the economies on the planet will be running based on export to each other. If there are no viable markets left to export to, what happens then? No consumption means no jobs, no products,

* *This was the rejoinder to Sweden's proposal to implement a shorter work week, see [41]*

no services etc. which obviously leads to an unprecedented failure of the economic system.

Granted, this worst case scenario is probably a considerable distance into the future, and it is highly possible that some emergency measures will be implemented to mitigate its impact, however, is this scenario not one that threatens the future of our very civilisation? Is it not prudent to at least address this in some way through economic reform today, just in case?

Governments do not think so. As such, while developed nations lumber forth with vast swathes of their population being underutilised, the expectation remains upon the business community to solve the problem through the marketplace.

So the structural effects of high levels of unemployment are potentially disastrous, as we have seen, but even if such a economic collapse was not possible, the personal effects upon the unemployed are serious enough to demand a re-think. As we have seen in our assessment of the 'failed consumer', the mental ramifications of being an individual unable to spend money in a society that is predicated upon spending are unanimously negative. Furthermore, the physical health of the unemployed is also needlessly placed into jeopardy by a lack of purchasing power. Stories of £20 food budgets per month, people living entirely on toast or becoming malnourished due to the point of dizziness are common in post-recession Britain^[40].

I personally find that this level of disregard for citizens of developed nations is a damning rejoinder to anybody who would say the market is a beneficial mechanism for society, regardless of whether any disastrous technological unemployment epidemic threatened the future of the economy. Despite the spin and scapegoating of the unemployed that surrounds most discourse in the developed world, the vast majority of unemployed people want to work and have value to give to the economy.

To therefore condemn them in their millions to a substandard life, simply because the whim of the marketplace has selected a machine as a more efficient employee, is a social and moral disgrace that should be shouted from the rooftops.

Conclusions

Returning to our overarching question, can we make a clear statement as to whether the market economy is beneficial to humanity through the scope of unemployment and technology? I argue that we can make a coherent case against the system based upon the following logic:

The individualist prerogative of the market encourages efficiency in order to remain competitive. Technology is a great source of efficiency and therefore its uptake and development is also encouraged. Technology erodes the requirement of waged labour, which in turn erodes gross purchasing power for consumption. It therefore follows that the individualist prerogatives of the marketplace, directly and exclusively, result in the overall erosion of the system at a collective level.

Again, with reference to the forthcoming chapter 1.9, we are met with an ecologically banal crisis in which sensible and intuitive microeconomic behaviour aggregates to an absurd macroeconomic scenario; that is, there are not enough employed people to consume the massive amounts of products that we are able to produce with ease.

As with most individualist driven ecological systems, the problem ceases to be so critical when the motive is shifted to a more managed, macroscopic view. Contrary to current belief, unemployment is a good thing. It means that the same amount of work is being done by less people, which is a direct commentary on our efficiency. Seldom in any system is efficiency a negative attribute, however within the contradictory incentives of market economics this trend manifests as a collective irrationality.

As a thought experiment, remove the individualist component from the equation, and consider that all people are granted work (by Williamson, or whoever) according to their ability and the needs of the community. Now also consider that technology is used to the fullest extent in order to make this fully employed population as efficient as possible. Very quickly, the collective absurdity of the entanglement between waged labour and consumption becomes apparent.

I will therefore leave the reader to decide whether a system which is at odds with itself on a collective scale, and which visits great turmoil upon people due to this contradiction, is actually a viable, effective or beneficial system to maintain into our uncertain future.

Chapter 1.5 - References and Notes

- [1]. Gabriel Muies, *Joseph Williamson: The Mole of Edge Hill*, Countywise Ltd, 2013)
- [2]. Kevin Binfield, *Writings of the Luddites*, Johns Hopkins University Press; Reprint edition, 2015)
- [3]. Data taken from U.S. Bureau of Labor Statistics - <http://www.bls.gov/data/>
Graph also available at: Howard Richman, Raymond Richman, and Jesse Richman, *Jobs, Jobs, Jobs, The American Thinker*, January 15, 2010, http://www.americanthinker.com/articles/2010/01/jobs_jobs_jobs.html
- [4]. Oliver Joy, *WEF founder says technological revolution 'will destroy employment'*, CNN, <http://edition.cnn.com/2014/01/23/business/wef-founder-technology-jobs>
- [5]. Data obtained from Econo magic tool - <http://www.economagic.com/>
- [6]. Data taken from Board of Governors of the Federal Reserve System - Industrial Production and Capacity Utilization - G.17 - <http://www.federalreserve.gov/Releases/g17/>
Graph also available at: Mark J. Perry, *Manufacturing Employment Falls to Record Lows, But Productivity Soars to Record High Levels*, American Enterprise Institute, December 23, 2009 - <http://www.aei.org/publication/manufacturing-employment-falls-to-record-lows-but-productivity-soars-to-record-high-levels/>
- [7]. Data taken from: 1) U.S. Bureau of Labor Statistics - <http://www.bls.gov/data/> - 2) U.S. Department of Commerce, Bureau of Economic Analysis - <http://www.bea.gov/itable/index.cfm> and BLS - Graph also available at: Jim manzi, *Keeping America's Edge*, National Affairs, issue 2, Winter 2010 - <http://www.nationalaffairs.com/publications/detail/keeping-a-mericas-edge>
- [8]. Data taken from Bureau for Labor Statistics - <http://www.bls.gov/data/>
- [9]. United States Department of Agriculture, Economic Research Service, *Agricultural Productivity in the U.S., Findings, Documentation, and Methods* - http://www.ers.usda.gov/data-products/agricultural-productivity-in-the-us/findings_documentation_and-methods.aspx
- [10]. Erik Brynjolfsson, Andrew McAfee, *Race Against The Machine: How the Digital Revolution is Accelerating Innovation, Driving*

Productivity, and Irreversibly Transforming Employment and the Economy, Digital Frontier Press, 2011

- [11]. Wes Iversen, *Outsourcing not the Culprit in Manufacturing Job Loss*, AutomationWorld, December 9th, 2003. - <http://www.automationworld.com/webonly-320>
- [12]. Martin Ford, *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*, CreateSpace Independent Publishing Platform, 2009
- [13]. Data taken from Federal Reserve Bank of St. Louis - FRED - Economic Research - <https://research.stlouisfed.org/fred2/graph/>
- [14]. *Robot Chefs Run Restaurant in Japan*, Fox News, August 06, 2009 - <http://www.foxnews.com/story/2009/08/06/robot-chefs-run-restaurant-in-japan.html>
- [15]. Steve Rosenberg, *Fast food, German-style*, BBC News, 8 April 2008 - <http://news.bbc.co.uk/1/hi/world/europe/7335351.stm>
- [16]. Anna-Marie Lever, *Vending machines for prescription drugs on trial*, BBC News, 16 August 2010 - <http://www.bbc.co.uk/news/health-10951297>
- [17]. *Forth Valley Royal Hospital to use robot 'workers'*, BBC News, 18 June 2010, <http://www.bbc.co.uk/news/10344849>
- [18]. *Robot staff plan for Fiona Stanley hospital*, October 30, 2010, <http://www.news.com.au/national/robot-staff-plan-for-fiona-stanley-hospital/story-e6f1fkp9-1225945557099>
- [19]. Susannah Palk, *Robot teachers invade South Korean classrooms*, CNN, October 22, 2010, <http://edition.cnn.com/2010/TECH/innovation/10/22/south.korea.robot.teachers/>
- [20]. Alana Semuels, *Automation is increasingly reducing U.S. workforces*, Los Angeles Times, 04 October 2010, <http://articles.latimes.com/2010/oct/04/business/la-fi-no-help-wanted-20101004>
- [21]. Martin Ford, *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*, CreateSpace Independent Publishing Platform, 2009, pg 61
- [22]. *Ibid*, pg 133
- [23]. *Ibid*, pg 132
- [24]. *Ibid*, pp59-60
- [25]. Juan Carlos Perez, *Hitwise: Wikipedia Squashes Encyclopedia Rivals*, PC World, Jan 23, 2009, <http://www.pcworld.com/article/158263/article.html>

- [26]. Martin Ford, *The Lights in the Tunnel: Automation, Accelerating Technology and the Economy of the Future*, CreateSpace Independent Publishing Platform, 2009, pg 64
- [27]. *Ibid*, pp70-72
- [28]. *Ibid*, pg 70
- [29]. Lizzie Buchen, *Robot Makes Scientific Discovery All by Itself*, Wired, 4 Feb 2009, <http://www.wired.com/2009/04/robotscientist/>
- [30]. Carl Benedikt Frey, Michael A. Osborne, *The Future of Employment: How Susceptible Are Jobs To Computerisation?* Oxford University Engineering Sciences Department, September 17, 2013
- [31]. Gordon E. Moore, *Cramming more components onto integrated circuits*, 1965
- [32]. Graph available via WikiMedia Commons; <https://commons.wikimedia.org/wiki/User:Wgsimon>
- [33]. Graph courtesy of David Rosenthal - <http://blog.dshr.org/>
- [34]. Graph courtesy of Barry Hendy - Taken from presentation to the 17th Annual Photo Marketing Association Australia Convention
- [35]. Vernor Vinge, *Vernor Vinge on the Singularity*. San Diego State University, 1993
- [36]. *Will Nanotech Preserve Moore's Law?* Forbes/Wolfe Nanotech Report, September 2003, Vol.2 no. 9
- [37]. Ray Kurzweil, *The Singularity Is Near: When Humans Transcend Biology*, Viking 2005, pg67
- [38]. *Choice of Work Hours*, Preservation Institute White Paper, Berkeley, CA, 2002.
- [39]. Jeremy Rifkin, *The End of Work: The Decline of the Global Labor Force and the Dawn of the Post-Market Era*, Putnam Publishing Group 1995
- [40]. Amelia Gentleman, *Below the breadline on Liverpool's workless estates*, The Guardian, Sunday 15th January 2012 - <http://www.guardian.co.uk/society/2012/jan/15/below-breadline-liverpool-workless-estates>
- [41]. Adam Withnall, *Sweden to trial six-hour public sector workday*, The Independent, Wednesday 09 April 2014 - <http://www.independent.co.uk/news/world/europe/sweden-to-trial-six-hour-public-sector-workday-9248009.htm>

1.6 The Path Towards Oligopoly

SCORES OF MODERN SOCIAL COMMENTATORS, who are often pigeonholed into the 'conspiracy theorist' label, fall into the common trap of vilifying a secret, elite dynasty, which guides the progression of history through nefarious means. The names of these purported organisations may vary - the N.W.O, the Bildeberg Group, the illuminati - but their theorised functions remain identical; control.

It must however be understood why this scenario is believed to be true. Society is generally not introspective enough to analyse itself and the values it perpetuates, never mind hold them accountable for problems which it sees within. In practice, we see hatred directed against certain scapegoats for issues within society, be it religion, hoodlums, angry music, bloody video games, etc. While these sectors of society may be to blame in very isolated cases, targeting such narrow circumstances is generally a knee-jerk reaction, rather than a pragmatic assessment of the root cause.

It is no different with conspiracy. Conspiracy offers a simple answer, as it presents a known enemy who are distinct and disembodied from the otherwise noble population. The conspirators provide a face against which blame and hatred can be therapeutically concentrated. It is comparatively easy to complain about Big Brother watching on CCTV, or creeping corporate and governmental monopolisation, rather than question the very basic protocols of market economics. Conspiracy and corporate monopolisation is a symptom of our problem, it is not the cause of it.

To illustrate this, imagine if you will, that a large and secretive corpora-political group was indeed running the world from behind closed doors. What would happen if the constituents of this organisation simultaneously were arrested, killed, or through some other means lost all ability to affect influence? The situation is strictly hypothetical, but would this really solve the world's problems?

The grim truth of the matter is that as soon as one global financial dynasty collapses, there will be another scrambling over its corpse to assume its position at the top of the pyramid, just as there will be another to dethrone this successor when the time is right. The global elite are not at the top through conspiracy, they are there through tendency, because those are the values that market economics encourages. They are nothing special or shady, just people who play the game and play it well.

However, the problem of monopolisation and power consolidation is one that goes far beyond the realm of conspiracy theory. It is a real and worsening illness, which is gradually spreading throughout our global economy. This chapter will assess why this is the case.

A Profile of Oligopoly

Any business is subject to pressure to grow. This is brought about by phenomena that we will discuss in chapter 1.13. Growth is viewed as a primary indicator of economic health, but as we have seen in the previous chapter, it is also a survival prerogative in an economy leveraged against debt. The prerogative of business to grow ever larger and more profitable has led to a scenario where tremendous market dominance is wielded by a small number of businesses within the economy - an oligopoly.

In order to illustrate the profile of this oligopoly, an example has been prepared to graphically highlight how the corporate gene pool has converged over time. Figure 1.6-1 maps the progression of civil and military aircraft manufacturers in Europe from the invention of commercial aircraft technology just before World War I, up to the present day.

Boxes highlighted in grey indicate companies which went out of business, were merged into or taken over by other firms. Boxes in black indicate where company's assets were acquired either outside of Europe or by non-aeronautical companies, resulting in the disappearance of financial presence in the local industry gene pool.

Grey speckled boxes represent active subsidiaries of larger corporations which are still trading under their own name, despite their stock being entirely owned by single or multiple parent companies. Striped boxes indicate active corporations or mergers, while white boxes represent independent companies who still own a majority of their own stock. A line between two entities indicates a merger, buyout or seizure of assets following cessation of trading.

I must stress that Figure 1.6-1 does not take into account small-scale, specialised or supply chain companies. It is purely a visual aid to map the progression of large scale manufacturing in an industry from its birth to the modern day. The aircraft industry is a good example of this due to its relative youth. The progression is also a fairly simplified one, as numerous more complex, multinational mergers are difficult to illustrate effectively.

Despite the simplicity of the illustration, the trend is instantly obvious. As of 2010, the EU is dominated by just three major corporations capable of commercial and military aircraft manufacture: BAE Systems, EADS and Finmeccanica. The European Aeronautic Defence and Space Company (EADS) is the largest of these three entities, the culmination of a gradual merger of 67 companies over 100 years. Nearly two thirds of all production capable aerospace companies in the EU over the last century can trace their lineage into EADS.

Of the remaining large scale independent producers in the speckled boxes, ownership is also held to some extent by EADS, with a 20% stake in Saab, and 46% of Dassault Aviation. It must also be noted that Figure 1.6-1 only takes into account aeronautical companies to be acquired. In reality, these three corporations also have an extensive presence in telecommunications, electrical engineering and general manufacturing, with BAE also encompassing Vickers Shipbuilding and Marconi Electrical Systems, Finmeccanica owning SELEX Galileo, and EADS Cassidian accumulating systems engineering firms from all over the world.

Joint ventures and stakes in subsidiaries are also common between these giants, with NHIndustries (EADS/Finmeccanica), ATR (EADS/Finmeccanica), EuroFighter and MBDA (EADS/Finmeccanica/BAE) producing world leading helicopters, regional jets, fighter aircraft and missile defence systems. The result is a corporate gene pool which looks relatively healthy, as distinct and varied brand names hide the true stagnation of the industry.

In reality, the only truly independent major companies which still are able to produce are Luftschiffbau Zeppelin GmbH, which manufactures airships, as well as Pilatus, Britten-Norman and Moravan Otrokovice (now called Zlin) which manufacture light aircraft. German manufacturer Grob still also produces light aircraft and gliders from behind the guise of a secretive Munich based amalgam known as H3.

Europe is not alone in this progression either. In North America, things are in a very similar state, with Boeing, Textron and Bombardier dominating the commercial side of aircraft production, while Boeing, Lockheed Martin, United Technologies and Northrop Grumman making up the majority of military aviation.

Economists may argue that a process as complex as aircraft manufacture constitutes an industry where set up costs are prohibitively high, thus the tendency is towards what is known as a natural monopoly. I however argue that due to the inherent instability in the system of debt backed economics, given enough time all industries will tend towards this outcome. High start up costs do little other than to accelerate the progression. Indeed, statistics which we will peruse later in the chapter largely support this view.

In layman's terms, there is no such thing as an economically natural monopoly; oligopoly is simply a natural progression in a usury based monetary economy. Those industries which are labelled as 'natural' in their monopolistic profiles are simply the most obviously consolidated markets due to the scale of operation.

Indeed, the Ludwig von Mises Institute rejected the concept in an article entitled *The Myth of Natural Monopoly*. This analysis gives historical perspective that the economic concept of natural monopoly was developed *ex post* in order to rationalise the acquisition of large, single provider government contracts in utilities. In short, these large companies would acquire the contracts and then hire economists to develop theories as to why their particular form of monopoly was 'natural'^[1].

Analysis of other industries in other countries yields similar results. In the US, General Motors exists as a culmination of over 40 distinct automotive brands over the course of a century, while The Walt Disney Corporation holds ownership or majority over HBO, Buena Vista International, The History Channel, ABC studios, ESPN, Marvel, Touchstone Pictures and countless other assets. General Electric is perhaps one of the most shocking of these super-corporations, having sizable assets in everything from general household appliances, to entertainment (NBC and Universal), aircraft engines, financial services, healthcare and pharmaceuticals^[2].

Examining the histories of other large American corporate entities such as Apple, AT&T, Microsoft, WalMart or Ford Motors show similar progressive absorption and acquisition of assets in all industries, thinning out the corporate

gene pool and forging a path towards oligopoly, duopoly or chronically reduced market choice.

This lack of market choice is further demonstrated overleaf in Figure 1.6-2, which shows how a stunning variety of everyday home sundries (food, cosmetics, pet care, toiletries etc.) can all find their way back to just 10 gigantic corporations. Perusing through the brands can prove eye opening considering that most Western families will likely find that their entire day-to-day spending habits can be found through just these corporations.

In Japan, the situation is little different. Toyota holds interests in numerous biotech arms, robotics, Lexus luxury cars, as well as shares in Daihatsu, Fuji Heavy Industries, Subaru, Izuzu and Mitsubishi Aircraft. In addition, the Mitsubishi group owns Japan's largest oil company, Nippon Oil/ENEOS, its largest bank, The Bank of Tokyo, Mitsubishi Heavy Industries, which manufactures printers, tanks, aircraft engines, AC units, ships, buildings and just about everything else in between, as well as owning additional dedicated financial services, food, energy and pharmaceuticals arms^[4].

Indeed, all other developed countries also see similar trends pointing towards degradation in the market variety, as super-corporations absorb disproportionate shares of scattered core business areas across the world. Volkswagen (Ger), Nestle (Sui), PSA Peugeot-Citroen Group and Fiat (Ita) are all notable giants with extensive assets^[5].

But this assessment of market concentration is more than just a cursory or superficial observation, beneath the surface, the profile of monopolisation is a systemic and highly intricate web of suzerainty through ownership and influence. This complex interdependency was described in its greatest depth through research by a team of systems theorists at the Swiss Federal Institute of Technology.

The Zurich team collated share ownerships and financial information relating to some 43,000 TransNational Corporations (TNCs) and constructed a model of shareholder ownership and operating revenues in order to map the structure of economic power. The study unearthed a core group of 1,318 companies with interlocking ownerships, each of which had financial ties to around 20 other companies.

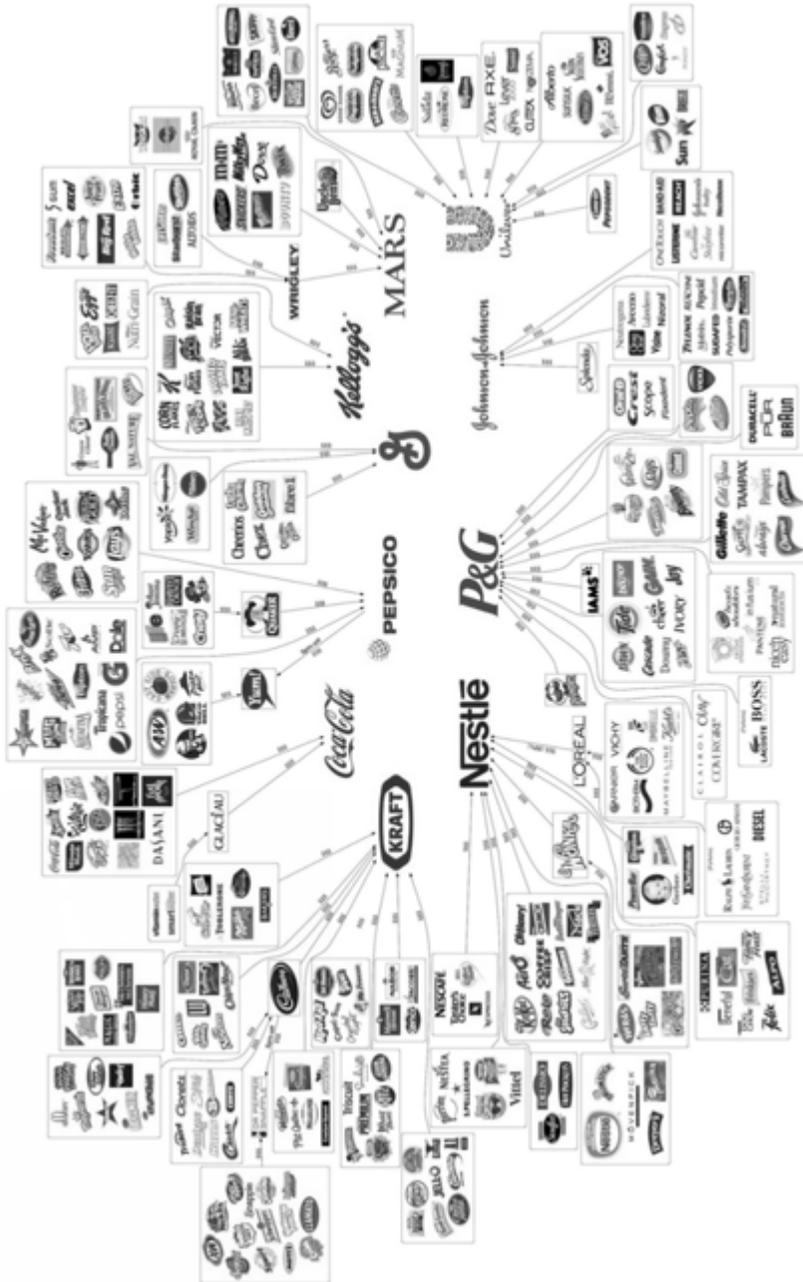


Figure 1.6-2 - Illustrative map of various household sundry manufacturers - Adapted by author from [3]

What is more interesting is that, although this core group represented only around 20% of global operating revenues, the companies collectively owned a further 60% of global revenues through shareholding a majority of the world's large blue chip and manufacturing corporations.

When the web of ownership was further untangled, it was found that an even more tightly knit, "super-entity" of 147 TNCs controlled 40 per cent of the total wealth in the network. This group of companies represented less than 1% of the total network, and included many large financial organisations, such as Barclays Bank, JPMorgan Chase & Co, and The Goldman Sachs Group^[6].

The Myth of New Business Incorporation

Apologists for this level of market concentration will argue that if the hard statistics are perused, the number of active companies is actually on the rise. Figure 1.6-3 and Table 1.6-1 are included based on evidence from references [7] & [8] issued to the United Kingdom's Companies House registry by the UK government's department for business and innovation skills, at the time known as DTI.

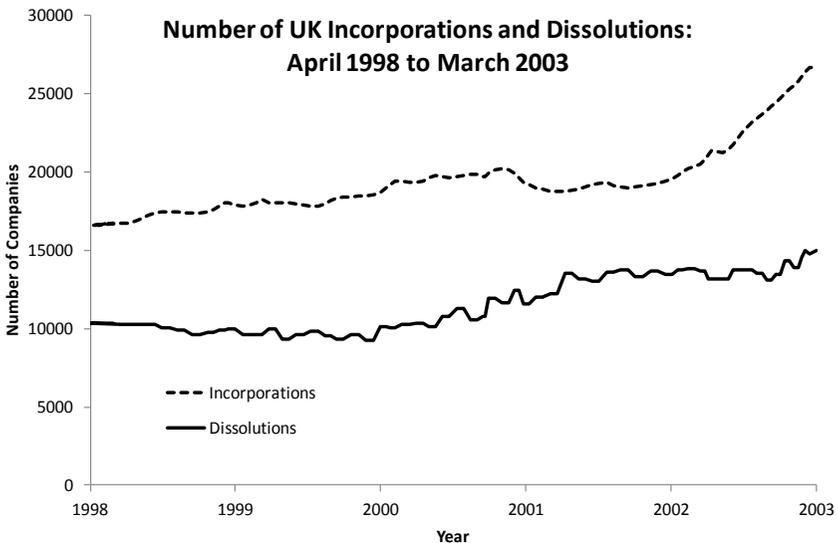


Figure 1.6-3 - Plot of UK business dissolutions and incorporations (1998 to 2003) - Plotted by author from [7]

	2001-2	2002-3	2003-4	2004-5	2005-6
On register at start of period	1595.5	1658.2	1804.1	2016.7	2160.2
New incorporations	225.51	325.9	390.2	333.7	372
Dissolutions	164.1	182	179	191.5	212.1
Restored to the register	1.3	2	1.4	1.3	1.4
On register at end of period	1658.2	1804.1	2016.7	2160.2	2323.1
Of which in liquidation	68.6	70.3	69.6	67.7	66.9
In course of removal	98.1	94.1	104.3	112.2	126
Effective numbers on register at end of period	1491.5	1639.7	1842.8	1980.3	2130.2

Table 1.6-1 - Numerical data for UK business dissolutions and incorporations (2001 to 2006) - Adapted by author from [8]

The figures suggest trends to the opposite of findings detailed in this book, with dissolutions lagging behind incorporations for the period over the new millennium. Table 1.6-1 also shows that from the year 2002, the number of registered companies in the UK continued to steadily rise.

While this may point to a healthy corporate gene pool, with new companies being started at a rate quicker than those absorbed or merged, section 4, table B2 of reference [8] showed that the following companies (shown in Table 1.6-2) were registered in 2005-6, and contributed toward the information displayed in Table 1.6-1.

Barclays Capital Asia Holdings Limited
Barclays Capital Japan Securities Holdings Limited
GE Commercial Financial Services Real Estate Properties Limited
Hilton HHC Limited
Hilton HIH Limited
Wolseley Finance (Emperor) Limited
Wolseley Group Holdings Limited

Table 1.6-2 - Selection of companies taken from section 4, table B2 of [8] - Counting toward incorporation rate for 2005-2006

The official companies register bizarrely counts all formed subsidiaries of larger corporations as new companies in their own right. Barclays is an established UK banking corporation listed as 21st largest company in the world^[9], while Hilton ranks as the 43rd largest in the world^[10], owned itself by the even larger Blackstone Group. Yet here, wholly owned subsidiaries, which even bear the larger corporation's name in their title, are being tallied independently of their parent organisations as new incorporations. The gargantuan General Electric even makes a contribution, with a third or fourth tier subsidiary being counted

toward the statistics. Elsewhere in the register, other large groups are listed as new incorporations multiple times, with new subsidiaries or business structuring.

What is the conclusion to all this? The fact is that government statistics do not accurately model the nature of the industrial stagnation we are moving towards. If subsidiaries of large companies are counted in these statistics, then the data cannot accurately give insight into the rates of incorporation versus dissolution and absorption.

The growth of large companies as they absorb, merge with or buy out smaller companies is represented here as a growth in the market, which economically makes sense, as globalised corporations do tend to bring in a disproportionate percentage of national GDP^[11] and are indicators of a strong economy. However, this is categorically not a growth in the business gene pool.

If statistics only counted top tier corporate groups and independent companies, then given what we can intuitively observe, the trend would likely show a decline. This information is however is not easily obtainable, simply because government agencies do not see this progression as an issue, or in some cases, are complicity in handing power to the already powerful and eager to mask such a trend (see chapter 1.7).

The Effect of Innovation and Entrepreneurship

The idea of innovation is as axiomatic and ingrained a dogma as the market possesses, and it is lauded by economists and market proponents alike in defence of the system. The concept here is that the dynamism of competition acts to undermine ineffective firms, regardless of size. As such, young, agile firms constantly challenge larger ones with new, efficient and disruptive business models, opening new markets and technological opportunities in their wake.

The data presented in the previous subsection is not entirely inconsistent with this ideal, but it none-the-less seems strange that so much of this new, dynamic incorporation is actually guised under established corporate activity. The ideals of public opportunity and innovation, driven by the profit motive are the mainstays of modern capitalism, but is this really as commonplace in a developed world economy as is claimed?

Once again, official figures published by the USA's Small Business Advocacy seem to back up these age old claims, stating that small businesses represent 99.7 percent of all employer firms and employ half of all private sector employees^[11]. This would suggest that at least in America, the entrepreneurial

spirit is very much alive and well, however further scrutiny of the truths behind these figures reveal a different story.

While it is stated that 99.7% of employers are small firms, the report also mentions that of these firms, only half exist 5 years later^[11], so while the rate of production of businesses is rapid, a great many of these have limited staying power, and succumb to an unenviable attrition rate. Flipping this statistic on its head also reveals an unsettling fact, as if small business represents 99.7% of all employers, but only employ half of private sector employees, then a tiny 0.3% of private businesses must account for the other 50% of private sector employment. This tiny concentration is where one will find the payrolls of the General Electrics and The Disney Corporations.

One must also question the definition of a small business here. The SBA defines a small business based strictly on either a number of employees (usually under 500 in most industries^[11]) or a relevant revenue threshold. No consideration is given to shareholders, corporate suzerainty or ownership. It is entirely possible that the data for small business incorporation in the U.S. takes into account small and medium sized subsidiaries of larger corporations, treating them as distinct businesses in the same way as the incorporation data from the UK's Companies House does. If this is indeed true, then the data projects an even bleaker picture of the market.

Professor Scott Shane, author of *The Illusion of Entrepreneurship* has studied the plight of the modern entrepreneur in great detail. Shane is separated from his peers by the fact that he peruses hard data rather than folklore in analysis of the true state of entrepreneurial business in the developed world. So according to these analyses, what is the state of entrepreneurship in economies dominated by 0.3% of businesses?

Figure 1.6-4 shows that both corporate and non-corporate self employment in the USA remain fairly steady between 1989 and 2003, with the total figure declining slightly. Zooming out further, Shane presents that fact that the rate of self employment in the U.S. economy in 1980 was significantly higher than in 2004 (Figure 1.6-5). The trend is in no way isolated, as the self employment rates between 1955 and 2002 fall in all OECD countries apart from the UK, Portugal and New Zealand^[12].

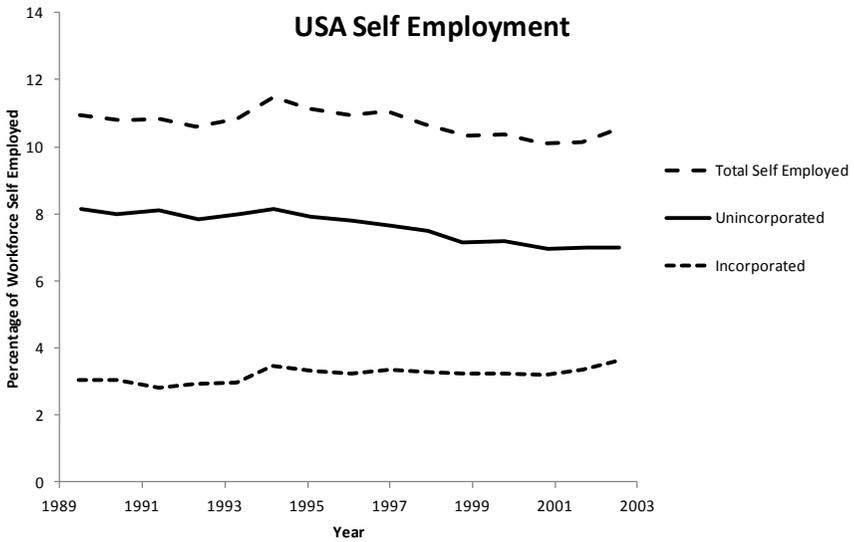


Figure 1.6-4 - Plot of USA Self Employment rates 1989 - 2003, including incorporated and unincorporated figures - adapted by author or from [12]

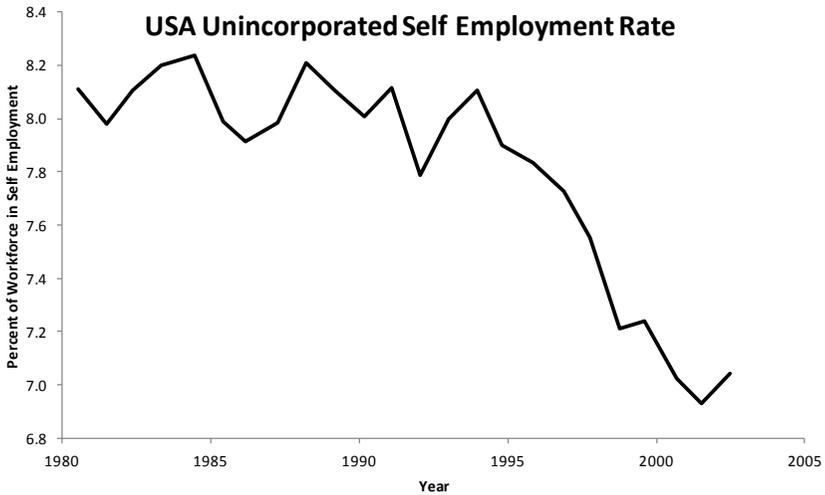


Figure 1.6-5 - Detailed plot of USA Unincorporated Self Employment rates 1980 - 2004 - adapted by author from [12]

Figure 1.6-6 shows the OECD countries arranged by self employment rates in 2002. The trend shows that large and globally influential economies such as Germany, USA, UK, Japan and France do not have significant or even above average entrepreneurial activity.

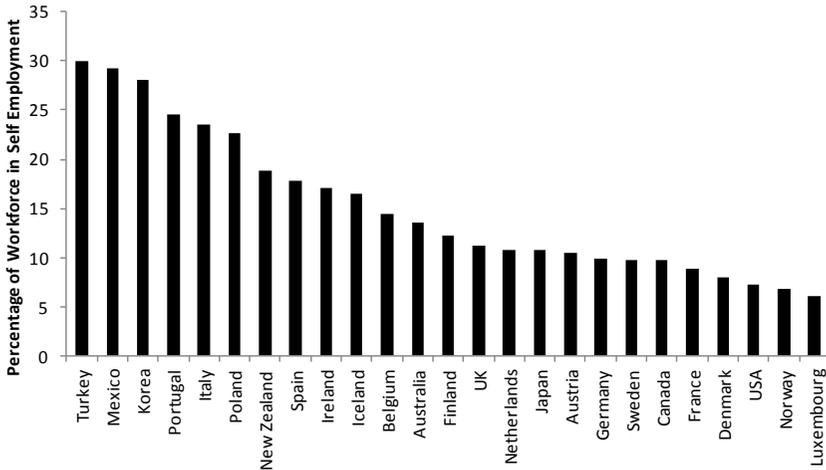


Figure 1.6-6 - Plot of worldwide self employment rates across nations (2002 data) - adapted by author from [13]

In fact, the developed world is generally outperformed by developing world entrepreneurship. The self employment rates show that, within less developed countries such as Peru, Uganda and Turkey, individuals are 3.5 to 4 times more entrepreneurial than the world leading U.S. economy^[13]. This is quite a revelation, as it points to the possibility that as an economy develops, it becomes less entrepreneurial over time.

Shane puts this trend down to the dominance of agriculture in less developed economies, as a percentage of total GDP. Shane shows that this point of view is not unfounded, with a positive correlation of 0.66. Indeed, the nature of businesses founded by entrepreneurship is one very much different to the generally accepted, high growth, high tech companies which we hear about. It is shown that 40% of all start ups lie in construction, retail and professional services alone, while 48% of start ups are based at home^[14].

There is no doubt that entrepreneurship can deliver successful new businesses to the market, but the fact of the matter is that this occurrence is so rare that its effect towards mitigating market stagnation is minimal. Only 3 percent of new start ups are able to grow to a level where they are able to add 100 employees to

their books^[15]. Further consistent growth is far more difficult to achieve. Beyond this threshold, the level of success becomes so concentrated that the top 10% of business-owning households hold 73% of the total U.S. entrepreneurial business wealth^[15].

As such, entrepreneurialism cannot be considered a cure for the oligopoly problem, simply because the vast majority of entrepreneurial businesses are based in highly populated industries, upon which they have no significant impact. Those few that do make it to the top are so thin on the ground in their numbers that they simply become part of the problem; concentrating wealth and market share into the hands of the few. The fact that entrepreneurial activity has also been in steady decline in the vast majority of developed economies also adds gravity to the situation.

How is it that, while highly successful and market changing entrepreneurial activity is astonishingly low, people are constantly lulled into the belief that the Western world is so conducive of it? The answer is simply common belief and mythology. The culture of the West, America in particular, is rooted in a rugged entrepreneurial spirit, vestigial from the pioneer days of the young nation. The fact that entrepreneurship is no longer in good health is inconsequential, as the culture remains imprinted with such values.

We must however be careful in this analysis, as self employment is not necessarily indicative of entrepreneurship. As Shane's research elucidated, a large proportion of self employment occurs in fields with which the self employer is well versed, but which are relatively static and non-changing. These varieties of jobs are often in professions such as skilled tradesmen, shop or restaurant ownership, or common business such as small scale construction and sales. In order to truly assess the effect of innovation on oligopoly, we must delve into the theory of 'creative destruction'.

Schumpeterian Creative Destruction

Sceptics of a path to monopolisation will often state the force of creative destruction as disproof. Joseph Schumpeter proposed in *Capitalism, Socialism and Democracy*, that innovation pushes the market forward and prevents stagnation. This innovation manifests itself as new technology or new, streamlined approaches which undercut the established giants of the day, and force a change in market dominance^[16]. A typical illustrative example of this would be the progression of photography, with classical film cameras being superseded by Polaroid, which in turn has been superseded by digital

photography; each technology being championed by a new company with a new, disruptive business model.

This view of the market however is based on two powerful assumptions:

A. Large, established companies are not innovative.

And,

B. Companies focus specifically on their respective core markets.

Both assumptions must be true in order for Schumpeterian Creative Destruction to be effective in mitigating oligopoly.

The first assumption is rooted in the belief that new start-up companies are primarily the wielders of new technology, and solely use this technology to challenge the established corporate powers. Is this entirely justified? While technology is often the discipline of rising, meteoric businesses, is it solely where innovation occurs?

Let us pick on an example of recent new wave technology establishing its prominence. Blu-Ray DVDs became the successor to conventional DVD relatively recently, but who developed the technology? Blu-Ray was in fact developed by Sony, Panasonic, Philips and Pioneer^[17], all were well established producers of electronic goods prior to the inception of this technology.

Looking backward, we see that even DVDs themselves were also originally developed by Sony and Phillips, as well as Toshiba^[18], another large and established electronics company. This is not an isolated incident, as if we examine the origins of plasma televisions, we find that the first production of this technology is down to Panasonic and Fujitsu^[19].

If the innovation for creative destruction can come from within the dominant corporations of the day, then while the obsolete products themselves will be creatively destroyed, the market gene pool will remain relatively unchanged. A prime example of this innovation from within would be Sony, who were market leaders with both the Walkman and the Discman, and still remain competitive today with mp3 players. Sony did not disappear when technology shifted; it simply adapted and innovated along with the market.

Empirical research has also supported this loose observation. Based on National Science Foundation (NSF) data from the 1950s and 1960s, it was found that the

likelihood of a firm conducting research and development (R&D) increases with firm size and approaches 100% among the largest corporations^[20].

Scherer (1965)^[21] observed that while inventive activity (whether measured by number of R&D personnel or number of patents), increased more rapidly with growth in smaller corporations up to a threshold, the relationship between corporation size and R&D activity continued to grow approximately proportional to the company size. It is therefore clear that while small firms have some productivity benefits over their larger or more established counterparts, they typically have less R&D activity, a smaller turnover of patents, and are certainly not in a position of overwhelming advantage.

Similarly, calling up the second assumption, if a company has its finger in more than one pie, so to speak, then the effect of creative destruction on the market gene pool is also nullified. To illustrate this, consider the case of Apple versus Microsoft solely on the basis of their original core business market; computer operating systems. Based on creative destruction, Apple have almost certainly lost to Microsoft in this arena, as global web statistics show that 91% of personal computers with internet access run Microsoft Windows as of 2009^[22]. Yet we can plainly see that Apple has not been 'destroyed', nor has their ability to release OS products; why is this?

If we take into account the additional core markets which the companies accrued throughout their growth, and even the non-core markets which they have influence over, then we can see a much different story. Apple trump Microsoft in the mobile phone and portable music player markets, while Microsoft dominate the home video games console market; a market which Apple do not even compete in.

This shows that while innovative ideas can oust products from the market and forge a dominant new company, it does not always oust the original company altogether. As such, the force of creative destruction can prevent or mitigate monopolisation in some cases, but in general practise due to the conglomeration of modern business, and the role that these conglomerates play in technological innovation, the effect is not significant enough to fully solve the problem.

Indeed, even in cases where small companies beat the larger ones to the innovative holy grail, it is not unusual for the larger companies to maintain control of their market share. Take for instance a relatively recent development - the digital camera. The handheld digital camera as we know it was launched in 1991 by a small Californian company called Dycam^[23].

The Dycan model 1 was however unsuccessful in the market, despite its new and exciting technology, and Dycam the company was to become little more than a footnote in history. The technology pioneered by Dycam would ultimately fail to oust the Polaroids, Nikons and Kodaks from their market domination, even though subsequent digital camera manufacturers (many much larger and established) would eventually manage to do so^[23].

For these reasons, it seems that Schumpeterian Creative Destruction is not a silver bullet in preventing concentrations of power within market economies. While the phenomenon may be applicable to actual products and services, the large, established companies who provide them are often able to ride market dynamics unmolested.

Monopoly Economics

Anti-monopolistic sentiments are by no means the reserve of the anarchist or the conspiracy theorist. One of the more vocal bastions of anti-oligopoly vitriol emerges strangely from the field of neoclassical economics. Despite the empirical and scientific reputation which economics strives for, the field of study makes its strong opinion of oligopoly clear. In order to understand this, we must hold our breath and delve into the often mad world of neoclassical economic theory^[25].

Within this worldview, monopoly of a market is an abomination, and there is purportedly real mathematical evidence to compliment this stance. Any market which shows monopolistic tendencies must be reformed towards a market of 'perfect competition'. The word perfect is somewhat of a misnomer here, as the word when applied to economic competition holds a special alternative meaning. Perfect competition merely denotes that the price set through competition matches the marginal cost of production for a given product. This means that the difference between the benefit to social welfare, and the cost incurred by producers to supply this benefit is the largest possible.

The demand curve of a market is considered to represent the rate of change of social welfare in a society. This demand curve is defined as the trend which demand for a given product takes as price changes; this is considered to be downward sloping* (i.e. the higher the price, the less the demand for the product; the lower the price, the higher demand). Similarly, the supply curve is

* *Note that while this is how neoclassical economists assume the market to behave, the demand curve may in fact take absolutely any shape at all^[24]. If you would like to see a brief discussion of why this idea is false, please see chapter 1.9.*

considered to represent the rate of change of cost to the producer; this curve is considered to rise with increasing production (i.e. the more items produced, the greater the cost of production.)

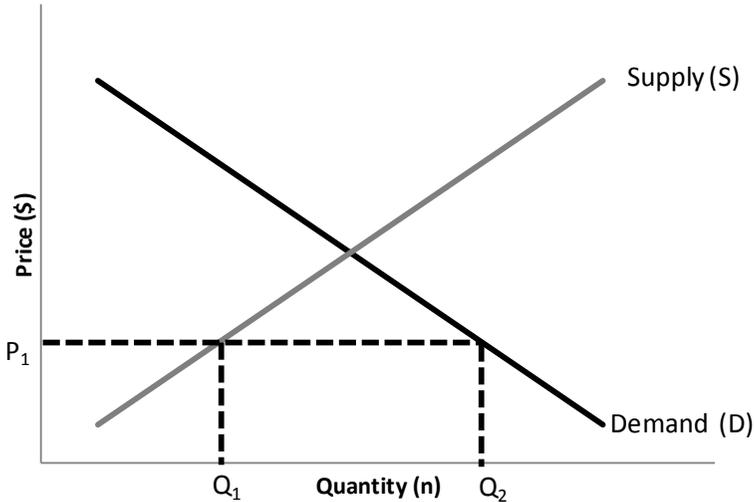


Figure 1.6-7 - The Supply-Demand graph of neoclassical economics - Adapted by author from [25]

This gives rise to the iconic intersection of these two opposing trends (Figure 1.6-8). The maximum benefit to both consumers and producers occurs when these two interests are equal. This occurs where the two lines cross. However, these two criteria only coincide if the price at which these lines intersect is equal to the additional revenue for the producer selling an extra unit of product. This is known as the marginal revenue. By selling at a price equal to the last produced item's marginal revenue, the producer is maximising their profit from production, and the consumer is maximising their marginal utility.

The key prerequisite for this maximisation of producer profit and consumer utility is that, this price at which intersection between supply and demand falls, is also equal to the marginal revenue made by the producer. When these criteria are fulfilled, the producer is happy, as any more, or any less units sold will reduce profit. The consumer base is also happy, as the level of production is at its maximum possible for the given demand, ensuring the optimum price.

This leads us to why neoclassical economists despise the monopoly with such rigor. A monopoly has the entire market demand curve at its disposal, as it is the

only option on the table for prospective consumers. Assuming a downward sloping demand curve (as depicted in Figure 1.6-8), the monopoly must drop its sale price by a certain amount each time the quantity of products sold rises. For each additional item sold, the price must therefore fall accordingly.

Eventually, the monopoly will be producing such a large quantity of goods, that the market approaches saturation and they must sell the goods at a significantly lower price. When this price is sufficiently low, such that selling any further units would actually generate less revenue, the marginal revenue falls to zero and the optimum level of production has been met.

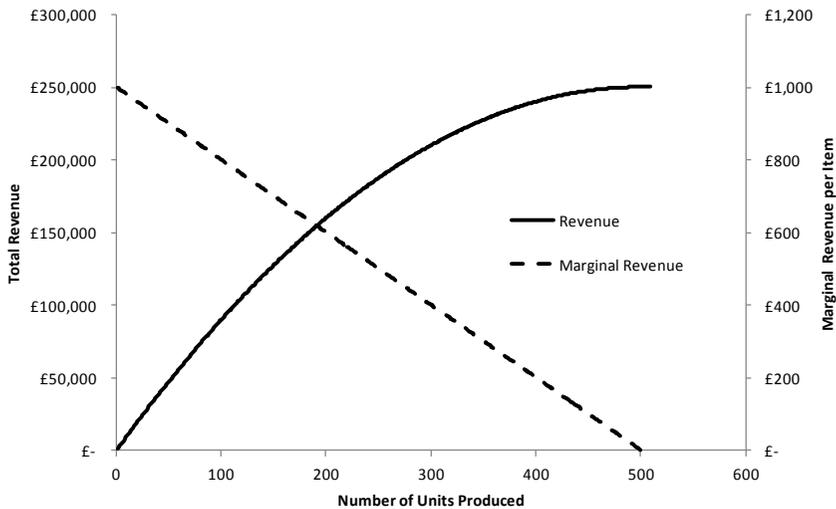


Figure 1.6-8: Theoretical Total Revenue vs. Marginal Revenue - Note that the total revenue eventually levels off and falls as output rises - this trend supposedly gives producers the 'optimum' number of items to sell - Plotted from [26]

However, this optimum level of production is only optimum if the monopoly incurs zero cost in the process of production. Obviously this is not possible, and some compromise must be made between the profit that can be earned and the costs scrawled in the ledger. These costs may be categorised as variable or fixed.

Fixed costs remain, well, fixed, regardless of the level of production. For example, the cost to design an appliance would not differ if many further appliances were sold. Variable costs vary alongside trends in production, for example the level of employed labour. As quantity of output rises, more of these costs will be incurred in order to facilitate the increased production.

Average fixed costs per item sold typically start out rather high, for instance taking the example of a product's design costs, the first handful of units sold will bear the brunt, before higher levels of production cause average fixed costs to fall. Variable costs are traditionally envisaged to fall initially, as the expansion creates economy of scale, before levelling off and rising as diminishing marginal productivity (additional productivity added per unit of cost incurred) sets in.

Due to the different costs in play, and the different magnitudes of these costs at varying output levels, the trends in costs for a monopoly may take a series of complex forms. However, within these cost curves, there will at some level of output be a minimum cost. This occurs due to a phenomenon called rising marginal productivity.

For a given firm, economists define the marginal cost of production as the additional cost to make an extra unit. Similarly to the marginal revenue of an item, the marginal cost will find an optimum value at a given output. This level of output is when the cost of producing an additional product results in a revenue which is less than the current level of production. At this point, the marginal cost equals the marginal revenue.

However, the price that the consumer is willing to pay for this quantity of products is substantially higher than the marginal cost of producing the last item. This is because the monopoly has the entire demand curve to itself and therefore can set prices at the point at which the highest possible profit is gained. Thus, the marginal benefit of the final item produced is higher than the marginal cost incurred by the monopoly, and society may benefit more from increased production.

Because of this, a supply curve doesn't really exist for a monopoly, as all that is required to derive the price is solely a function of the marginal cost and the marginal revenue. As such, it is impossible to derive a supply curve to represent how the monopoly will supply goods at different levels of price.

So what differentiates the perfectly competitive market from the monopoly? In the traditional Marshallian model of the perfectly competitive marketplace, it is assumed that a market is made up of a large number of very small firms. These firms are considered to be so small that their effect upon the market price is zero. Each firm is considered to be non-reactive to its competitors in the market, and acts instead as a profit maximiser. At the market level, the demand curve is downward sloping as depicted in Figure 1.6-7.

As the perfectly competitive firm is small, and sees no change in the market price because of its activity, each firm effectively sees a demand curve which is unchanging with price. This is assumed based on the reasoning that if a small firm increases its prices above the market cost, utility maximising consumers will stop buying the product, while if the firm drops prices, consumers will cause the product to sell out very quickly. As each individual firm is incapable of affecting the market price, the price is set by the intersection of the supply and demand curves at the level of the marketplace.

All firms can thus produce as much as they want at the constant market price. In order to maximise profits, the competitive firm will simply produce until this price is equal to their marginal cost of production. As the competitive firm can sell their product at the market price regardless of their level of output, the marginal revenue is always the same. As such, a supply curve can be derived for a competitive market.

By adding up the supply curves of all competitive firms, the market supply curve can be determined. As all firms set prices in the same way, the market supply curve intersects the demand curve at the point at which the price is the marginal cost of production. Because of this, the market produces goods at a level where the final unit produced is equal to its cost of production. As such, the maximum possible output is produced at the optimum price, and both social benefit and corporate profit are maximised. In contrast, as we have seen, the monopoly sets prices where its marginal revenue (which can vary) equals its marginal cost.

If the above explanation seems confusing or contradictory to you, then you have discovered just one of the many instances where neoclassical economic theory is plainly wrong. Firstly, the assumption that each firm is so small that it cannot affect the market price is fallacious. If the market demand curve is considered to be downward sloping, then any change in output will result in a change in price, however small it may be. The error comes about in assuming that a value which is very small (the change in market price due to the change in a firm's production output) is actually zero.

This assumption may be reliable if simply assessing a single firm within a market, but when this assumption is used to derive a model for an entire marketplace, the credibility of this assumption diminishes. An aggregation of a very large number of small effects is a large effect, as such, the marketplace demand curve cannot be extrapolated from individual demand curves of firms which assume zero effect on the market.

The painful obviousness of this error manifests itself in the very nature of the demand curves considered. If each firm sees a demand curve which is unchanging with price (a flat, horizontal line if expressed graphically), and the market sees a demand curve which falls with rising price (a downward sloping line if expressed graphically), then how can the sum of these many horizontal lines result in a downward sloping line?

The answer is of course that they cannot, and either the assumption that demand falls with price at a market level, or the assumption that demand is constant for the competitive firm must be false*. However, do not take my word for it; the underlying problem with this line of reasoning was unearthed in 1957 by Nobel Prize winning economist George Stigler. Stigler showed in his paper *Perfect Competition: Historically Contemplated* that in fact, the demand curve for a single competitive firm was the same as the demand curve for a market^[27].

Somewhat unsurprisingly, this did not lead to an overhaul of the fundamentals of neoclassical economic theory, but instead was swept under the carpet by economists, and remains a critique which is largely unaddressed in economics courses.

However, the ramifications of Stigler's discovery are far reaching, and reinforce the intuitive logical problems with perfectly competitive markets that have already been outlined. If a demand curve for a competitive firm is downward sloping, then there becomes no significant difference between the way it sets prices in comparison to a monopoly.

This view is further reinforced when contemplating the absence of a marginal revenue curve for a competitive market. A downward sloping demand curve for a competitive market requires that a downward sloping marginal revenue curve also exists. This is done away with by the assumption that competitive firms are subject to a horizontal demand curve, which as we have seen is false.

As soon as it is understood that the marginal revenue curve slopes downward for the market, and that the market and individual firms observe the same demand curve, a quandary arises. If competitive firms observe a marginal revenue which falls with increasing output, rather than remaining constant as theorised, then for the firm to set prices at the intersection of the market supply and demand curves, it must produce at a loss.

* *Ironically, as we will examine in chapter 1.9, both of these assumptions are in fact false.*

It is at this point that the entire Marshallian theory of competitive firms collapses. The monopoly and the competitive firms in fact set prices in exactly the same way, by equating variable marginal revenue with marginal costs. Based upon this conclusion, monopolies are on equal footing with small competitive firms, as they behave in exactly the same way. However the reality of the marketplace does not align with this ideal. Such a marketplace would surely have an eclectic mix of firms large and small, rather than the domination of large firms which we have observed.

The reason behind this phenomenon is fairly straightforward. This advantage which large firms exhibit is due to the idea of returns to scale. When returns to scale are increasing, the output of production is increasing at a faster rate than the costs of production at a given level of output. Illustration via real life examples is fairly banal, as large factories have efficiencies which small workshops cannot hope to achieve, large transport vehicles can carry goods more efficiently than a fleet of small ones etc.

The dilemma here is that, if it is acknowledged that large firms have real advantages over the many small firms which perfect neoclassical competition prescribes, then the entire marketplace becomes unstable, and the gene pool of businesses naturally trends towards oligopoly, duopoly, or as a worst case a total monopoly. The neoclassical response to this hole in their reasoning has been to theorise the idea of the 'long run' average cost curve as shown below.

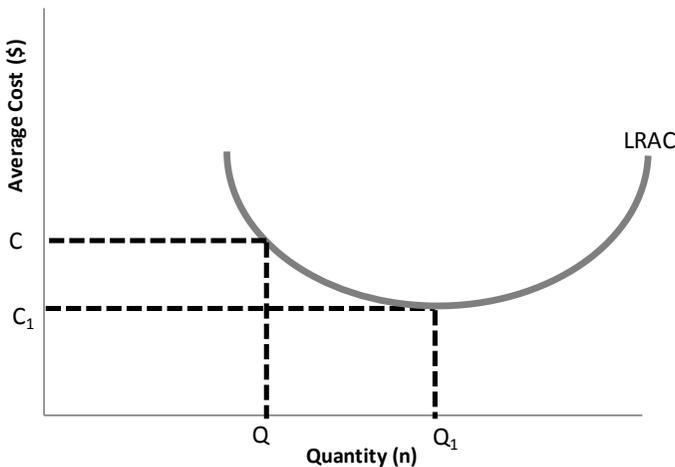


Figure 1.6-9 - The Neoclassical Long Run Average Cost (LRAC) curve - adapted by author from [28]

The long run cost curve posits that there exists an optimum size for a firm, and that under competitive circumstances, all firms within the industry will trend towards this scale. Even if this scale is large, as it may well be, all firms would converge to a similar size, negating any instability in the marketplace due to larger firms purchasing smaller ones.

Economist, Piero Sraffa critiqued this essential idea in his paper, *The Law Of Returns Under Competitive Conditions* drawing the observation that few economies of scale could be characterised as benefitting all firms within an industry equally^[29].

Furthermore, it is absurd to posit that every industry can be occupied by a plethora of gigantic firms. Some industries are simply not inclined to support such a large number of firms, either by the nature of their cost structure*, control of patents or simply the available workforce. It is likely that if thousands of firms the size of Verizon and AT&T (each with around 200,000 employees^[30]) were competing in the telecommunication market, then most of the workforce in the USA would have to work in telecommunications.

The long run cost also does not consider the concept of time[†]. The cost savings available to each firm are available as soon as the market is established. As such, as soon as one firm begins to exploit these scale advantages, the industry again becomes unstable. The only remedy for this is if the industry is sufficiently large as to allow a large number of firms of the optimum size from day one, or if all firms within the industry start at exactly the same scale and grow towards the optimum scale at exactly the same rate, scenarios which are of course wildly unlikely in reality.

To further hammer home the inadequacy of the neoclassical model of a competitive market, Economist Steve Keen has developed a model of a competitive market^[32] which adheres to the assumed behaviour of the Marshallian firm (however inaccurate these assumptions may be in reality). The results are somewhat unsurprising; for a given demand, both total output and market price remain approximately constant, regardless of whether the industry contains a single monopoly, or 100 competitive firms. This is shown in the following figures.

* William Baumol presented the idea of a natural monopoly in 1977^[31]

† Few neoclassical models are time-variant

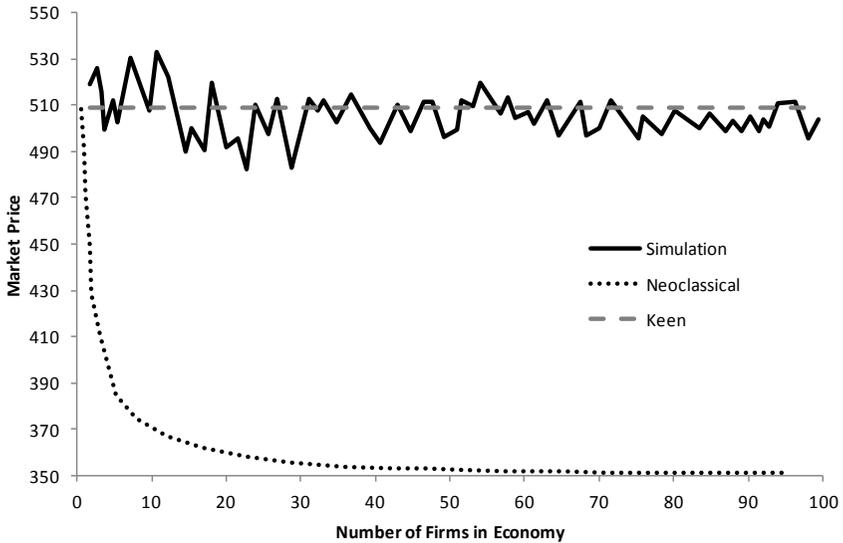


Figure 1.6-10: Market Price Level vs. Number of Firms in the Economy - Note that the neoclassical model predicts a constantly falling price with a more competitive market, while the actual model shows that price remains fairly constant around an unchanging average - adapted by author from [32]

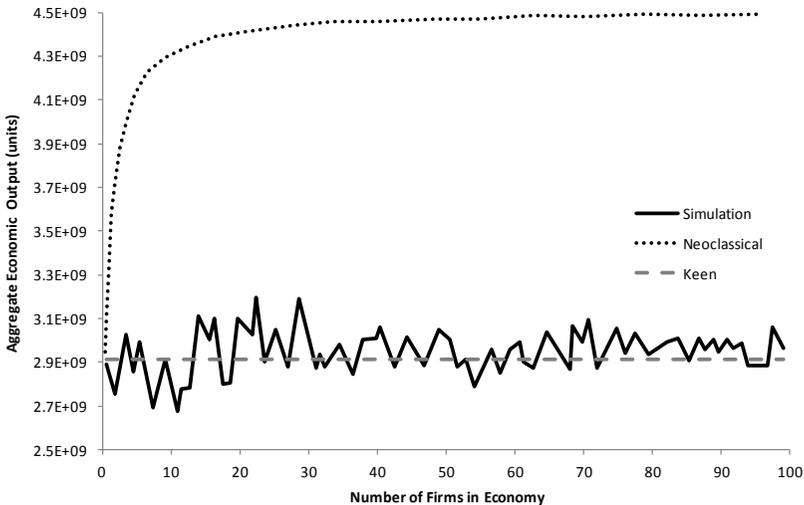


Figure 1.6-11: Production Volume vs. Number of Firms in the Economy - Note that the neoclassical model predicts a rising output level with a more competitive market, while the actual model shows that total output remains fairly constant around an unchanging average - adapted by author from [32]

The outcome of this assessment is somewhat embarrassing for the neoclassical economist, as he is one who inadvertently creates what he derides. 'Perfect' competitive firms neither hold any advantage over monopolies, nor offer any additional social benefit to society. Not only this, but the basic dynamics of market interaction seem to favour larger firms over smaller ones, due to the concept of returns to scale.

The dominant school of mainstream economic thought however remains reluctant to face up to the truths of this matter and revise its core methodologies. If economics were a backwater field of study with little relevance to everyday life, then perhaps this mere embarrassment would remain as such. But, the fact that so many lives and livelihoods today are hopelessly under the suzerainty of politically powerful monopolies – monopolies allowed to develop due to the folly of economists - transcends embarrassment.

The policymaking of neoclassical economists which rests so snugly upon the broad belief that markets are fundamentally stable, stands in total opposition to the reality of the market we see before us. The reality of the matter is that monopolies and oligopolies form entirely under the inherently unstable dynamics of the free market.

The Effects of Oligopoly and Market Consolidation

The theatre of economics is fairly split on the concept of monopoly. While the neoclassicists will staunchly denounce monopoly on the grounds of marginal utility, Austrian school devotees, such as the ever eloquent von Mises would write at great length as to the benign nature of monopoly;

"If, then, we consider the effects of monopoly without being biased by popular writers on cartels and trusts, we can discover nothing which could justify the assertion that growing monopolization makes the capitalist system intolerable. The monopolist's scope in a capitalist economy free from state interference is much smaller than this type of writer commonly assumes"^[33]

Von Mises of course falls into the typical economic rejoinder that a market must be 'free' from state intervention in order to function in an optimally effective manner. I would hope that having read the opening chapter of this section, the reader groans as loudly as I do when social ills are blamed upon the lack of market 'freedom' in an economy.

However, von Mises does touch on a point that is worth expanding upon. The relationship between state and corporation is a complex one, and is no doubt relevant when perusing the concepts of oligopoly and market consolidation. However this analysis hold sufficient gravity to merit its own assessment in chapter 1.7.

What is of interest here is why the Austrian school view monopolies as 'tolerable' within their conceptual capitalist economy, free from state interference. As we have already discussed in our assessment of Schumpeter's Creative Destruction, there is not a particularly pronounced difference between the innovative behaviour of large firms when compared to small ones, so economies trending toward oligopoly are perhaps not the glut on progress that they are thought to be*.

Similarly, neoclassical literature does not fare so well either (as it seldom does). When the aggregation errors within the concept of the ideal Marshallian firm are ironed out, neoclassicism cannot determine any fundamental difference between the marginal utility generated by an economy run by a single firm, or a thousand smaller ones. So was von Mises correct? Is monopoly actually a harmless circumstance of capitalism running its course?

While the neoclassical school struggles with its model for prices in a monopoly, and the Austrian school proudly claims that monopolies which are not involved in government collusion are benign, we look to the real world, and unfortunately we find ample examples of large corporations rigging prices.

More tellingly, much of these price fixing schemes are being operated by businesses that have not been groomed for governmental 'natural monopoly' contracts, nor are they conspiring with governments in order to impose these underhanded techniques. What we have instead is limitless examples of corporations who have, by hook-or-crook, come to some degree of dominance in their field, and proceeded to collude with other dominant corporations in order to keep prices artificially high.

In August 2014, NGK Spark Plug Co. Ltd., a giant Japanese automotive component manufacturer, plead guilty for its role in a far reaching conspiracy to fix prices and rig bids for spark plugs, standard oxygen sensors, and air fuel ratio

* *This should not be taken as a statement that the market economy is efficient at developing and properly exploiting new technologies, as this is tackled in chapter 1.12. Instead, this simply states that within a market economy, large, more dominant firms are pound-for-pound roughly as innovative as smaller ones.*

sensors sold to car manufacturers around the world. The company was ordered to pay a \$52.1 million criminal fine^[34].

In October 2005, electronics manufacturer Samsung plead guilty to conspiring with other companies to fix the price of Random Access Memory (RAM) for computers. Samsung was fined \$300 million, the second largest antitrust penalty in U.S. history^[35]. In 2014, the French government fined 13 perfume and cosmetics brands (the largest of which being L'Oréal) for price collusion between 1997 and 2000^[36].

However, as significant as these price fixing schemes between large corporations seem, they are left in the dust by the now infamous LIBOR scandal. The scandal arose when it was discovered that banks had been falsely inflating or deflating their interbank lending rates so as to profit from trades. At time of writing, it remains unclear just how long this scandal had been running, but Andrew Lo, Professor of finance at MIT stated that the LIBOR scandal "*...dwarfs by orders of magnitude any financial scam in the history of markets.*"^[37] The colluders within the LIBOR scandal have attracted fines well into the hundreds of millions of pounds.

While these fines point to the severity of the situation, without evidence of the effect on the general population, we cannot rightly comment on the effects of market consolidation. It has been estimated that the ramifications of LIBOR fixing cost U.S. municipalities over \$6 billion^[37], which is money that must ultimately hit the American taxpayer in the pocket.

Elsewhere, price fixing of dairy products amongst major UK supermarkets, including Tesco, Asda and Sainsbury's, cost consumers an estimated £270 million in 2011^[38]. The so called 'big six' in the UK energy market has also been drawn into controversy, when it emerged that many households are paying as much as £250 a year too much on their energy bills^[39] due to price collusion between the firms.

Despite the clearly serious effects of oligopoly to the average member of the public, this is not necessarily the most serious or obvious effect of the concentration of markets into a small number of large players.

The lesser discussed effect of this level of consolidation is that it increases the instability of the system when perturbed. The same Zurich team who discovered the 'super-entity' of 147 companies also assessed the global economy as a complex system, something that most linear, time-invariant economic

philosophies have yet to grasp. What they found was higher degrees of market consolidation amongst a small group of giant corporations could only be achieved by very high levels of interconnectivity (share ownership, etc). This meant that when one of the larger companies experienced difficulty, the effect propagates more rapidly, and with greater severity^[40].

Conclusions

As a return to the direction of this section; we must assess first, whether the evidence presented here constitutes a negative effect upon civilisation, and secondly, whether that effect stems from the incentive structure of the market system.

As we have perused, the effects of oligopoly and monopoly are mixed, but at the absolute best seem to be neutral with regard to social benefit. The critique of neoclassical economics shows that there are no true conceptual differences between the way that a Marshallian economy of 'ideal-sized' firms sets prices when compared to a full monopoly. Consequently, much to Schumpeter's dismay, there is also not necessarily any reason to believe that smaller firms hold an unassailable advantage over much larger firms in terms of competitiveness or innovation.

However, as we have also seen, other effects of oligopoly are not as benign. The concentration of power, wealth and influence within a small number of large corporations can lead to financial instability and rapid propagation of issues to other actors within the economy. Furthermore, as we will see in the next chapter, this wealth and influence is readily used to hijack and subvert government institutions, the effects of which can be profoundly damaging. Control over markets by a small number of large firms can also lead to price fixing, which ultimately is an exercise to artificially boost profit to the detriment of social welfare.

Given the above phenomena, it seems valid to argue that within the scope of the market economy, the oligopoly is generally damaging to human civilisation. What we must however discuss is whether the phenomenon of oligopoly is a natural outgrowth of the market incentive structure, or whether it is some aberration of the market economy that occurs for other reasons.

Economists, regardless of school, will generally argue that the concept of monopoly is some form of perversion of a market economy, although they will typically quibble over the details. The erudite Austrians will accept some degree of subdued monopoly as a natural outgrowth of the market incentive, but will

turn the blame upon the meddling government as soon as any serious consequences occur. More classically minded economists will suggest that the lesser marginal utility of a monopoly will inevitably be eroded by the more beneficial and competitive Marshallian firms; the blight of monopoly can therefore only be maintained through some other, non-market force.

I however see much evidence to suggest the opposite. System theorists who have assessed the global economy unearthed a level of concentration which may have surprised economists and policymakers, but their discovery was not particularly shocking when viewed through the lens of complex self-directed systems. George Sugihara, is an expert in theoretical biology who has written extensively on the topic of capitalist economies as ecological systems. His assessment of the Zurich team's analysis into corporate interconnectivity was one of nonchalance - "*Such structures are common in nature*" he said^[40].

The tendency for self directed systems to organise chaotically into complex oligopolic structures is fairly well trodden in ecological science, and much of Sugihara's work has been an attempt to broach this topic with economists. Furthermore, the inherent instability of the resulting systems, and the propensity for these systems to 'regime shift' or flip chaotically from one state to another (e.g. the financial crisis of 2008) is mathematically quite well understood^[41].

What is key here is that these models of complex systems which mimic the global economy with such a robust level of accuracy can be created with nothing more than self direction. There is no requirement to model a state or government into these systems in order to create an oligopolic structure, or to induce a regime shift in which the complex system falters or collapses.

So if an oligopoly can theoretically emerge within a computer model of a self directed system, and nature yields examples of similar structures as a result of nothing more than the above, then is it not sensible to suggest that the self directed market incentive is equally able to create such concentrated structures?

I would argue that this is a sound conclusion, and the ignorance of the schools of economics to attempt to explain away these phenomena with ideological critiques of the government is reckless and misguided, especially considering that anti-trust laws are often the only actual barrier to price fixing and other oligopolic mischief.

As such, while it is possible in many cases for corrupt governments to create a platform for monopoly through large public contracts (the Austrian idea of the

'natural' monopoly), monopolistic practises are in no way an exclusive governmental phenomenon. As we have shown, oligopoly is an outgrowth of the self directed market incentive in its most basic form, and its effects upon human society are largely negative.

Chapter 1.6 - References and Notes

- [1]. Thomas J. DiLorenzo, *The Myth of Natural Monopoly*, The Review of Austrian Economics, 1996, also available online at - <http://mises.org/daily/5266/>
- [2]. Barry C Lynn, *Cornered: The New Monopoly Capitalism and the Economics of Destruction*, John Wiley & Sons; 1 edition, 23 Dec. 2011
- [3]. *Here Are The 10 Corporations That Control Everything You Buy*, Higher Perspectives, April 30, 2015, <http://higherperspectives.com/illusion-of-choice/>
- [4]. Barry C Lynn, *Cornered: The New Monopoly Capitalism and the Economics of Destruction*, John Wiley & Sons; 1 edition, 23 Dec. 2011
- [5]. *Ibid*, pg 82-85
- [6]. Stefania Vitali, James B. Glattfelder, and Stefano Battiston, *The network of global corporate control*, 19 Sep 2011
- [7]. DTI (Now Department for Business and Innovation Skills - BIS) Annual Report - Companies in 2002-2003
- [8]. DTI (Now Department for Business and Innovation Skills - BIS) Annual Report - Companies in 2005-2006
- [9]. *The World's Largest Companies*, Forbes - available online at www.forbes.com
- [10]. *Ibid*
- [11]. SBA - Office of Advocacy - Frequently Asked Questions Memo - Sept 2010
- [12]. Scott A. Shane, *The Illusions of Entrepreneurship: The Costly Myths That Entrepreneurs, Investors, and Policy Makers Live By*, Yale University Press, 2009, pp13-14
- [13]. *Ibid*, pg 15
- [14]. *Ibid*, pg 68
- [15]. *Ibid*, pp 106-107
- [16]. Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*, Routledge; New Ed edition, 1994
- [17]. Barry Fox, *Replacement for DVD unveiled*, New Scientist, 19 February 2002
- [18]. Jim Taylor, *DVD demystified*, McGraw Hill, 1998
- [19]. L. F. Weber, *History of the Plasma Display Panel*, IEEE Transactions on Plasma Science, Vol. 34, No. 2, (April, 2006), pp.268-278

- [20]. Bronwyn H Hall and Nathan Rosenberg, *Handbook of the Economics of Innovation*, Volume 1, North Holland, 2010, pg 133
- [21]. F.M. Scherer, "Firm Size, Market Structure, Opportunity, and the Output of Patented Inventions," *American Economic Review*, vol. 55, December 1965, pp. 1097-1123
- [22]. Data taken from Net Applications, <http://www.netapplications.com/>
- [23]. Mike Antoniak, *Digital cameras, the next wave*, Photo District News, June 1, 1991
- [24]. W. M. Gorman, *Community Preference Fields*, *Econometrica* 21, 1953
- [25]. Most of this subsection is taken from the neoclassical economic textbook: Andreu Mas-Colell, Michael D. Whinston, Jerry R. Green, *Microeconomic Theory*, Oxford University Press; 1 edition, 1995 - Some additional insight is taken from: Steve Keen, *Debunking Economics*, chapter 'Size Matters'
- [26]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pg84
- [27]. George J. Stigler, *Perfect Competition, Historically Contemplated*, *Journal of Political Economy*, Vol. 65, No. 1 (Feb., 1957), pp. 1-17
- [28]. Andreu Mas-Colell, Michael D. Whinston, Jerry R. Green, *Microeconomic Theory*, Oxford University Press; 1 edition, 1995
- [29]. Piero Sraffa, *The law of returns under competitive conditions*, *The Economic Journal*, Vol 36, No 144, Dec 1926, pp535-550
- [30]. Data taken from Statista - www.statista.com
- [31]. William J. Baumol, *On the Proper Cost Tests for Natural Monopoly in a Multiproduct Industry*, *American Economic Review* 67, 1977, pp809–822.
- [32]. Steve Keen, Russell Standish, *Debunking the theory of the firm—a chronology*, *Real-World Economics Review*, Issue 53, 2010
- [33]. Ludwig von Mises, *Socialism: An Economic and Sociological Analysis*, Liberty Classics; 6th edition, 1981
- [34]. U.S. Department of Justice Press Release, *NGK Spark Plug Co. Ltd. Agrees to Plead Guilty to Price Fixing and Bid Rigging on Automobile Parts Installed in U.S. Cars* Tuesday, August 19, 2014
- [35]. U.S. Department of Justice Press Release, *Samsung Agrees To Plead Guilty And To Pay \$300 Million Criminal Fine For Role In Price Fixing Conspiracy*, Thursday, October 13, 2005
- [36]. Gaspard Sebag, *L’Oreal, Unilever Fined \$1.2 Billion by French Antitrust Arm*, *Bloomberg Business*, December 18, 2014

- [37]. O'Toole, James "*Explaining the Libor interest rate mess*". CNN, 10 July 2012, and; Darrell Preston, *Rigged Libor Hits States-Localities With \$6 Billion: Muni Credit*, Bloomberg Business, October 9, 2012
- [38]. Sean Poulter, *£50million fine for Great Milk Robbers: Price fix by supermarkets cost shoppers £270m*, Daily Mail, 11 August 2011
- [39]. *British Gas 'blackmail': As Big Six energy firms finally face price-fixing probe, one boss comes under fire for raising spectre of blackouts*, Daily Mail, 28 March 2014
- [40]. Stefania Vitali, James B. Glattfelder, and Stefano Battiston, *The network of global corporate control*, 19 Sep 2011
- [41]. Robert M. May, Simon A. Levin and George Sugihara, *Ecology for bankers*, Nature, Vol 451, 21 February 2008

1.7 Fusion

EVER SINCE 2009, the American right wing has been bubbling with a unique, but undeniably potent, grassroots movement known as the Tea Party. Taking its name from the iconic Boston Tea Party, and the historic opposition to the derided tea tax, the Tea Party has garnered a significant following in the populace. In addition to swelling numbers, the movement has also attracted attention from numerous American Republican politicians, commentators and pundits.

The message behind the Tea Party however is a confused and often contradictory garble of libertarianism and anti-state rhetoric, which rails on absolutely anything tarred with the brush of government. Socialism is a four letter word amongst this movement, and free market fervour remains the *raison d'être* for many bearing its cause.

However, the mere existence of the Tea Party attests to the fact that there is something wrong within the traditional party political system. It is clear that these people are not simply a band who arose in opposition to nothing. Sweeping aside the levels of vitriol which the movement directs toward government, we can see a movement of generally middle and working class people who are deeply frustrated with the current order, and see the free market as the only viable solution.

Given all that we have seen relating to the pseudo-free market, the values it encourages and the behaviours it necessitates; how can such a movement of people who have suffered immeasurably in an economy crushed by unregulated debt trading, raise their pitchforks against the government? After all, it was governmental regulation which at least attempted (admittedly in misguided ways) to prevent such a crisis. The answer to this as always is not simple, but it falls under the vast umbrella of a topic that we will cover presently.

The monopolisation of industries within relatively small circles of shareholder businesses has already been covered in the previous chapter. While the effect of this upon the market gene pool has been considered, and is largely viewed as

negative, the further societal ramifications of this consolidation of wealth and power go beyond what we would call the 'market'.

Specifically, the intrusion of influence from powerful corporations into the sphere of government and associated institutions will be broached in this chapter. As we will see, this fusion of corporation and government is a phenomenon which skews and distorts any semblance of democracy, which distorts public perceptions of reality, and which acts to reinforce the inherent oligopolic tendencies of the market covered in chapter 1.6.

A Pocket Government

The role of government in social philosophy is a beleaguered and bloodstained topic. Commentators and writers from across the spectrum have put together compelling arguments for and against the divisive leviathan. From the governmental idealists in the socialist school of thought, to the staunchly market oriented modern libertarians, and every increment between these stances, the extent of the state has been discussed to the point of exhaustion.

Yet despite this, most developed societies today exist somewhere between the middle of the two extremes^{*}, with some form of government usually providing a proportion of the society's needs, and a marketplace providing the rest. Within this 'happy medium' range, social discourse typically follows a similar template the world over; the government is expected to keep the peace and administrate the realm, while passing legislations that mould the market incentive into its most beneficial form.

Depending on which voter you speak to, the government's management of the market is expected to be anything from drafting regulatory laws which businesses must follow, or stepping out the way to let the 'free' market do what it does best. Having covered much of this in chapter 1.1, the second of these stances is (I would hope) lying in tatters on the ground by now, but the first of these stances is also rife with oversimplification and logical inconsistencies.

So why is regulation of the market also a problem here? As we have seen in the first chapter, the chaotic, self directed motive of the market is one that has been reined in by state intervention for hundreds, if not thousands of years, and those reins are only getting tighter with time. The days of openly employing children or buying human beings are over, and as our knowledge increases, it is likely

** There are of course outlier countries, such as Somalia or Western Sahara which feature almost no government, or the likes of North Korea which have nothing but government. I would not personally recommend living in either.*

that more unseemly practises will slip into the lexicon of taboo. So why not continue on this course, with government overseeing a whirring marketplace, and guiding it back to even keel when it makes a wrong step?

The reason why this is a fraught path stems from the basic fact that the government is made up of people, and these people exist within a paradigm of waged labour. When governmental decision makers operate within a culture that is centred upon consumptive, consumerist and acquisitory ideals (as we have seen in chapters 1.2 and 1.3), then it is only natural that they too will strive towards similar aims. When these human goals are placed upon a platter, it becomes disconcertingly easy for policymakers to be led astray by market influence.

The result of this is not a government which moulds the market into the most beneficial form for society, but instead a marketplace which moulds the government for the market, and specifically for the oligopoly which dominates that market at the time.

While much of this 'back-scratching' hovers within the perception of the general public, the scale of the issue is one which I believe escapes full comprehension. Come election time, much of the electorate still believes that the economic situation of the country rests upon the shoulders of the party they select, rather than the fundamental nature of the market at that point in time. In the main, the public still views government as a series of institutions with the primary role of monitoring and managing the socioeconomic health of the country, and not instead as an entity which is symbiotically intertwined with the marketplace.

In 1995, University of Massachusetts political science professor, Thomas Ferguson authored his seminal work; *Golden Rule: The Investment Theory of Party Competition*. In this analysis, Ferguson argued that the policies of political parties, and the issues they campaign on, are driven entirely by the interests of business and wealthy investors.

Within this model, political parties compete on platforms which broadly represent common business models within the economy, such as capital-intensive versus labour-intensive; isolationist versus internationalist, etc. As the balance of oligopoly within the economy shifts with new technology or markets, influential corporations or investors are forced to alter their business models, and thus their requirements of government also change. Ferguson calls this phenomenon 'realignment', and argues that this accounts for the change in the

political party in power over time, rather than the conventional view that political change is based upon the changing behaviour of voting groups^[1].

Ferguson has illustrated examples of how the investment theory of political competition is applicable to historical elections in great detail, but for clarity we will save these for later in the chapter.

In 2005, Larry Bartels of Princeton University assessed responsiveness to members of the public by members of the U.S. senate using a model of voting patterns and policy support. What was found in this study largely supports Ferguson's view that governmental policy is sculpted by the wealthy and influential. Figure 1.7-1 shows the responsiveness of U.S. senators in relation to the income of various social groups. It is clear that high income citizens receive a much more enthusiastic response from senators, and more pertinently, the level of responsiveness varies accordingly with the wealth of the citizen.

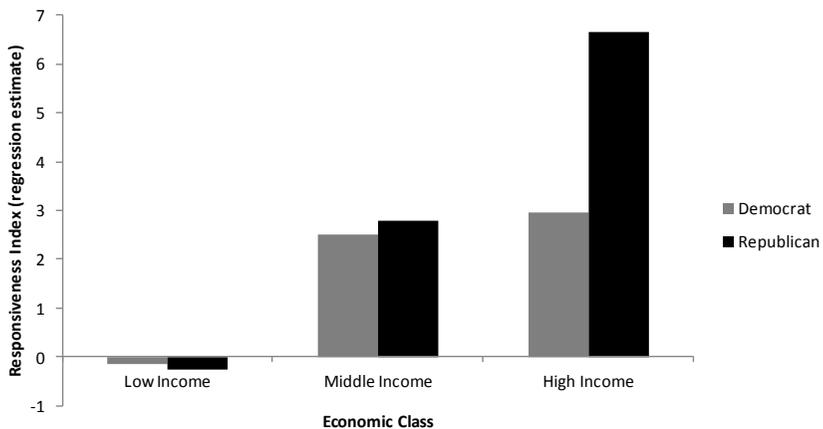


Figure 1.7-1: Plot of U.S. Democrat and Republican senator responsiveness to the requests of Low, Middle and High income citizens. Note that High income citizens are consistently the most influential for both parties, while senators are actually negatively responsive to low income citizens, i.e. will act in the opposite direction to their concerns - Adapted by author from [2]

So why would it be true that high income earners are, on average, given a more receptive ear within the senate house of the United States? Ferguson's theory of investment gives a clear theoretical model as to why this might occur, but what of the finer details?

Fortunately, the balance sheets of American political campaigns yield ample evidence to support the theoretical analysis of Ferguson. In 2012, Republican

presidential candidate Mitt Romney set his challenge to incumbent Barack Obama. In his campaign, which was ultimately unsuccessful, Romney accrued significant donations from large corporations. Figure 1.7-2 shows the top contributions (over \$100,000) made to him during the course of his campaign.

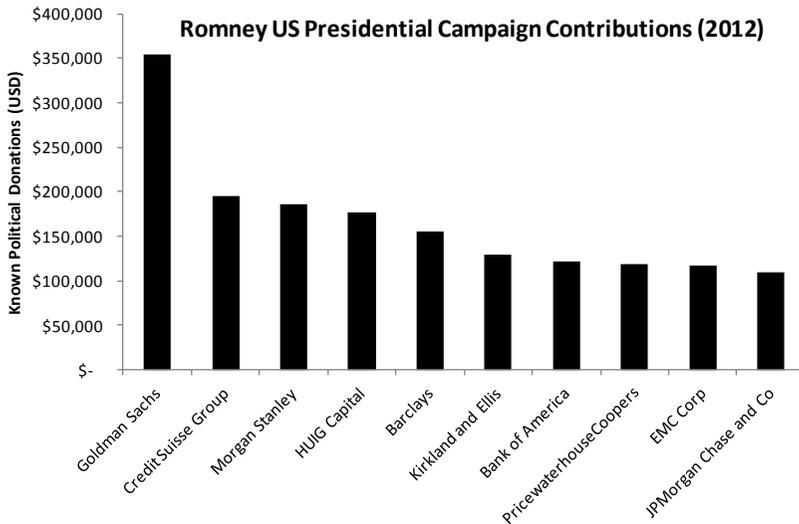


Figure 1.7-2: Plot of Mitt Romney 2012 U.S. presidential campaign contributions (only disclosed contributions included) - Data taken from [3]

Note that of the top contributors to Romney, almost all were large financial services and banking corporations. During his campaign, Romney went on to propose a repeal of the Dodd-Frank act, which would have meant a more lax stance on regulation in financial firms.

“The extent of regulation in the banking industry has become extraordinarily burdensome following Dodd-Frank,” Romney told a roundtable of 18 businessmen at The Common Man Restaurant.

“I’d like to repeal Dodd Frank, recognizing that some revisions make sense,” Romney said. [...]”^[4]

But even the bare faced defence of one's donors' interests is relatively subtle by the standards of modern politics. In 2011, when met with the prospect of a European regulatory framework that would encroach upon the UK's banking sector, Prime Minister David Cameron flew personally to Brussels to fight tooth and nail against an attack on Britain's "national interest"^[5].

The wording here is depressingly Orwellian, as in actuality the democratically elected head of a powerful first world country was dispatched on an errand by a single sector of the British economy. Not only was this errand to brazenly defend the interests of this sector, but it was also to do so in flagrant disregard for the general public which he supposedly represents, as this was barely three years after a global banking collapse that plunged the world into recession.

This absurdity is perhaps more pronounced when counterpointed with the fact that a clear majority of the electorate in Europe is strongly in favour of heavier regulation over banking institutions. The very month before Cameron set sail for the European capital to fight against regulatory legislation, public relations firm Edelman was polling the attitudes of the general public towards the very same. The results are shown in Figure 1.7-3.

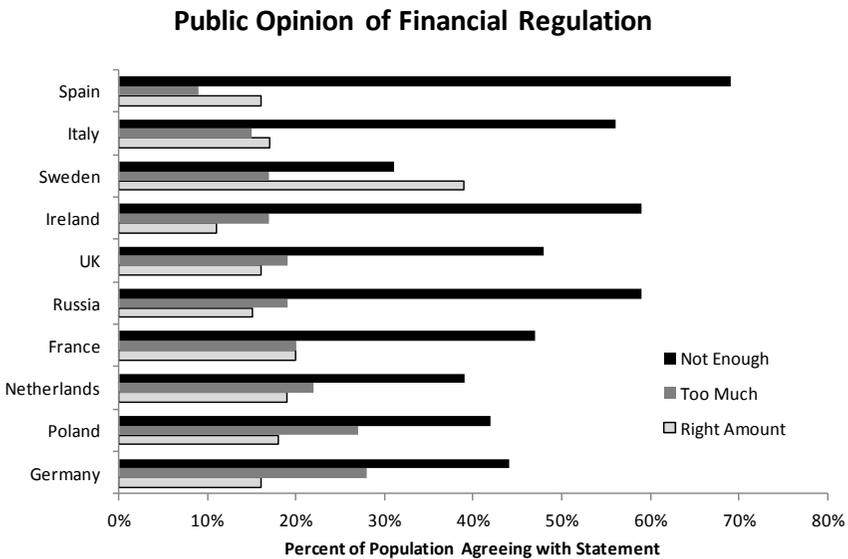


Figure 1.7-3: Public attitude towards financial regulation within the European banking sector (2012) - Note that every country polled, with the exception of Sweden, shows a strong majority in favour of more stringent regulation - Adapted by author from [6]

The results show that a majority of respondents in every polled country except Sweden would prefer more regulation by the government over firms. This trend is very similar across other regions in the world, including Asia and South America. Indeed, only the USA shows a more even spread across the belief that business is over or under-regulated^[7].

The USA is however a world leader in the fusion of corporate and business interests. In 2013, the Obama administration provided subsidies worth over \$20 billion to fossil fuel companies in the form of tax breaks alone^[8]. As any cursory glance at a stock exchange will tell you, fossil fuel corporations are amongst the largest and most profitable enterprises in the world, so why would they merit such a crutch from the U.S. government, when much smaller scale alternative energy companies receive such a paltry amount in comparison?

The reason behind this absurdity lies in a deceptively large and lucrative industry in the USA, one which is not as common or as bloated elsewhere in the world. Lobbying is a profession which sits somewhere between the lawyer and the politician, and its sole aim is to influence political process. Figure 1.7-4 shows the money spent by U.S. lobbyist groups since 2001. Billions of dollars every year are being spent to press for political change via the lobbying industry.

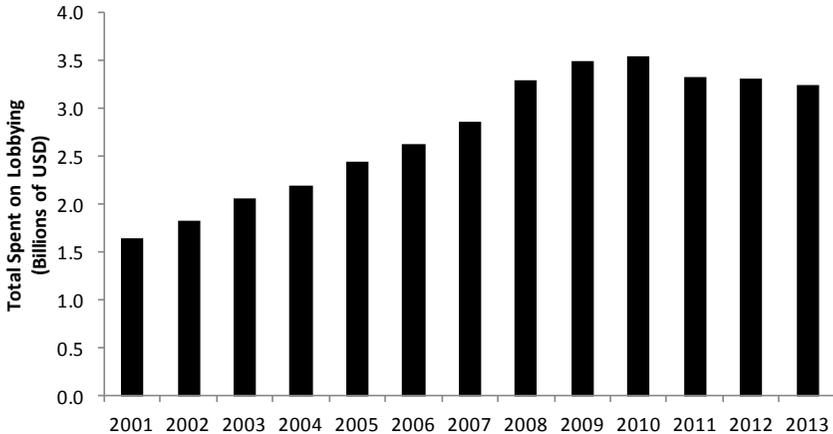


Figure 1.7-4: U.S. lobbying totals in Billions of USD (2001 - 2013) - Data taken from [9]

This is all well and good, but who is actually spending this money? Table 1.7-1 shows the top 10 lobby clients as of mid 2014. What is of note here is that the top spender, the U.S. Chamber of Commerce, is very misleadingly named. While it may appear from its moniker to be a branch of the U.S. government, it is in fact a wholly independent federation of privately run businesses. Elsewhere, big spenders include large medical, pharmaceutical, real estate and technology firms.

Lobbying Client	Total
US Chamber of Commerce	\$ 54,370,000
National Association of Realtors	\$ 23,644,253
Blue Cross / Blue Shield	\$ 11,278,646
American Medical Association	\$ 10,515,000
Dow Chemical	\$ 9,980,000
National Association of Broadcasters	\$ 9,930,000
American Hospital Association	\$ 9,676,937
Google Inc	\$ 9,310,000
Pharmaceutical Research of America	\$ 8,870,000
National Cable and Telecommunications Association	\$ 8,150,000

Table 1.7-1: Top Lobbying firms and spends (2014) - Data taken from [10]

What is also of interest here is that these sizeable investments into the political process by large businesses do not include campaign financing. The financial backing of politicians in the run up to elections is an entirely different kettle of fish within the American system, and it is one that has recently been augmented by the deceptively wholesome sounding 'Citizens United' as it has colloquially come to be known.

Citizens United versus the Federal Election Commission, to call it by its official title, was a case in court that reached its climax in 2010. The case overturned the limitations on private businesses in airing political communications, and making independent expenditures in the run up to an election. The irony is that this case, which loosened the restrictions on large businesses being active in the political process, was itself brought about by pressure from the lobbying group Citizens United^[11].

The effect of Citizens United has been profound. In 2012, a study by the non-profit group, Represent.US, showed that the election candidate who was backed by the most campaign donations won their respective election a staggering 91% of the time. The findings are summarised in Figure 1.7-5 and Figure 1.7-6.

But how is this process so effective? How is it that politicians are so responsive to the rich and not to the poor? The lobbying industry obviously gains a great deal of leverage over the popular vote through the tremendous amount of money it sinks into advertising and campaigning, but ultimately it is politicians who must vote on legislation. Beyond the election cycle, what influence does the lobbying industry have, and how does it ensnare politicians to support its aims?

Average Money Spent - Winning Candidates vs Losing Candidates

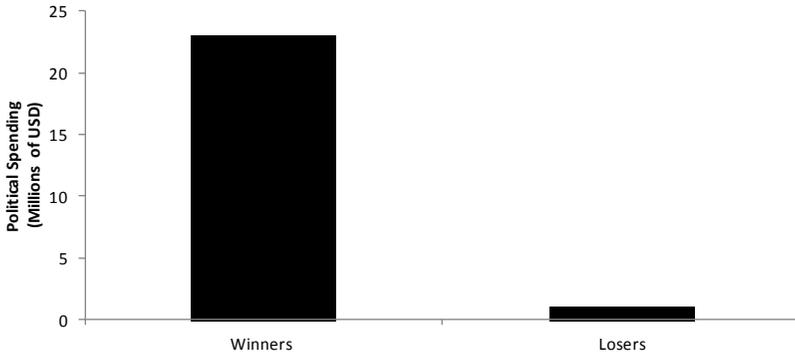


Figure 1.7-5: USA - Winning Candidates vs. Losing Candidates - Total Election spending (2012) - Data taken from [12]

Percentage of Winning Candidates Spending Less or More than their Opponent

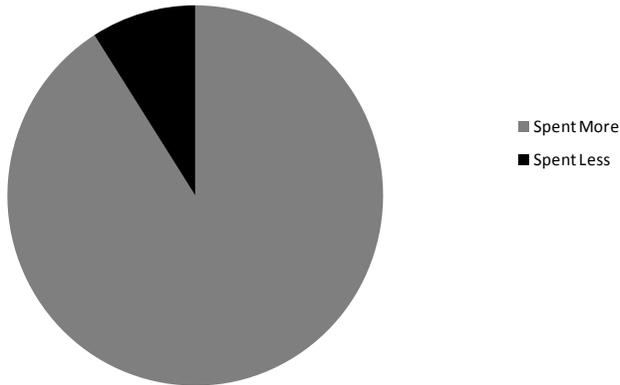


Figure 1.7-6: USA - Percentage of winning candidates based upon their spending in relation to their opponent (2012) - Note that the candidate who spent more money than their opponent won their campaign in 91% of circumstances - Data taken from [12]

The success of lobbying partially lies in its profitability. The infamous K Street thoroughfare of Washington D.C. sits just 2 miles or so away from the U.S. Capitol building, and is the spiritual home of American lobbying. Over the years, this stroll has been enjoyed by many a senator or house representative, often for reasons other than thoroughfare.

In 2012, Ivan Adler, a high ranking official in the McCormick recruitment group described his interest in the retiring members of the 112th U.S. congress; *“As a retiring class goes, this is a very valuable class. A lot of these members are marketable and will be welcomed by K Street with open arms.”*^[13]

A retired politician can command a yearly salary of up to \$1.5 million if he so chooses to make the 2 mile journey to K Street. Surely, as a member of the senate, voting upon legislation brought to the table by lobbyists, there exists a dilemma here. Does the politician build a rapport with firms, knowing that at the end of his political career, he may have an enviable salary waiting, or does he vote with his principles, and perhaps forego the ability to make a secondary living on K Street after the congress is adjourned?

Given how it is so trivially easy for wealthy businesses and individuals to legally push legislation that is to their own benefit, it is unsurprising that grass roots efforts exist to fight back against the lobbying movement. Cenk Uygur's Wolf PAC is one such movement. This group marches under the simple but uncompromising tagline of "get money out of politics", and seeks to end the legislative legacy of Citizens United and corporate personhood^[14].

Their plan to rally the individual states and overrule the bought federal government is at least realistic as to the extent of Washington corruption, but as we will peruse later in the chapter, I fear that the intractability of corporate-political fusion is something that is not fully understood on a historic and conceptual level.

"It's Just Corruption"

There are of course those who will claim that a government bending its knee to the influence of market forces is simply the action of 'bad apples' within the whole, and is indicative of a departure from the intended function of government and market respectively. This view is however fundamentally naive and reductive when confronting the wider context in which corruption occurs.

As we have seen in chapters 1.2 and 1.3, the marketplace shapes the cultural landscape in order to encourage behaviours beneficial to those markets. Citizens

are therefore conditioned to chase acquisitory and materialistic aims, such that the marketplace can maintain a stable consumption cycle. But cyclic waged labour is a paradigm which extends beyond the private, for-profit production of goods and services. The employees of public institutions are similarly tethered to the income provided to them by their career. Similarly, these public employees are also enmeshed within the wider culture of consumerism required to maintain market turnover.

The public institution must therefore be viewed, not as a distinct and independent entity which interacts exogenously with private business, but instead as an institution which is built from ordinary citizens, and lies within the cultural landscape of the society. In a society which is so heavily skewed by the influence of advertising and market forces, the public institution too becomes skewed towards the same aims.

The politicians who succumb to the pressure placed upon them by lobbying groups, or who are led astray by the prospect of personal financial gain are therefore not examples of aberrant corruption; instead they are simply expressing the cultural prerogatives that are imprinted upon them by the society they exist within. If anything, the aberrant behaviour in this scenario is the politician who does not engage in the culture, and resists based upon their moral principles, as these individuals are actively going against the conditioning placed upon them by the wider society.

This abstraction may continue to a much more general level when considering the governmental culture at an international level. Competition between nation states is infrequently based upon vague descriptive measures, such as well-being or quality of life. Instead rankings are commonly based upon the performance of the nations markets as described by GDP.

The activity of passing legislation which is to the betterment of business, but at the expense of the general population, can therefore, within the lens of governmental culture, be viewed as a positive action, not a corrupt practise. Bettering the prospect of large business within a nation will lead to better prospects for the GDP of that nation, and a more influential presence on the world stage. Therefore is the action of the business appeasing politician not patriotic? One could certainly make a convincing argument.

So if collusion between business and state is so conceptually intractable then why have things improved over time? As per the analysis of chapter 1.1, we cannot ignore the fact that citizens of the rich Western states observe a greater

level of comfort and peace than any prior point in history. If government is inherently interlinked with business, then why are citizens granted greater freedoms today than in the past?

The answer to this can be viewed beautifully through the lens of Ferguson's investment theory of politics. As briefly discussed, Ferguson's theory revolves around the realignment of political party lines based upon a change in the dominant business models of the age. Historically, the industrial revolution was built by what could be called 'labour intensive' business; heavy engineering, manufacturing and construction, which required the muscle power of swathes of manual workers. It is only natural that under the circumstances where huge amounts of unskilled labour is needed to safeguard the competitiveness of business, governmental policy would reflect a disinterest in worker rights.

This business model has however been weathered over the decades and centuries by two important trends; technology, and more recently the rise of banking. As we have seen from chapter 1.4, the acceleration of technology reduces dependency upon unskilled human labour. This ongoing progression constitutes in many ways a realignment to a new, more capital intensive business, which is less reliant upon a subjugated, unskilled workforce, and more reliant upon a bespoke, specialist workforce.

Therefore, as elaborated upon at great length by Ferguson, the idea that the rights of the population have improved over time is fully explainable through investment theory, simply by considering the ongoing realignment to more capital intensive business models. These business models are wholly ambivalent to the concept of citizen's rights, and therefore, so long as they see a return on their political investments (by advantageous legislation), they are generally disinterested with the trivialities of how the working classes fare^[15].

Take for instance the now unassailable banking sector. This sector has no desire for a disorganised and oppressed underclass of workers, simply because it's primary revenue source is based upon capital speculation and lending. Therefore, the investments which these institutions put into the political sphere will revolve around reducing regulation of these primary functions. Should other legislation be brought to the table (by good natured politicians, or by the public) which betters the life of the general citizen, but ultimately does not impact the return on the political investment in any significant way, then it will not be opposed.

In fact, such pleasing policies for the general populace should be expected as realignment to capital intensive industry occurs. Political parties can use such legislation in order to secure the valuable working class vote and increase their likelihood of seeing victory in elections. As long as promises to the investing businesses are satisfied, then the party may gladly do whatever else it wishes to maintain some semblance of ideological consistency.

Democracy for the Orwellian

The investment theory of political competition no doubt shows the fusion of government and corporate institutions at a conceptual level, but how does this process manifest in reality? Large, Western nations must maintain at least some facade of democratic accountability in order to placate the populace, so how can investments from the business world translate themselves into policy that is often to the detriment of the average voter?

In 2011, when Zucotti Park became host to the Occupy Wall Street movement, we were greeted with a fine lesson in how public opinion in a democratic society can be swayed in order to support the established business interests of the day. Occupy Wall Street was perhaps a near perfect demonstration piece for this, as it constituted a fairly genuine grassroots protest, and was directed at a series of institutions that fairly accurately represent the oligopoly described in the previous chapter.

Whether you personally agree with the aims of the movement or not is beside the point; instead what is important is that Occupy targeted an incredibly unpopular nexus of power in America. A 2014 study showed that a staggering 71% of American citizens believed that large banking institutions were at fault for the financial crisis, and still had not suffered sufficient consequences^[16]. Despite this incredible anger at Wall Street for its perceived role in the financial crisis of 2008, the movement that rose up to protest it saw approval ratings which peaked at a meagre 29% and declined rapidly as the protest matured. This is shown in Figure 1.7-7.

Why would this be the case? It is of course possible that the American public were put off by the aesthetic of the movement, or the actions of individuals within its mass, but a far more compelling view emerges when we peruse the viewership of established media sources.



Figure 1.7-7: Level of public support for the Occupy Wall Street movement - Adapted by author from [17]

Figure 1.7-8 shows a breakdown of the top American news providers. Viewers who regularly obtain their news from each source were quizzed about their knowledge of the Occupy movement's aims, and their general approval with these aims.

What is staggering here is that Fox News, which at the time of the protests was far and away the most viewed primetime news channel (see Figure 1.7-9), leaves its audience as the least knowledgeable about the movement, but also the most hostile towards its aims. The other major news networks (MSNBC and CNN) perform better, but still leave their audience only able to answer around 70% of the most basic questions about the movement's aims*.

The close ties between Fox News, the American Republican party and other big business is well trodden and does not require much in the way of elaboration. More pertinent to this chapter is why news institutions which leave people less informed about reality exist in the first place. The key is to retain the facade of democracy alluded to earlier.

* More generally, various studies have found that some news sources result in their audience knowing less about, or being more misinformed on issues than those who do not watch news at all^[83]

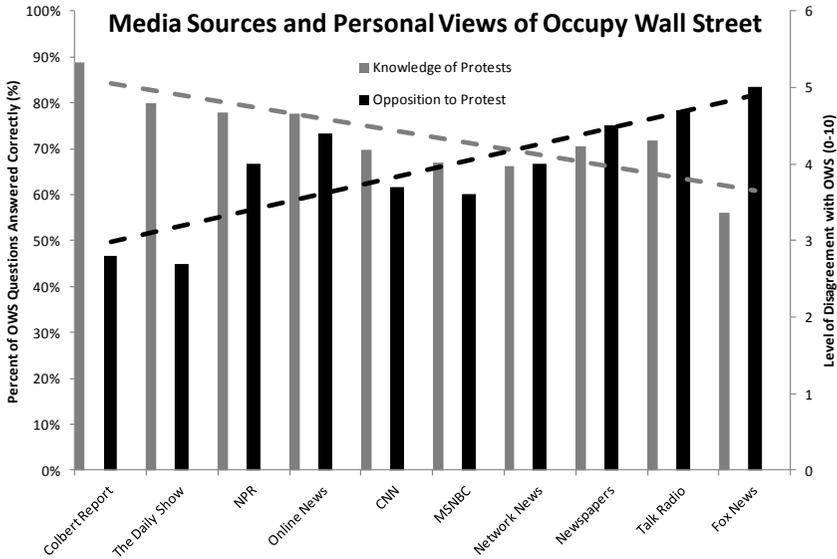


Figure 1.7-8: Correlation of OWS knowledge vs. OWS support as distributed across consumers of various news sources. Note that typically, news sources which did not properly endow knowledge of the movement in their audience, generated an audience that was more hostile towards the movement - Adapted by author from [18]

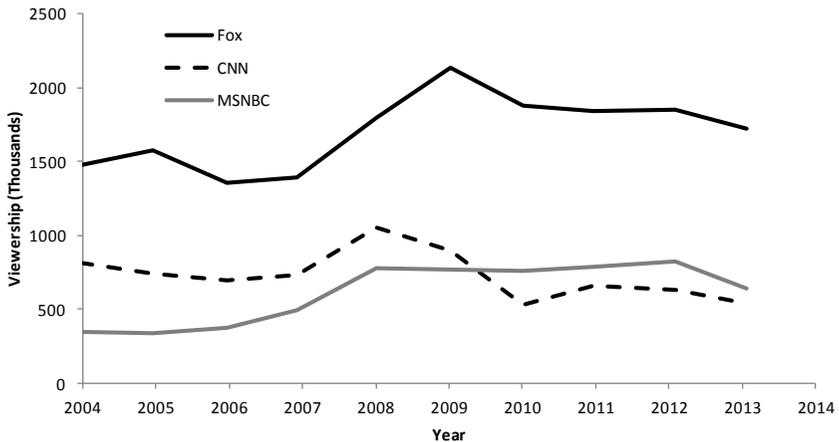


Figure 1.7-9: Top prime time news sources in USA - Data taken from [19]

Some political interaction by the populace is inevitable in a modern, Western nation, therefore it is important to the investors in the political system to safeguard their investments by any means possible. A far reaching media institution, which peddles useful half truths to the population is therefore a very powerful ally if it is oriented towards the same ends.

Nowhere is this investment safeguarding better demonstrated than in the prolific Koch household, home to billionaire industrialist brothers Charles and David, two of the most seasoned political investors of the modern age. In 2014, the Kochs enlisted at least 15 Fox News hosts and contributors to speak on behalf of their political organisation, Americans for Prosperity. These same hosts would also speak favourably of the Kochs, and the political aims of their organisations on Fox News broadcasts^[20]. In the 2012 election campaign the Kochs also invested upwards of \$400 million of known donations through their various political organisations^[21].

Rest assured that this is not a personal tirade against Charles and David Koch, as they are only differentiable from other political investors in their scale. The point of the matter is that not only do individuals and businesses invest in the political system directly, but also indirectly into media in order to alter the perceptions of the population, further lending gravity to their push for beneficial legislation.

As we have seen, the effect of media on the population's knowledge of, and opinion toward a certain topic is profound. The collusion between privately owned industry and privately owned media is therefore a damaging factor in the democratic process, as it ensures that some proportion of the electorate votes based upon unsound and biased perceptions.

However such direct intervention from the wealthy is just one facet of the fusion between powerful business interests and media. The phenomenon is reinforced by the necessity that most dominant mass-media outlets are large firms which are run for profit. Therefore they must cater to the financial interests of their shareholders or parent corporations.

The choice of which news stories to pursue and which to ignore becomes a function of profitability, rather than social benefit. Therefore news outlets can choose not to cover important stories that may have far reaching but potentially negative ramifications, instead choosing to cover stories that attract a large audience, but are ultimately trivial, for instance celebrity based stories.

Further indirect influence is taken onboard through advertising. A significant proportion of the revenue of many major media outlets derives from paid advertising. Media outlets become substantially less commercially viable without the support of large advertisers. News media must therefore cater to any political and economic prejudices of their advertisers in order to retain a revenue stream.

The circularity of media in society becomes complete when media forges close links with political parties. As Fox News so readily demonstrates, its parent, News Corporation donates large sums of money to both major American parties. In *Manufacturing Consent*, by Edward Herman and Noam Chomsky, the argument is put forth that the state political institutions partially subsidise mass media by reducing the media's costs of acquiring and producing news content.

This may come about by offering special insider access rights to large media companies for coverage of political stories or events. In turn, the political institutions become 'routine' news sources and gain a privileged access status to the media. Non-routine, non-establishment sources may therefore struggle for access, and may be ignored by the arbitrary decisions of the media firms. Furthermore, establishment sources may penalise or limit the access rights of large media companies if they are seen to be too critical, or too dissenting to their actions^[22].

The result is a confusing, blurred line between government and private enterprise, as a political party relies upon a private media outlet to gain favour amongst the electorate, while political investors from industry pour money into both to further their ideals. The media firm (or its individual contributors) receive funding for voicing the opinions of their donors, the political party receives funding from the same donors, and positive propaganda from the media, while the investors gain both public and political support for their desired policies. In turn, the media receives special access rights to news, contingent upon them upholding the general establishment narratives of the current political orthodoxy.

A glimpse into the formal communication behind this collusion is perfectly illustrated through the leaked emails of the lobbying firm Clark, Lytle, Geduldig & Cranford. In an email dated November 24th 2011 and addressed to the American Bankers Association, the group warns of the threats of Occupy Wall Street to banking sector firms.

"This would mean more than just short term political discomfort for Wall Street firms. If vilifying the leading companies of this sector is allowed to become an unchallenged centerpiece of a coordinated Democratic campaign, it has the potential to have very long-lasting political, policy and financial impacts on the companies in the center of the bullseye."^[23]

The email goes on to discuss methods of research into the movement, including monitoring of members of the movement on social media, and the proposal for creation of TV and radio media to rally support against the movement^[23].

This crossover of establishment party politics into media manifests itself in some strange, almost Orwellian doublespeak emerging simultaneously from political institutions and media outlets. Frank Luntz is a Republican party strategist and spin doctor who was particularly uneasy about the message of Occupy Wall Street: *"I'm so scared of this anti-Wall Street effort. I'm frightened to death... They're having an impact on what the American people think of capitalism."*^[24]

In order to weather the storm of criticism at the oligarchic practises of Wall Street et al, Luntz was responsible for crafting numerous idioms of linguistic gymnastics, which his party was to follow in order to muddy the discussion. Amongst these, 'tax the rich.' was replaced with the more loaded 'take from the rich'; 'middle class' was substituted with 'hardworking taxpayers' and usage of the word 'capitalism' was sternly advised against^[25].

Elsewhere, media establishments framed the situation using scarily similar semantic tricks. Most notably, the abstract term 'job creator' was used in place of any institution or individual considered to be part of the business class of political investors*. Like the political spin of Luntz, these networks shied away from usage of the word 'rich' in favour of this more loaded term. This phrase in particular set the issue as a matter of morals rather than economics, in which the working classes were beguiled into accepting a narrative which held the wealthy as the unsung heroes, rather than those popularly considered to be culpable for the situation.

But the American scene is just one of many when considering the verbose and skewed lexicon of political discourse. The fusion of British media with politics and big business has led to a similar alternative perceived reality within the population. Britons on average wildly overestimate the amount of immigrants in

* More information on the use of 'job creator' is included in [84]

their country, the number of unemployed, the number of teen pregnancies and the number of single parent households. In addition to this, the public also grossly overestimates the amount of state expenditure on welfare, the amount of welfare fraud, and the percentage of long term unemployed. This is shown in Figure 1.7-10 and Figure 1.7-11.

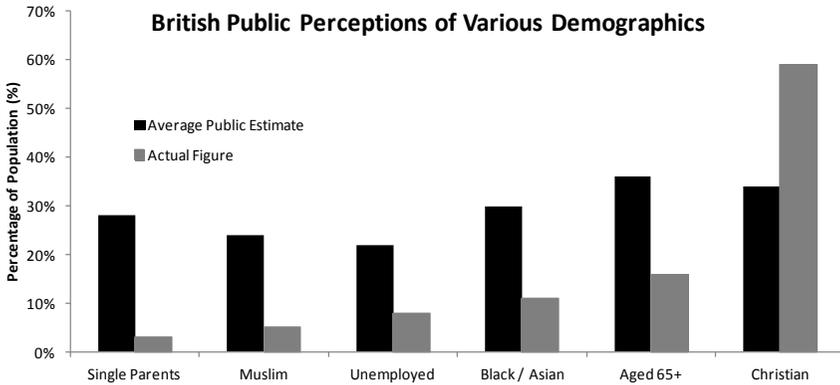


Figure 1.7-10: Perceptions of the British public vs. actual statistics - various demographics - Adapted by author from [26]

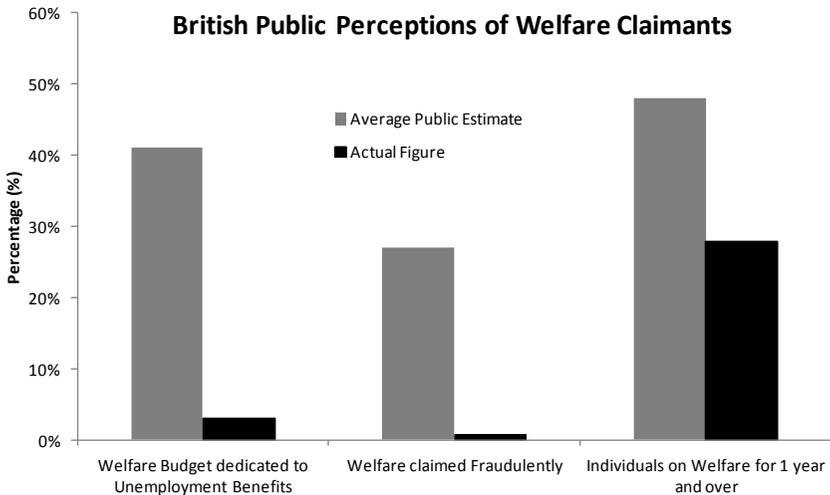


Figure 1.7-11: Perceptions of the British public vs. actual statistics - Welfare figures - Adapted by author from [27]

Why would the British public believe things that are so outlandishly untrue? The answer to this again is a coordinated effort by media, political parties and industrial investors to mutually create legislation for their own benefit. As with the American process, wealthy individuals are privy to conversation with high ranking cabinet members in the government. While the American process involves the conduit of the lobbyist, British magnates frequently interface directly with the political sphere through widely reported 'dining clubs' and other similar events. One such of the elite dining clubs is estimated to have funnelled over £43million into the Conservative party alone^[28].

Such clubs are frequented by the likes of venture capitalist, Adrian Beecroft, who donated £750,000 to the Conservative party through dinners with the Prime Minister^[29]. In 2012, close aides to the Prime Minister were unsurprisingly considering legislation proposed through the so called '*Beecroft Report*', which would have allowed employers to bring back a default retirement age, cut redundancy notice periods, have worker payouts at tribunals capped, and bring in cheap migrant labour without having to advertise within the UK first - an effective repeal of decades' worth of employee protections^[30].

So why, in the midst of such bare faced political skew towards the demands of the wealthy, do the public turn their anger so disproportionately toward immigrants and the unemployed? Kathleen Hall Jamieson, an expert in political communication who directs the Annenberg Public Policy Center at the University of Pennsylvania, is well versed in this method of political distraction:

“Under these circumstances, you have victims and you need to find a villain... We need a narrative explanation that tells us how we got here, and attaches blame... There has to be a sense of good and evil; a dramatic arc to it that makes some intuitive sense, so it can't be terribly complex.”^[31]

Hardline political investors such as Beecroft have a pronounced interest in escaping the tag of the 'villain' in this context, as much as the politicians who are eager to avoid the label of corruption. Distracting and demagogic narratives are therefore developed to deflect the rage of the 'victims' (in this case, the general public) onto a simple, evil foe that can easily be scapegoated.

The British model of distraction is as simple as Jamieson suggests. Governmental officials use loaded language such as 'strivers vs. shirkers'^[32] in order to place blame for financial turmoil on lazy unemployed people. Private media outlets such as Channel 4, reinforce the public sway by airing popular

television documentaries such as *'Benefits Street'*, which creates an unflattering parody of the unemployed.

A secondary prong comes in the form of the fringe-cum-establishment party UKIP, which places blame for the country's woes squarely on the immigrant, and the European Union. Despite the fact that UKIP remains a very small force with the same number of parliamentary seats as the Green Party, they have earned a place within the pantheon of media acceptance, earning a record number of appearances on news broadcasts, and a formal invitation to debate alongside the three major UK parties^[33].

So why does this party merit such disproportionate coverage, while similar sized parties wallow in relative obscurity? The simple fact of the matter is that the narrative put forth by UKIP is much more compatible with the existing establishment norms.

The more obscure Green Party is far more critical of large business, banking and climate deteriorating energy policy, therefore despite a majority of the public supporting Green Party policies when trialled blindly^[34], the vaguely anti-establishment narrative of the party precludes any serious coverage from large media. UKIP however are attractive from the perspective of political investment because their manifesto is skewed towards distractive policies that do not readily critique the oligarchy, instead falling upon immigration and patriotism.

The result of this media complicity is a population that is constantly exposed to discourse which blames social ills on distractive issues or scapegoated minorities. It is therefore thoroughly unsurprising that the British public places such exaggerated weight on the financially trivial issue of welfare (in comparison to other government spending), and believes that immigration is massively more severe than it actually is.

This fusion of media, business and government, while successful in misleading the public, is not the most extreme case of anti-democratic action that can result from business and state colluding. In order to discuss the more direct methods that establishment institutions hold up their sleeve, we must assess the use of the justice systems within modern states.

The Function of Justice

Policing and judiciary is widely considered to be one of the cornerstones of a civil society, and exists as perhaps a strange anomaly in terms of the service it provides. The police force is the only institution within a nation state which is

granted the right to use force against the population, in a manner beyond strict self-defence. Similarly, the powers of justice within a nation are the only bodies which are permitted to revoke the freedoms of a citizen. Society generally consents to the presence of these institutions in order to counter the risks of criminal activity, violent or anti-social behaviour.

But these institutions are as fallible as any we have considered thus far, and are also exposed to the primary prerogatives of the society within which they exist. As we have seen with the political establishment, the democratic function of the institution can be undermined by investment from the business community. This influence can be demonstrated to cascade through state institutions in a fairly predictable manner, resulting in a general skew towards protection of powerful business interests, and nonchalance towards the rights of the general public.

Nowhere does the prerogative of the justice system emerge more clearly than when perusing the types of citizens which are incarcerated, versus the types which are not. One of the most outlandish examples of this skewed priority can be deduced from the wake of the subprime crisis of 2007.

In November 2011, the U.S. Treasury stated that it was conducting a civil investigation of around 4,500 dubious or potentially illegal foreclosures. A significant proportion of these foreclosures were on the property of American military personnel. Attorneys representing service members estimated that up to 30,000 military personnel were subject to illegal foreclosure^[35].

Legal institutions also weighed in upon the sprawling scale of this foreclosure scandal. Raymond Brescia, a visiting professor at Yale Law School commented that "*...it's difficult to find a fraud of this size on the U.S. court system in U.S. history, I can't think of one where you have literally tens of thousands of fraudulent documents filed in tens of thousands of cases.*"^[36]

Yet in the face of this overwhelming swathe of evidence for fraudulent behaviour on behalf of the banks, Federal law enforcement agencies have remained ominously absent. In 2010, the FBI's Las Vegas mortgage fraud task team was disbanded, despite Las Vegas being one of the hardest hit cities by the subprime crisis^[37]. Elsewhere in the United States, the conspicuous lack of any federal prosecution has led state governments to attempt investigations into the banks on their own, including New York, Massachusetts, Delaware and California^[38].

Despite the tremendous amount of state revenue that is on offer here through potential criminal fines, Federal prosecutors have turned a blind eye to the crimes of those primarily culpable for the largest financial collapse of our lifetimes.

But the skew in law enforcement agencies' attention does more than simply ignore crimes of the wealthy; it also acts to disproportionately antagonise the poor. Indeed, this trend is well trodden and has been discussed in great length. J. H. Reiman in his 1979 book, *The Rich Get Richer And The Poor Get Prison - Ideology, Class, And Criminal Justice*, wrote of an economic bias that is fundamental to the discrepancies in criminalisation at the top and bottom of society.

"The current criminal justice system is shaped by economic bias-- crimes unique to the wealthy are either ignored or treated lightly, while the so-called common crimes of the poor lead to arrest, charges, conviction, and imprisonment."^[39]

This heavy-handed focus on the poorest in society is demonstrated explicitly by the treatment of the homeless in Western nations. In a British study, *Homelessness: Exploring the New Terrain*, the criminalisation of the homeless is discussed through the activities of the London Charing Cross homeless unit; a specialist police unit based in Central London, with the sole function of dealing with homeless people.

"When one considers that the number of rough sleepers in Charing Cross rarely, if at all, exceeds 200, this means that the police-to-rough sleepers ratio in Charing Cross is remarkably low - about 1 in 30 in summer, dropping to 1 in 10 in winter. This compares with an average of one officer for every 416 people in England and Wales, and 281 for the combined Metropolitan Police District and City of London force - the area with the highest concentration of police per head of population in England and Wales. This means that during the summer months when the ratio in Charing Cross is at its highest, there are about nine times more officers policing the visible homeless in the Charing Cross area than there are officers policing the rest of the population of London [...]"

What is clear [...] is that these low ratios are not benign. On the contrary they provide the infrastructure necessary to realise a policing strategy in which rough sleepers, and people involved in activities

which are commonly associated with homelessness, such as begging and street drinking, are more at risk from becoming the objects of formal police powers [...]”^[40]

This is further supported by the fact that in Western prisons, a disproportionate amount of inmates are poor. A 2013 study by the UK based Prison Reform Trust showed that 48% of British prisoners admit to having a history of debt problems, and perhaps more staggeringly, the study found that a third of British prisoners have never had a bank account^[41]. In the USA, 50% of the state prison population in 1991 reported an annual income of less than \$10,000 prior to their arrest^[42].

But this skew of the justice system to favour the wealthy business classes over the general population is not the only connection here. The skew of who is prosecuted also extends into the political realm. A prime example of this came in 2009, when the UK Parliament was embroiled in scandal following the leak of a raft of fraudulently claimed expenses on behalf of MPs. On the face of it, this scandal was dealt with relatively cleanly, with resignation and some limited prison sentences being metered out to the worst of the offenders, but the issue is much deeper.

As far back as 2005, a freedom of information act request had been submitted by journalists to ascertain the expenses account information of the parliament; a perfectly reasonable and legal request. This request had however been subject to much smoke and mirrors, including an attempt in 2007 to retroactively change the law to prevent MPs being subject to the freedom of information act^[43].

It was only after the leaking of information that this long running scandal came to light, and forced the hand of the political establishment to cleanse itself of the 'bad apples' in order to retain any level of public accountability. This behaviour had however been endemic for years previously, and staffers who handled the data on behalf of MPs were often appalled by the claims. Yet large scale fraud continued unabated and was only finally confronted when public outrage left no other option.

This reluctance to prosecute politicians indulging in crime is nicely balanced at the other end of the spectrum, illustrated by the persecution of whistleblowers. The UK expenses scandal is perhaps somewhat of an anomaly here, as while the leaked documents contained a mammoth scale of fraud, at least some prison time was apportioned out to the criminals, even if it was the last possible course of action.

In the case of the American whistleblower, Chelsea Manning, the crimes that were revealed in the data leak went unpunished, while the crime of revealing the information was faced with immensely hard penalties. Manning suffered detainment, sleep deprivation and forced nudity at the hands of the U.S. justice system, and ultimately was convicted to 35 years in prison.

Despite this, the documents which Manning leaked revealed significant breaches of international law by the U.S. military, including unacceptably high civilian death tolls (in the Granai airstrike for example), and systematic detention and torture of prisoners without trial at Guantanamo Bay; crimes which are substantially worse than those of Manning, yet remain unpunished^[44].

However, what is particularly interesting with this case is that when Manning initially contacted mainstream media sources, such as the NY Times, there was no interest in covering the stories. It was only when Manning eventually turned to the underground website Wikileaks that the information was released^[44].

While mainstream media sources reluctantly reported the story after the leak, coverage remained minimal. What little coverage there was became focused disproportionately on the crimes of Manning himself, rather than the actual content of the leaks. Journalist Jeremy Scahill railed against this media stance on the issue as the Manning trial came to its conclusion.

"When those in power want to gin up support for a war, they know who to call in the powerful media outlets. When they want to stamp down any public awareness of an issue, they know how to make it a non-story [...] there has been more coverage of the indictment of that Real Housewives lady and her husband than there has been of Bradley Manning."^[45]

What is so intriguing about this case is how illustrative it is of how the systems of justice can act against their own principles in order to protect the interests of the state, while colluding so effectively with private media in order to shirk public accountability.

Media, eager to maintain its access rights to lucrative governmental information sources, plays its role in order to downplay stories which are uncomfortable to the state, while the systems of justice heavily penalise those who reveal unpleasant secrets, rather than those at the root of the unpleasantness. This collusion leads to perplexing situations where Manning, an instrumental whistleblower in revealing the illegality of Guantanamo Bay, languishes for

decades in prison, while Guantanamo Bay remains open with over 100 detainees.

Treatment of other Western whistleblowers has been similarly imbalanced. Wikileaks' Julian Assange currently resides within the Ecuadorian embassy in London, where he has remained for over 2 years. Over this time period, it is estimated that the London Metropolitan police have spent a staggering £6.5million on a single person, through their decision to guard the entrance to the embassy 24 hours a day to ensure Assange does not leave^[46].

Even if Assange was guilty of rape, he would be the single most doggedly pursued rapist in British, if not global history. Assange's cost to the taxpayer dwarfs even the most protracted campaigns against far more dangerous individuals. As an illustration, the universally deplored Islamic cleric, Abu Hamza had only cost the British taxpayer a conservative £2.75 million^[47], after a full 5 years of spiralling legal battles. Yet Hamza's chequered past of terrorist training arguably offered a far more convincing threat to the safety of the public when compared to an Australian journalist accused of sexual assault.

The case of Edward Snowden too saw disproportionate efforts and costs put forth in his pursuit by the U.S. and its allies. The most absurd and audacious of these occurred when the private jet of Bolivian president Evo Morales was denied airspace access rights over a collection of Western European states, due to a belief that Snowden was onboard^[48].

In order to subscribe to the belief that state justice systems exist in order to protect the public, one must begrudgingly concede that the likes of Assange, Snowden or Manning are amongst the most dangerous people in the world. Why else would such extraordinary efforts be made to detain them? Why would a presidential flight be grounded and subject to an unprecedented search if Snowden was not the greatest possible threat to peaceful citizens? Why would British police keep up a perpetual vigil for two straight years if Assange was not a dire threat to the people of London?

The answer to this is of course obvious; these men are guilty of crimes against the political and industrial establishment. The systems of justice must therefore act to protect the establishment and its business backers by pursuing the threat by any means necessary. Painful irony is brought forth in many of these cases due to the fact that much of the material leaked by these whistleblowers revealed far more dangerous issues.

War is a Racket

State sanctioned violence however extends beyond the police forces and the wider system of justice. The complex function of war within a state based market economy is one which is tremendously important, both in terms of geopolitical relations between states and corporate profitability.

With the Iraq war still raw within memory, it seems prudent to explore this conflict in the context of state and corporate fusion. This war is also particularly rich in its literature describing the ulterior motives of nation states and corporate interests.

From its origins in the wake of September the 11th, few were more vocal in their support for the war in Iraq than Dick Cheney, then vice-president to George W. Bush. It was Cheney who was among the first to speak in public about the threat that the Iraqi Baathist regime posed toward the United States, with the now infamous weapons of mass destruction they supposedly wielded.

Yet in the wake of the war, it became clear that none had benefited more from the conflict than KBR, the controversial former subsidiary of the infrastructure giant, Halliburton. This defence contracting firm, perhaps unsurprisingly, had hired Dick Cheney as CEO in 1995. This appointment occurred after Cheney, in his previous position as U.S. defence secretary, had handed the subsidiary \$8.5 million to study the use of private military forces, at the conclusion of Operation Desert Storm some four years earlier^[49].

The links between Cheney and KBR became more entangled when it was discovered that the firm went on to be awarded at least \$39.5 billion in federal contracts related to the Iraq war over the first decade of conflict^[49].

However these potentially nefarious motives are nothing new, nor are they particularly obscure in historic literature. The fantastically named Major General Smedley Butler published his now famous polemic, *War is a Racket*, in the tender year of 1935, a full four years before the world plunged into global conflict with Adolf Hitler's Nazi regime. The opening diatribe of this work is as scathing today as it was in the post WWI landscape, and is therefore irresistible to quote in full presently:

"War is a racket. It always has been. It is possibly the oldest, easily the most profitable, surely the most vicious. It is the only one international in scope. It is the only one in which the profits are reckoned in dollars and the losses in lives. A racket is best described, I believe, as

something that is not what it seems to the majority of the people. Only a small 'inside' group knows what it is about. It is conducted for the benefit of the very few, at the expense of the very many. Out of war a few people make huge fortunes."^[50]

But informal ranting is the least that General Butler put on offer in *War is a Racket*. Also included is an exhaustive list of American corporations who profited greatly in the height of The Great War, a small subset of which is presented in Table 1.7-2.

Company	Average Annual Profit	
	Pre War Period	War Years
DuPonts	\$6 million	\$58 million
Bethlehem Steel	\$6 million	\$49 million
Utah Copper	\$5 million	\$21 million
International Nickel	\$4 million	\$73.5 million

Table 1.7-2: Average annual profits of large American corporations, pre WWI and during WWI - Adapted by author from [51]

The above companies are however just a small collection of those that saw vastly increased profits during The Great War. Manufacturers of everything from leather boots to mosquito nets saw sales of their products soar due to the campaign in Europe and the Pacific. Butler continues in his unique style:

"The normal profits of a business concern in the United States are six, eight, ten and sometimes twelve percent. But wartime profits - ah! that is another matter - twenty, sixty, one hundred, three hundred and even eighteen hundred percent - the sky is the limit. All that the traffic will bear. Uncle Sam has the money. Let's get it.

Of course, it isn't put that crudely in wartime. It is dressed into speeches about patriotism, love of country, and "we must put our shoulder to the wheel," but the profits jump and leap and skyrocket - and are safely pocketed."^[52]

The exploits of yesteryear's heavy manufacturers however are safe today under the watchful eye of the nebulous defence contractor. A 2011 report from the commission on Wartime Contracting in Iraq and Afghanistan estimated that defence contracting firms had either wasted or defrauded as much as \$60billion, approximately \$12million every day for the decade spanning from 2001 to 2011^[53].

Despite the gargantuan amount of money that has disappeared, and the numerous cases of wrongdoing, the largest of these defence contractors (Blackwater, now Academi) was only prosecuted to the tune of \$7.5 million in fines*, which it paid to the U.S. federal government without admitting fault. This came despite the fact that in 2007, a high level manager of the Blackwater group had personally threatened to murder a U.S. special agent investigator named Jean Richter^[55].

This lax accountability gives the impression that Academi operated in Iraq and Afghanistan seemingly above the law, and indeed it should. In 2011, the board of directors at Academi consisted of - among others - John Ashcroft, former U.S. Attorney General for the Bush Administration and founder of The Ashcroft Group, a Washington D.C. lobbying company. Alongside him sat Jack Quinn, former Chief of Staff to the Vice President of the United States during the Clinton administration^[56].

Such intermingling of esteemed and influential politicians with for-profit contracting companies is not necessarily a conclusive proof of collusion, but when considering the sheer amount of money that has been provided to the group through government contracts, and the absence of any large scale prosecution of the group, the picture becomes clearer.

There are of course a surplus of similar examples of vested interest between government and corporation against the backdrop of war, but brevity dictates that these are best left to the reader's own research. The crux of the matter here is the overarching trend of market and state is to collude, and to spend consistently vast amounts of money on warfare.

This line of action has been afforded many monikers through history; from the 'permanent war economy' coined in 1944 by Ed Sard^[57], to the more neutral 'military Keynesianism', in which the Keynesian ideal of spending government money on large scale infrastructure is instead funnelled into large scale military projects^[58]. The theoretical argument behind this is that the spending offers a convoluted boost to economic growth, a continually ramped up industry and a high employment rate.

Now, the economic reasoning as to the link between growth and spending are obviously deeply flawed here, for reasons which we will cover in chapter 1.13,

* *Aside from an additional and separate \$42 million fine relating to unlawful provision of armaments overseas*^[54]

but suppose we continue this line of argument within the scope of economic theory. If government spending in a Keynesian manner is such a powerful impetus, why then would vast social projects which benefit the people not be prioritised ahead of large military infrastructure? Noam Chomsky offers a hypothesis for why this may be the case:

"Social spending may well arouse public interest and participation, thus enhancing the threat of democracy; the public cares about hospitals, roads, neighborhoods, and so on, but has no opinion about the choice of missiles and high-tech fighter planes."^[59]

Furthermore, keeping Ferguson's investment theory in mind, we would be in better stead to understand this prerogative by perusing the wishes of the rich and powerful. In a speech at the Twenty-Fifth Anniversary Dinner of the Army Ordnance Association on January 19, 1944, the CEO of General Electric and vice-chairman of the War Production Board, Charles Edward Wilson argued for the continuation of large scale military spending beyond the end of the Second World War. He argued for an institutionalized war economy which was to be directed by corporate executives, based on military industry, and funded by government money^[60].

In the context of Wilson's speech, he supported this plan on the basis of maintaining a strong America to weather the uncertain times ahead, and this view may indeed have held some weight. However, there is a clear conflict of interest here, as the truth of the matter is that General Electric had profited massively from the war effort, and in many ways to the USA's detriment.

Just three years later, General Electric found itself in court on counts of collusion with the Nazi steel manufacturer Krupp, over price fixing Tungsten Carbide, in some cases at prices almost 10 times the market value. In light of this, it seems clear that arguing for an economy which continued the spending trends that were present in wartime would significantly benefit General Electric, irrespective of the greater geopolitical reasoning that Wilson put forward^[61].

This benefit to corporate interests through bloated military budgets is brought to a head by the revolving door relationship between business and government. As illustrated by the KBR/Halliburton example which we have already perused, many of the businessmen who reap the rewards of defence contracts are the very same politicians who are responsible for contracting the work in the first place (or at the very least influential in the process). The fusion between government and business in this case is about as pure as can be illustrated.

This behaviour, unsurprisingly is anathema to statist and free market fundamentalists alike, and so it should be. However the institution of war is so tightly wrapped in jingo and pomp that hard criticism is difficult to meter out. The media, as with any other issue, also leaps into the fray in order to retain its credibility, its access rights to government, and its favour with big business investors.

The inherent entanglement of war with patriotism, nationalism and fables of valour instils a powerful taboo around critical discussion. This taboo is further exacerbated wherever possible by the media, in order to drum up an illusion of support for the war of the day, regardless of whether the public is generally opposed to it.

In 2012, during the tail end of the USA's conflicts in the middle east, MSNBC journalist Chris Hayes attracted tremendous public criticism when, during a TV appearance, he explained being 'uncomfortable' with blanket use of the word "heroes" when referring to soldiers:

"I think it's interesting because I think it is very difficult to talk about the war dead and the fallen without invoking valor, without invoking the words "heroes." Why do I feel so [uncomfortable] about the word "hero"? I feel [...] uncomfortable -- about the word because it seems to me that it is so rhetorically proximate to justifications for more war... I don't want to obviously desecrate or disrespect the memory of anyone that's fallen, and obviously there are individual circumstances in which there is genuine, tremendous heroism: hails of gunfire, rescuing fellow soldiers and things like that. But it seems to me that we marshal this word in a way that is problematic. But maybe I'm wrong about that."^[62]

The very next day, Hayes was forced to issue a three paragraph long statement, where he unreservedly apologised for the above opinion, despite its benign and measured nature^[63]. But this backlash is entirely indicative of the narrative that Wilson's war economy requires in order to function.

An environment where soldiers are viewed as heroes implicitly infers positive connotations on their deeds. Even if the public stridently oppose the war, they do not stridently oppose the efforts of the young men and women who lay down their lives in service. Through this tact, military institutions can be given a human face, and disagreement can be muted.

The human face of the soldier can not only be used to invoke support for the ongoing war, but also for the actual monetary spending which keeps the war economy afloat. During the early stages of the Iraq conflict, the British military was portrayed as bravely soldiering forward despite poor equipment, faulty vehicles and unsuitable clothing^[64].

By the end of the conflict, over £6 billion had been spent in order to improve British soldiers' equipment, as well as 325 new Foxhound armoured vehicles at a cost of £300 million^[65]. Despite these astronomical sums of money all going directly to the pockets of private companies, and all of this spending being in addition to the £34 billion annual budget of the UK Ministry of Defence, the UK public remained sanguine on the matter, while some even welcomed the spending as a worthy cause to support the brave soldiers.

Consider this indifference in the media over such spending when set against the fervour of the comparatively miniscule amount spent upon unemployment benefits. The priority is clear. By portraying war spending in terms of the individual soldier, enormous amounts of taxpayer money can be funnelled to private interests without public ire.

There are of course a wealth of further entanglements between military institutions, business, government and media, unquestionably more than can be contained within this chapter. What is of greater importance here is the overall phenomenon. The politician, the business executive and the media chief editor are all led by the same individualist, profit maximising behaviour that the market is built upon. War, in this respect, despite arguably being our most violent creation, is as banal in its functionality as any other market phenomenon.

The Crackdown on Emerging Business Models

The state's investment in military corporations is largely indistinguishable from investment in other corporate sectors. Investment into corporations is however just one side of the coin. We must also consider the manner in which the state shields such corporations from competition. To understand this behaviour, an illustrative example seems pertinent.

The year is 1982. Jack Valenti, esteemed lobbyist for the Motion Picture Association of America (MPAA) stands to testify in front of a U.S. House Judiciary Subcommittee.

"I say to you that the VCR is to the American film producer and the American public as the Boston strangler is to the woman home alone."^[66]

Valenti presented his argument that the humble video recorder would brutally murder the American film industry, by allowing the public to record television broadcasts on demand, thus essentially enabling free duplication of copyrighted material. But this was not the first testimony that would be made against the humble Sony Betamax tape recorder, nor the last.

The trail of litigation brought through the courts by the MPAA stretched as far back as 1976, and would go on until their ultimate loss in the Supreme Court in 1984. Immediately after this loss, the film industry lobbied Congress to pass various pieces of legislation to protect them from the effects of home recording.

However, the use of home recording devices had become so widespread in the eight year long span of the lawsuit, that Congress was not prepared to take retrospective, draconian action. The film industry further lobbied Congress to impose a royalty fee on the sale of blank videotapes, but Congress too refused this, on the grounds that the industry had already profited from the technology through the sale of home video tapes^[67].

This behaviour may seem relatively banal, and unrelated to the topic of governmental and business fusion, but the motivations behind the 'Betamax case' are fundamental and exemplary to the broader content of this chapter.

Within a marketplace, Schumpeterian Creative Destruction overturns the established leviathans of old in order to bring forth new products and services that offer greater social benefit - or at least, that is how the economic parable goes. As we have seen in the previous chapter, this force may act approximately in the manner that Schumpeter described at a product level, but it does not necessarily preclude oligopoly or monopoly. Betamax versus the film industry is a classic example of creative destruction in action, whereby a game changing technology emerges, and eclipses the validity of extant, established business models.

However, this becomes pertinent to the topic of governmental and business collusion when we consider what the 'overthrown' business does in response to this creative destruction. In the free market worldview, the defeated business is faced with a choice; either to stick to its outdated business model and face 'destruction', or to forge a new business model and survive. However with the

presence of a powerful state, there is a third option. As with the film industry, who saw their business model under threat, a company may appeal to the courts, or lobby the political powers that be, in order to help fend off the emerging business model and thus maintain their own.

This approach is well trodden both historically, and in modern discourse. In one of the more absurd examples, luxury electric car manufacturer Tesla is specifically and exclusively banned from selling cars in the U.S. state of Texas. The company currently operates two Tesla showrooms in Houston and Austin, at which employees are legally forbidden from discussing pricing, financing, leasing, reservation or purchasing options. The showrooms are also unable to offer test drives or refer the customer to other stores out of state^[68]. What is the reason for this uncharacteristically precise legislation?

The Texas Automobile Dealers Association has invested over a quarter of a million dollars into the state legislature, because Tesla does not sell through a traditional car dealership^[69]. To buy a Tesla car, the customer buys directly from Tesla. This business model is at odds with the business model of the car dealership, which acts as a middleman between the manufacturer and customer.

The investment into the state legislature by the Dealer's Association lobby therefore is a sound decision, as it pays for a legal framework to be developed, whereby their business model is the only sanctioned approach - a tremendous competitive advantage. Texas is however not alone in this tact, with North Carolina, New York, Minnesota and Virginia all toying with similar bills.

Tesla however is a particularly maligned company when it comes to its competitors colluding against them. In a New York Times article, journalist John Broder reviewed a Tesla motor car by driving a route down the U.S. East Coast. The piece was scathing to the automobile manufacturer and claimed that the car did not possess adequate range, resulting in the test drive being aborted, and the car being towed the remainder of the journey^[70].

However, data from the car logs indicate that Broder had exhibited some unusual behaviour while driving the car, including driving past several charge points, breaking the speed limits, not charging the car fully, maintaining the cabin temperature at an uncomfortably high level, and even driving in circles around a car park for over half a mile^[71].

Despite a keen desire to debunk the claims of his detractors, Tesla CEO Elon Musk remains relatively sanguine about the efforts against his brand, and

compares them to "... 'big tobacco' in the old days, and how they'd run all these ads about how tobacco's no problem."^[72] But this trend is just part of a larger picture. The New York Times is a media establishment which must reflect the interests of its backers and investors. It too must therefore play its part against the business models which threaten to overhaul the marketplace in a Schumpeterian fashion.

Clean energy firms are equally besmirched by this method, as best illustrated by the June 2014 letter from the Koch brothers' Americans for Prosperity, to the U.S. government urging against the subsidy of wind energy companies. The letter includes 60 organizations that are unsurprisingly either funded by fossil-fuel energy interests, such as Koch Industries, ExxonMobil, and the American Petroleum Institute, or have known ties to the Koch brothers' personal lobbying and political action groups, such as Policy Network and the American Legislative Exchange Council^[73].

As environmentally focused as the examples presented above are, we must note that this is not an anti-environmentalist phenomenon in exclusivity. This crackdown on emerging business models by the established powers of government, media and traditional business can be brought to bear against any business that is presenting something new or challenging in its business model. For this reason, free-market advocates and libertarians take particular umbrage towards the quashing of emerging business by the powers that be. The following subsection of this chapter will discuss why this line of argument, while good natured, is ultimately flawed.

'Cronyism' and the Free-Market Rejoinder

Of the more frustrating labels given to social models, 'crony-capitalism' ranks highly in my mind. Within a 'crony' capitalist economy, a powerful state component grants special privileges to certain business interests by way of tax breaks, grants, government contracts or otherwise, thus dampening the dynamism of capitalism, inhibiting creative destruction, and aiding in the establishment of long running oligopoly which spans the business and governmental spheres.

The objection here is specifically to the prefix of 'crony', which implicitly suggests that the collusion of powerful institutions is some aberration of capitalism, and is an avoidable deviation from the free market. Furthermore, it implies that the solution to the issue is more market freedom, which will chip away the capacity for cronies to engage in anti-competitive behaviour. This is incorrect primarily due to two overarching flaws in the logic.

Firstly, much to the dismay of free market proponents, complete unfettered free market capitalism remains a strictly theoretical proposition. As we have discussed in the opening chapter, the distinction as to what a free market actually is, and what a market is permitted to be responsible for, remains a totally subjective topic of conversation. Historically, mixed economies, in which market and state exist side by side, have been the only game in town.

Proponents of the free market typically view the situation differently, and look on the state as an aberrant creation that stands impudently separate from the natural, spontaneous market. This view is at best superficial, as history shows that the concepts of free markets and the state as an institution are highly intertwined.

The concept of the Westphalian sovereignty of 1648 underpins the modern idea of the nation-state as we know today, and the subsequent global alignment of newly forming states with this European example followed suit. During this phase of state formation, European nations largely followed an economic philosophy of proto-capitalism which became known as 'mercantilism'. Mercantilism focused upon stringent government control over a staunchly protectionist economy, in which merchants were encouraged to trade on behalf of the state and explicitly to its benefit^[74].

But this early brand of state controlled, imperialist capitalism was gradually eclipsed in favour of Adam Smith's theories on free trade. Early nation states adopted these policies to varying degrees, with the Zollverein treaties of 1833 creating an economic union across the numerous small Prussian localities, before the unification of Germany. This series of treaties vastly reduced the absurd amount of customs and tolls that traders were subjected to when shipping items across the region's many borders. However, the Zollverein treaties were fought with some vigour by the rulers of each of these localities, many of which had become financially dependent upon the income from customs^[75].

Ultimately, these concerns were eroded by the growing power of the German Confederation, champions of free trade between the various German localities. One might ponder on the question, what would have occurred if this confederation had not politically legislated for the policies of free trade? In stark contradiction to the image of the stifling state as a drain on free markets, throughout history, the often maligned nation state has been among the most influential proponents of free trade.

The British Empire, and the full quarter of the globe that it once lay claim to, is further gravity to the intertwining of free trade and the nation state. A noted and conscious shift from militant mercantile imperialism, and towards free trade began with Prime Minister Robert Peel in 1841. Import duties and tariffs were reduced or abolished, and a preference for developing foreign markets emerged. Large, influential companies of the era, such as Maxwell and Wellwood Hyslop transitioned towards freer markets in Latin America, most notably Argentina^[76].

Despite this growing affinity for free trade amongst British businessmen and officials, not all countries willingly altered their laws in the way that Adam Smith would have suggested*, and the British regularly found themselves unable to champion their free trade principles with any degree of immediacy. Consequently, the British employed tactics of seduction and bullying of foreign diplomats to forcibly open markets to the British ideals of free trade. This achieved the desired aims of securing economic prosperity for the empire, but again represents a scenario where the supposed spontaneity of the free market principles was actually thrust upon various colonial nations, at the wishes of an authoritarian military superpower^[77].

Entanglement of the market and the state is however not limited to the darker regimes of oppressive state imperialism. The jewel in the crown of pro capitalist worldviews undisputedly remains the Post War expansion, which delivered the globe out of the second world war and into a dreamlike ascendancy of prosperity measured in decades. Such a period does not earn the moniker 'The Golden Age of Capitalism' without being able to boast about its accomplishments. Renowned free market activist, and consummately successful businessman, Peter Schiff is equally beguiled by this age of untold growth and economic success.

"I don't want the technology of the 1950s, but I want the free market of the 1950s."^[78]

But is this period all that it seemed? What many free market proponents overlook is that this period was equally as fuelled by public sector infrastructure projects as it was by private business. The USA saw the construction of the immense Interstate Highway system, numerous social health programmes and the massive investment into space travel and exploration that would take man to the moon. The period saw the UK begin construction of the National Health Service, as well as the beginnings of the motorway system.

* This was the precise wording that was used in the June 1876 issue of *The Economist*, as explained in Neil Simpson's paper on the *Informal British Empire*^[82]

Of course, none of the above is intended to sing the praises of the state, as this institution has written as chequered a past as any market supporter would take delight in explaining. However, this interconnectivity between state and market cannot be downplayed. In all cases above, the political and geopolitical circumstances of the day directly influence the policies which governments attempt to enforce upon the marketplace.

Conversely, the robustness or dynamism of the market exerts its own unique influence upon governmental policy in a similar way. This is fully predictable when we grasp that parliamentarians and public sector workers interact with the marketplace, and are directly subject to its whims and trends in an identical manner to any other civilian.

As we will see later in chapter 1.9, the very nature of our political views as a society are indelibly linked to the economic circumstances within which the society exists. State and market are therefore intrinsically symbiotic, not discrete, opposed institutions as many reductionist economists would like to believe. With this in mind, the fusion of market and state described in this chapter is fully understandable, and a simple prescription of 'more market; less regulation' is a deeply naive policy suggestion. This adds further gravity to the crux of chapter 1.1, as our subjective views of market freedom are directly tied to the general attitudes of the day.

But the reasoning behind 'crony capitalism' becomes even more tenuous when we consider the second fundamental flaw in its logical basis. The argument for cronyism as an aberration of the true free market overlooks the fact that cronyism and collusion are not exclusively interactions between government and business.

As we have fleshed out in previous chapters, large and influential businesses can collude together in order to alter the dynamics of the marketplace in their own favour. We have already seen this through the LIBOR scandal between banks, the price fixing during WW2 between General Electric and Krupp, or the numerous scandals that have emerged from the UK food and energy sectors. cursory research reveals innumerable other such antics. These kinds of activities objectively erode social benefit, as well as skewing the free market to the benefit of the perpetrators, yet there is no governmental institute in sight to scapegoat for this aberration.

However, we must be fair; even with this in mind, the latent dynamics of the free market may still heroically act to iron out this irregularity by mass upheaval

of the customer base. Companies who price fix, or indulge in other unseemly collusion will inevitably render themselves unattractive to the customer population, and therefore lose their market advantage - or so the story goes. But as we have covered in chapter 1.1, a customer's ability to up-anchor and leave a nefarious business, taking their custom with them, is bounded by human rationality and knowledge of the market.

Knowledge is a commodity, and as we have seen, business interests are keen to invest in the distributors of this commodity by funnelling their financial support behind large mainstream media outlets, such as newspapers or television channels. The media, as we have seen, can act as a tool to muddy the waters surrounding any foul play, but it can also be used to malign the image of businesses that may pose a future threat, Tesla's negative publicity from the New York Times being a prime example.

With this piece in place, we have a theoretical capitalist economy, devoid of any government, where large established businesses collude with each other to the detriment of the populace, while investing in mass media to skulk their misgivings and to smear the plight of any potential competitors.

Free market libertarians hold a fairly eclectic portfolio of worldviews in relation to the above quandary of state versus market. Robert Nozick, Ayn Rand, and other minimal state Libertarians hold that national or local governments may legitimately provide policing, courts, and a military, but nothing more^[79]. More extreme anarcho-capitalists argue that even this is too extensive, while more classically minded libertarians are willing to slacken off the stringent controls on the state somewhat.

How does this anti-state worldview rationalise the observation that business to business collusion is so rife, so profitable, and so detrimental to the theoretical force of creative destruction?

As per Ludwig von Mises' argument detailed in the previous chapter, the explanation behind this phenomenon is to question how a business can come to dominate a market in the first place. In the way that the natural monopoly was written off as simply a case of statist historical revisionism, the capacity for large businesses to acquire such domination over their competitors is too put down to the state's propensity to subsidise lucrative business, and endow them with an artificial advantage.

This may perhaps hold some truth when perusing the oil and energy giants, who reap huge benefits from government contracts and tax breaks. Similar arguments could also be made regarding banks, defence and technology firms. However, there are a wealth of vastly successful businesses which have been deprived of government support and yet still attained dominant positions in their industries. While Google has reaped much in government subsidies, the likes of Facebook or eBay have received meagre benefits in comparison, but remain unassailable in monopolisation of their respective fields^[80].

In a similar manner, cabals and trusts do not necessarily require their individual constituents to have attained a government aided domination of a marketplace in order to see price fixing and anti-competitive behaviour as an attractive option. In October 2014, the Competition Commission of South Africa began investigating allegations of a price fixing scandal in the automotive parts industry, that may have involved as many as 82 separate firms^[81].

So, even in the absence of any state or government, can we realistically hold the free market view that business to business collusion would be significantly less serious? The nuanced view here would suggest that this is a difficult argument to justify beyond any degree of theoretical hand-waving. The symbiotic relationship between the state and the market, and the propensity for business of all shapes and sizes to collude with one another is too compelling to allow this suggestion. Furthermore, the concepts covered in the first chapter confound the issue to a deeper level.

It is important however to proactively side step the false dichotomy of this line of discourse. By describing the inadequacy of the free market rejoinder to solve the problems of corruption, we must not be pigeonholed by default into the state apologist camp, demanding rigorous, centralised regulation of the marketplace. Regulation of the marketplace by the government is too a false messiah for the statist, as it bullishly expects individuals who are privy to governmental fraud, to effectively combat that very same fraud. The absurdity of this of course does not require elaboration.

Conclusions

The existence of corruption within government hardly needs exhaustive discussion at this point. The extent of wrongdoing in the boardrooms of business and the chambers of parliament are largely salient to the general population. The paralyzing crux here is that the public remain ideologically divided as to how to combat these most vile of phenomena. Yet the market versus state dichotomy is such a narrow and infantile superficiality. While those on the market side of the

curtain will demand that the natural order of their individualist ideology be unleashed, few understand the chaotic nature of markets, and the potentially catastrophic implications that can lead on from this.

The flipside is no more pleasant to behold, as those that champion the state battle themselves into an unjustifiable corner. By creating a regulatory state institution that is manned by individuals who are not only privy to their own ability to collude, but are also hopelessly subject to the individualist prerogatives that are encouraged by the very market they are required to regulate, corruption is not only possible, but implicitly persuaded.

The most nuanced and useful assessment to be made here is obviously not found along these ideological paths. Instead, we must recognise that state and market, historically, conceptually and sociologically, are deeply intertwined and reflexive. This view will likely raise ire amongst those on the political left and right, who each have their respective axes to grind, but the fundamental conclusion is unavoidable.

With this fresh view in mind, ideological and organisational arguments fundamentally become economic in nature. Within an economy which is predicated upon a marketplace, the social and political landscape inevitably rallies around this paradigm, and in turn, the marketplace mutates to reflect the political circumstance. The interaction between economic and governmental systems therefore becomes our focus here, rather than the actual construction of either discrete component.

So, does the marketplace play a positive role here? While it may be argued that raw free market forces can act to iron out the corruption by upheaval or creative destruction, these phenomena remain as limited and flawed as when explained in the various preceding chapters. The state is certainly not innocent in these games, but it is purely the pseudo-individualist, consumerist prerogative of the surrounding market that so readily beguiles state employees to chase illicit and acquisitory ends.

Human nature? Perhaps in part; but chapter 2.2 will combat the ideal that humans chase personal wealth irrespective of their surrounding paradigms. Perhaps a more muddy conclusion than other chapters, but the market incentive system certainly does not escape unscathed in the war of words between statist and market fundamentalists.

Chapter 1.7 - References and Notes

- [1]. Thomas Ferguson, *Golden Rule: The Investment Theory of Party Competition and the Logic of Money-Driven Political Systems* (American Politics & Political Economy), University of Chicago Press; 2nd edition (5 July 1995)
- [2]. Larry M. Bartels, *Economic Inequality and Political Representation*, Department of Politics and Woodrow Wilson School of Public and International Affairs, Princeton University, Revised Version, August 2005, pg 53
- [3]. Data taken from Center for Responsive Politics, Open Secrets - <https://www.opensecrets.org/pres12/>
- [4]. Tanya Somanader, *Romney: I'd Like To Repeal Wall Street Reform*, Think Progress, Aug 25, 2011 - <http://thinkprogress.org/economy/2011/08/25/303967/romney-dodd-frank-repeal/>
- [5]. Aditya Chakraborty, *Britain is ruled by the banks, for the banks*, The Guardian, 12 December 2011, <http://www.theguardian.com/business/2011/dec/12/britain-ruled-by-banks>
- [6]. *Off the Charts: Much of World Sees Need for More Regulation*, The New York Times, January 27, 2012, <http://www.nytimes.com/interactive/2012/01/27/business/Much-of-World-Sees-Need-for-More-Regulation.html>
- [7]. *Ibid*
- [8]. Shakuntala Makhijani, *Cashing In On All Of The Above: U.S. Fossil Fuel Production Subsidies Under Obama*, Oil Change International, July 2014
- [9]. Data taken from Center for Responsive Politics, Open Secrets - <http://www.opensecrets.org/lobby/>
- [10]. *Ibid*
- [11]. October Term, 2009 *Citizens United V. Federal Election Comm'n*, Supreme Court Of The United States, Appeal From The United States District Court For The District Of Columbia No. 08–205. Argued March 24, 2009—Reargued September 9, 2009—Decided January 21, 2010 - Case available at: <https://supreme.justia.com/cases/federal/us/558/08-205/>
- [12]. Jasper McChesney, Infographic: *How Money Won Congress*, Represent.us, March 6, 2014 - <http://bulletin.represent.us/infographic->

- money-wins-congress - Original data traceable to Federal Election Commission
- [13]. Kevin Bogardus, *K Street Headhunters Enamored With Upcoming Class Of Retiring Lawmakers*, The Hill, 01/19/12, <http://thehill.com/business-a-lobbying/205017-k-street-headhunters-enamored-with-class-of-retiring-lawmakers>
- [14]. WolfPac - <http://www.wolf-pac.com/>
- [15]. Thomas Ferguson, *Golden Rule: The Investment Theory of Party Competition and the Logic of Money-Driven Political Systems* (American Politics & Political Economy), University of Chicago Press; 2nd edition (5 July 1995)
- [16]. *Study: Americans Still Angry With Big Banks*, Yahoo! Finance, February 24, 2014 - finance.yahoo.com/news/study-americans-still-angry-big
- [17]. Harry J Enten, *Occupy Wall Street's people power loses popularity*, The Guardian, Monday 14 May 2012, <http://www.theguardian.com/commentisfree/cifamerica/2012/may/14/occupy-wall-street-people-power-popularity>
- [18]. Dannagal Young, *National Survey Shows Fox News Viewers are Least Informed, Most Negative, About the Occupy Wall Street Movement*, University of Delaware's Center for Political Communication, February 15, 2012
- [19]. Pew Research Center, *Key Indicators in Media & News*, March 26, 2014 - <http://www.journalism.org/2014/03/26/state-of-the-news-media-2014-key-indicators-in-media-and-news/>
- [20]. Eric Hananoki, *The Koch Brothers Are Using Fox News Employees As Campaigners*, Media Matters for America, July 1, 2014, <http://mediamatters.org/blog/2014/07/01/the-koch-brothers-are-using-fox-news-employees/>
- [21]. Matea Gold and Cristina Rivero, *Inside the \$400-million political network backed by the Kochs*, The Washington Post, January 5, 2014
- [22]. Edward S. Herman, Noam Chomsky, *Manufacturing Consent: The Political Economy of the Mass Media*, Vintage (20 April 1995)
- [23]. Sam Geduldig, Steve Clark, Gary Lytle, Jay Cranford, Proposal: *Occupy Wall Street Response* (email), 24 Nov 2011 - Available at: <http://msnbcmedia.msn.com/i/msnbc/sections/news/CLGF-msnbc.pdf>
- [24]. Chris Moody, *How Republicans are being taught to talk about Occupy Wall Street*, Yahoo! News, December 1, 2011, <http://news.yahoo.com/blogs/ticket/republicans-being-taught-talk-occupy-wall-street-133707949.html>

- [25]. *Ibid*
- [26]. *Perceptions are not reality: The top 10 we get wrong*, Ipsos MORI / Kings College London, 9 July 2013 - <https://www.ipsos-mori.com/researchpublications/researcharchive/3188/Perceptions-are-not-reality-the-top-10-we-get-wrong.aspx>
- [27]. *Ibid*
- [28]. Jason Groves, *Revealed: The £43m paid by elite group of donors for access to top Tories including David Cameron*, The Daily Mail, 23 January 2014 - <http://www.dailymail.co.uk/news/article-2544318/Revealed-The-43m-paid-elite-group-donors-access-Tories-including-David-Cameron.html>
- [29]. *Ibid*
- [30]. Christopher Hope and Robert Winnett, *Analysis: How Adrian Beecroft proposed to rip up decades of employee rights to boost the economy*, The Telegraph, 21 May 2012, <http://www.telegraph.co.uk/news/politics/9275558/Analysis-How-Adrian-Beecroft-proposed-to-rip-up-decades-of-employee-rights-to-boost-the-economy.html>
- [31]. Sheryl Gay Stolberg, *The Art of Political Distraction*, The New York Times, March 21, 2009
- [32]. Juliette Jowit, *Strivers v shirkers: the language of the welfare debate*, The Guardian, 8 January 2013, <http://www.theguardian.com/politics/2013/jan/08/strivers-shirkers-language-welfare>
- [33]. Matthew Goodwin and Robert Ford, *Just how much media coverage does UKIP get?* New Statesman, 11 November, 2013, <http://www.newstatesman.com/politics/2013/11/just-how-much-media-coverage-does-ukip-get>
- [34]. Lee Williams, *If people voted for policies, the Green Party would win the next election*, The Independent, 27 November 2014 - <http://www.independent.co.uk/voices/comment/if-people-voted-for-policies-the-green-party-would-win-the-next-election-9887199.html>
- [35]. Scot Paltrow, *Special Report: The watchdogs that didn't bark*, Reuters, Dec 22, 2011 - <http://www.reuters.com/article/2011/12/22/us-foreclosures-idUSTRE7BL0MC20111222>
- [36]. *Ibid*
- [37]. Scot Paltrow (Reuters), *Federal Prosecutors Have Stayed On Sidelines In Mortgage Cases, Despite Wealth Of Evidence*, The Huffington Post, 22 Dec 2011,

- http://www.huffingtonpost.com/2011/12/22/federal-prosecutors-mortgages_n_1164866.html Vegas
- [38]. *Ibid*
- [39]. Jeffrey Reiman, Paul Leighton, *The Rich Get Richer And The Poor Get Prison - Ideology, Class, And Criminal Justice*, Pearson; 9 edition (29 July 2009)
- [40]. Patricia Kennett (Editor), Alex Marsh (Editor), *Homelessness: Exploring the New Terrain*, Policy Press (1 Sept. 1999), pg 138
- [41]. *Prison: The Facts - Bromley Briefings Summer 2013*, The Prison Reform Trust - Drawing on data from: National Offender Management Service (2007), *Signposting Offenders to Financial Capability Training, Debt Advice and Financial Services*, London: Ministry of Justice, and, Bath, C., and Edgar, K. (2010) *Time is Money: Financial responsibility after prison*, London: Prison Reform Trust
- [42]. *Poverty and the Criminal Justice System*, Defending Justice.org, Political Research Associates, 2005
- [43]. Martin Rosenbaum, *The role of FOI in MPs' expenses*, BBC News, 8 May 2009 - http://www.bbc.co.uk/blogs/opensecrets/2009/05/the_role_of_foi_in_mps_expense.html
- [44]. Peter Walker, *Bradley Manning trial: what we know from the leaked WikiLeaks documents*, The Guardian, 30 July 2013, <http://www.theguardian.com/world/2013/jul/30/bradley-manning-wikileaks-revelations>
- [45]. Jack Mirkinson, *Jeremy Scahill: Bradley Manning Media Coverage 'Shameful'*, The Huffington Post, 07/30/2013, http://www.huffingtonpost.com/2013/07/30/jeremy-scahill-bradley-manning_n_3678476.html
- [46]. *Policing Assange Embassy Has Cost £6.5m*, LBC News, 19th June 2014
- [47]. Cyril Dixon, *£2.75m, the cost of paying bill for Hamza's hatred*, The Daily Express, Jul 8, 2008 - <http://www.express.co.uk/news/uk/51526/2-75m-the-cost-of-paying-bill-for-Hamza-s-hatred>
- [48]. Dan Roberts, *Bolivian president's jet rerouted amid suspicions Edward Snowden on board*, The Guardian, 3 July 2013, <http://www.theguardian.com/world/2013/jul/03/edward-snowden-bolivia-plane-vienna>

- [49]. Barry Yeoman, *Soldiers of Good Fortune*, Mother Jones, May/June 2003 Issue
- [50]. Smedley Darlington Butler, *War Is A Racket*, Round Table Press 1935
- [51]. *Ibid*
- [52]. *Ibid*
- [53]. Commission On Wartime Contracting In Iraq And Afghanistan - Final Report To Congress, *Transforming Wartime Contracting Controlling Costs, Reducing Risks*, August 2011
- [54]. *Blackwater to pay \$7.5 million after admitting arms sales violations*, The Telegraph, 08 Aug 2012
- [55]. Kia Makarechi, *Blackwater Manager Reportedly Threatened State Department Investigator With Death*, Vanity Fair, June 30, 2014
- [56]. Academi, Board of Directors - <https://www.academi.com/pages/about-us/board-of-directors/>
- [57]. Ed Sard (alias Frank Demby), Walter S. Oakes and T.N. Vance, *Towards a Permanent Arms Economy?* 1944
- [58]. Peter Custers, *Military Keynesianism today: an innovative discourse* Race & Class 51 (4): pp79–94, 2010.
- [59]. Noam Chomsky, *The Pentagon System*. Z Magazine (Reason) February 1993
- [60]. Robert B Durham, *Supplying the Enemy: The Modern Arms Industry & the Military–Industrial Complex*, Lulu, 29 May 2015, pg 170
- [61]. Glen Yeardon, *The Nazi Hydra in America: Suppressed History of a Century - Wall Street and the Rise of the Fourth Reich*, Progressive Press (1 Jan. 2012), pg 140
- [62]. Jack Mirkinson, *Chris Hayes Apologizes For Saying He Feels 'Uncomfortable' Calling Killed Soldiers 'Heroes'*, The Huffington Post, 05/28/2012 - http://www.huffingtonpost.com/2012/05/28/chris-hayes-uncomfortable-soldiers-heroes_n_1550643.html
- [63]. *Ibid*
- [64]. Richard Norton-Taylor, *Iraq: the legacy - Ill equipped, poorly trained, and mired in a 'bloody mess'*, The Guardian, Friday 17 April <http://www.theguardian.com/world/2009/apr/17/iraq-war-british-army>
- [65]. Jonathan Beale, *UK troops leave Afghan mission with better equipment*, BBC News, 20 January 2014 - <http://www.bbc.co.uk/news/uk-25803487>
- [66]. Hearings Before The Subcommittee On Courts, Civil Liberties, And The Administration Of Justice Of The Committee On The Judiciary House Of Representatives, Ninety-Seventh Congress, Second Session On H.R. 4783, H.R. 4794 H.R. 4808, H.R. 5250, H.R. 5488, And

- H.R. 5705 Home Recording Of Copyrighted Works, April 12, 13, 14, June 24, August 11, September 22 And 23, 1982
- [67]. Hope DeFelice, *Copyright:Gone With the Betamax?*. New York University Review of Law and Social Change. VIII no. 1 London, 1979.
- [68]. Mark Rogowsky, *After The New Jersey Ban, Here's Where Tesla Can (And Cannot) Sell Its Cars*, Forbes, 15 March 2014, <http://www.forbes.com/sites/markrogowsky/2014/03/15/after-the-new-jersey-ban-heres-where-tesla-can-and-cannot-sell-its-cars/>
- [69]. Amy Wilson, *How Texas dealers slammed the door on Tesla*, *Automotive News*, September 9, 2013
- [70]. John M. Broder, *Stalled Out on Tesla's Electric Highway*, *The New York Times*, 8 Feb 2013 <http://www.nytimes.com/2013/02/10/automobiles/stalled-on-the-ev-highway.html>
- [71]. Joann Muller, *Tesla's Gotcha Blog Catches New York Times Reporter Driving In Circles*, Forbes, 14 Feb 2013 <http://www.forbes.com/sites/joannmuller/2013/02/14/teslas-gotcha-blog-catches-new-york-times-reporter-driving-in-circles/>
- [72]. Adam Vaughan, *Elon Musk: oil campaign against electric cars is like big tobacco lobbying*, *The Guardian*, 24 Oct 2013 - <http://www.theguardian.com/environment/2013/oct/24/elon-musk-oil-electric-cars-tobacco-tesla>
- [73]. Gabe Elsner, *Koch Network, Fossil-Fuel Front Groups Lobby Congress Against Wind-Energy Tax Breaks*, *The Huffington Post*, 19 June 2014 - http://www.huffingtonpost.com/gabe-elsner/koch-network-fossil-fuel-_b_5509075.html
- [74]. Elise S. Brezis, *Mercantilism*, *The Oxford Encyclopedia of Economic History*, Oxford University Press, 2003
- [75]. Arnold H. Price, *The Evolution of the Zollverein: A Study of the Ideals and Institutions Leading to German Economic Unification between 1815 and 1833*, Ann Arbor: University of Michigan Press, 1949
- [76]. D. C. M. Platt, *Latin America and British Trade 1806 – 1914*, London, 1972, p.26.
- [77]. J. Gallagher, R. Robinson, *The Imperialism of Free Trade*, *Economic History Review*, Volume 6, 1953, p.1.
- [78]. Quote from GoodReads.com
- [79]. Robert Nozick, *Anarchy, State, and Utopia*, Wiley-Blackwell; New Ed edition (4 Jan. 2001)

- [80]. Mike Elgan, *Understanding Facebook's Monopoly*, Datamation, November 28 2012
- [81]. Stephen Grootes, *Price-fixing claims hit automotive parts industry*, Eyewitness News, October 2014, - <http://ewn.co.za/2014/10/13/Allegations-of-pricefixing-in-automotive-parts-industry>
- [82]. Neil Simpson, *The British Empire; An Informal Empire?* - http://www.britishempire.co.uk/article/informalempire.htm#_ftn3
- [83]. Public Mind Poll, *Some News Leaves People Knowing Less*, Fairleigh Dickinson University, Nov. 21, 2011
- [84]. Reece Peck, *'You say rich, I say job creator': how Fox News framed the Great Recession through the moral discourse of producerism*, *Media, Culture & Society*, May 2014; vol. 36, 4: pp. 526-535., first published on April 17, 2014

1.8 Inequality

THE IDEA OF EQUALITY is one which is contentious. The collapse of the Soviet Union and other communist states has historically been viewed as the final nail in the coffin of such egalitarian utopianism. We cannot all have the rigor and intellect to be doctors or astrophysicists; we do not all possess the hardiness to be bricklayers or heavy labourers. We do not all have the physique to become athletes, the creativity to become artists and musicians, or the way with words to become poets. This is simply the rich variety imparted upon us by way of our genetics, our upbringings and our life events. It is complex and eclectic and should be treasured as a uniquely human wonder.

This reasoning however differs from the line of attack in this chapter. The above, uncontroversial stance relating to the inequality of diverse and varied human traits is frequently used (among others) as a rationale for a more insidious form of inequality; economic inequality.

Economic inequality is an increasingly touchy subject in the current financial climate. As of time of writing, the Western world has just witnessed the birth of the Occupy movement. This movement carries a powerful message as its tagline, highlighting the shocking inequity of the wealth divide between the top 1% and the bottom 99% in Western market democracies.

But what exactly is economic inequality, and why has it become such a central topic of debate? Speaking roughly, the economic inequality between people may be alternatively expressed as an inequality of incomes. Within a modern market system, an actor has access to the goods and services which an economy provides through their purchasing power, which is largely dependent on income (inheritance and savings may become relevant to richer people, but this will be covered later).

In general, it may be said that a person of lower income will have more limited access to the services and products available in a market economy. The reasoning behind this typically follows three broad assumptions: that the actor in

question has a profession which is in some way inferior to those paid more (in less demand; of lesser quality; of lesser education, or, of lesser contribution to society); the actor does not work as hard as those who are paid more, or; the incentive system works to encourage low paid workers to strive for higher paid positions.

As always, this rundown of rationalisations may not be comprehensive. As such, if you have any additional persuasion as to why a market may determine that certain people are given more limited access to resources, then bear this reason in mind when reading the next subsections. It will be these rationalisations for economic inequality which we tackle initially, but first, we must assess the extent of the economic inequality that we are wrestling with.

The Reality

The reality of economic inequality within the global market economy is not a pleasant one, but nor is it clear cut and definitive of a consistent worsening situation, as many on the hard left may like to claim. We must focus here on two broad scopes in which economic equality can be measured, that is; between nations, and within nations. The broader of the two scopes - inequality between nations - will be discussed first.

It is often a point of contention as to whether global inequalities between nations are widening or contracting. An in depth study by *The Economist* in 2004 was generally sanguine regarding the plight of the poor under the global market paradigm, and argued that when population of nations was taken into account, the gap was narrowing^[1].

This argument is summarised in Figure 1.8-1 and Figure 1.8-2, with the first graph aggregating the growth of GDP per head across nations. This shows generally predictable, consistent growth of GDP per head in the richer countries to the right hand side of the graph, but a much more inconsistent spread of performance amongst the poorer countries to the left. This produces a mild downward sloping trendline, indicating that on average, the gap between nations is worsening.

However, as the second graph shows, when each nation is weighted by population, the huge numbers of Indian and Chinese citizens drag the average up through their nation's impressive performance, therefore trumping growth in the developed world, and demonstrating that they are 'closing the gap'.

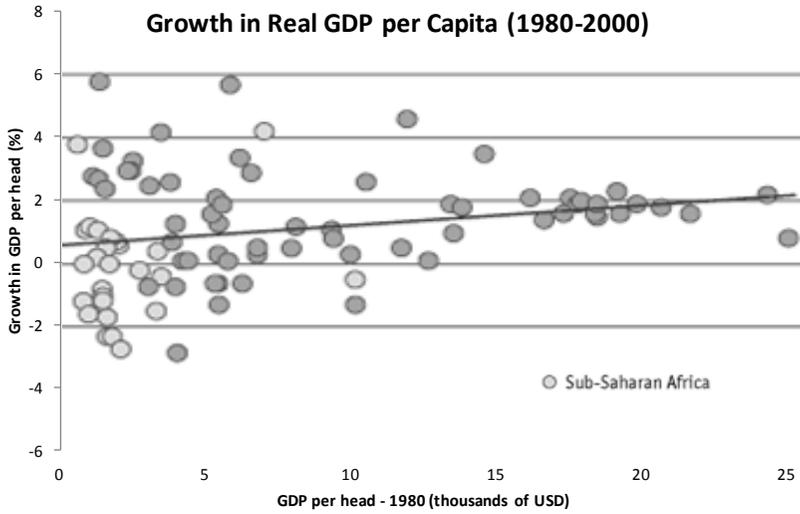


Figure 1.8-1: Plot of GDP per capita growth across nations - Note that the poorer nations (left side of the graph) register lower percentage growth rates than the richer nations (right side of the graph) - This indicates a widening gap - Adapted by author from [1]

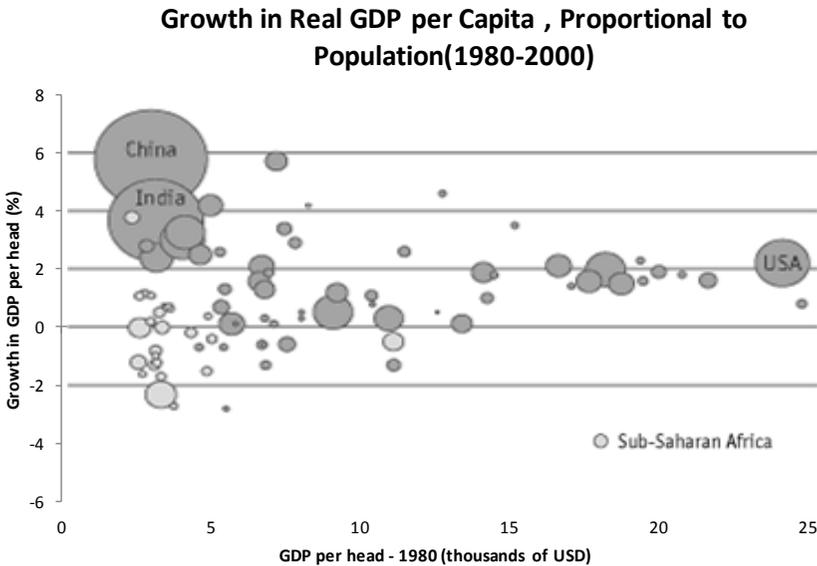


Figure 1.8-2: Plot of GDP per capita growth across nations, taking in to account the population size of nations - Note that the trend of the previous figure is reversed when considering that the poor nations with the largest growth are the ones with the largest population - This equates to, *The Economist* argues, a narrowing gap in terms of the average individual - Adapted by author from [1]

We must however be careful when appraising this view, for two primary reasons. Firstly, averaging the GDP per capita of a population does not necessarily reflect an improvement of the average man or woman within these nations. The growth demonstrated by the likes of India or China may well generate tremendous wealth for those in the upper strata of society, while leaving the poor relatively unchanged. *The Economist* is slightly more level-headed when assessing whether or not this is a factor, as it emerges that on different measures, completely different conclusions can be drawn^[1].

These methods either draw upon household surveys, or national accounting in order to obtain generalised data about household consumption. Angus Deaton of Princeton University commented on this discrepancy:

“If the surveys are wrong, and the national accounts right, either inequality has been widening in ways that our data do not appear to show, or poverty has been falling more rapidly than shown by the dollar-a-day counts. If the surveys are right, there has been less growth in the world in the 1990s than we are used to thinking.”^[2]

The second reason why perhaps the market-centric view of global inequality should be given a wide berth is that this particular argument was written in 2004. This was a full 4 years before the global financial crisis abruptly ended the period of relative global prosperity which preceded.

Among others, Englebert Stockhammer, Professor of Economics at Kingston University London has argued that the 2008 financial crisis was at least partially caused by persistent inequality within nations, notably the USA. Stockhammer champions a four channel hypothesis as to how social and economic inequality interacted with financial markets in order to exacerbate the crisis^[3]. This is shown below:

- *Channel 1: Rising inequality has led to stagnating domestic demand, namely consumption demand.*
- *Channel 2: The deregulation of international capital flows has relaxed the external balance constraint and allowed countries to run larger current account deficits. This has allowed for the development of two distinct growth models: a debt - led growth model that came with a consumption boom and current account deficits, and an export - led growth model.*
- *Channel 3. Rising inequality contributed to household debt (in the debt - led models).*

- *Channel 4. Rising inequality has increased the propensity to speculate.*

Since the crisis, those in poverty on a global scale have not fared as well as market apologists may like to claim. A study in early 2014 by the UN Development Programme showed that:

"On average—and taking into account population size—income inequality increased by 11 percent in developing countries between 1990 and 2010.

A significant majority of households in developing countries—more than 75 percent of the population—are living today in societies where income is more unequally distributed than it was in the 1990s."^[4]

This impact of the financial crisis on poor nations has been further explored by a sprawling paper by the Institute of Developmental Studies, headed by Dr Neil McCulloch and sourcing contributions from 21 experts in various developing economies around the world.

"Evidence shows that poverty, malnutrition and infant mortality increased during every national financial crisis in the past 11 years," ^[5]

McCulloch explains;

"Eating less frequently and less diverse and nutrient-rich foods was commonly reported... Many report not being able to make ends meet. Managing food, health and educational needs has been a struggle, and not only for the very poorest. For some, particularly children, the impacts may be permanent: children who drop out of school to earn or because their parents cannot afford fees, books or breakfast, are unlikely to re-enrol once food prices decline." ^[5]

In stark contrast to those pushed further into extreme poverty in the wake of the financial crisis, a scathing Oxfam report in 2014 found that the number of dollar billionaires around the world has more than doubled since 2008^[6].

Perhaps even more absurdly, the amount of billionaires around the globe has increased at a rate higher than those with wealth over 100 million, which in turn, has increased at a rate higher than those with 10 million, 1 million, etcetera. This is shown in Figure 1.8-3.

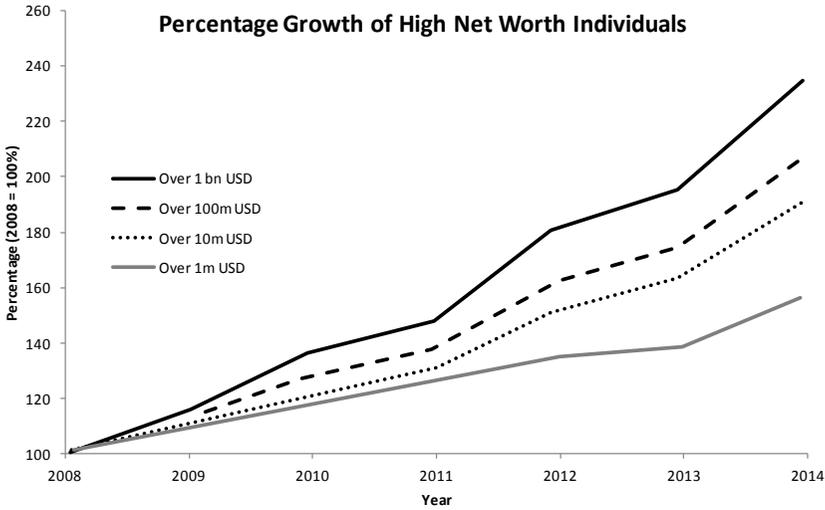


Figure 1.8-3: Plot of increases in High Net Worth individuals worldwide since 2008 - Note that level of wealth and growth are correlated, with the most wealthy growing by the largest proportion - Adapted by author from [7]

The result is a global pyramid of wealth distribution in which the top 0.7% of global society wield nearly 45% of the globe's total wealth. This is obviously a difficult fact to grapple with due to the sheer scale of numbers involved, but the fact remains. An attempt to illustrate this has been made in Figure 1.8-4.

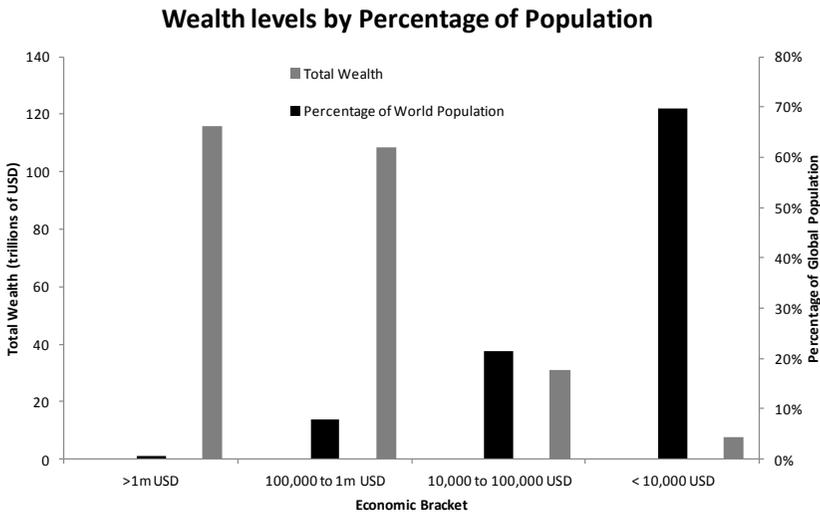


Figure 1.8-4: Plot of total wealth versus percentage of global population - Adapted by author from [8]

So, data suggests that the cause of the recent financial crisis is at least to some extent entangled with the concepts of economic inequality. Additionally, a good basis of evidence shows that the resulting economic effects of such financial crises bolster the extremely rich and punish the extremely poor. As such, we can make a fairly compelling argument that inequality has indeed worsened in at least the medium term.

However this observation becomes more intractable when scrutinising the dynamics within nations themselves, particularly nations which are part of the assumed prosperous developed world. Figure 1.8-5 shows the Gini coefficient (a common statistical measure for income inequality), relative income poverty, and ratio of wealth of the top 10% versus wealth of the bottom 10% wealth, aggregated across all OECD countries from the mid 1990s to 2012. All measures have seen a consistent and marked increase, even through the supposed successes of the 1990s and the era preceding the financial crisis.

OECD Economic Inequality 1995-2011 - Various Measures

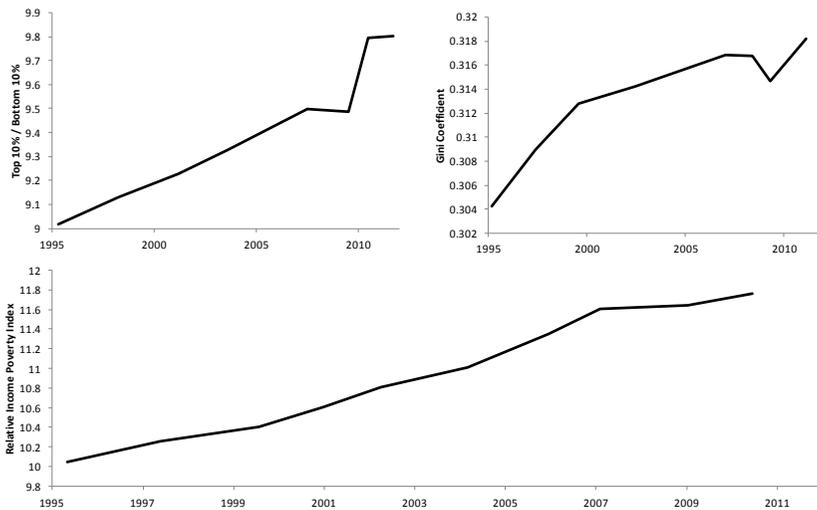


Figure 1.8-5: Various measures of economic inequality - OECD nations - Data taken from [9]

However, some sense must be made of averaged statistics across a group of countries as diverse as the OECD. It may be a possibility that these datasets are skewed in some way by countries which have observed an extreme progression of economic inequality. Figure 1.8-6 shows the Gini coefficients of the G7 OECD nations alongside other Oceanic and Nordic countries over a longer time period. It is clear that all of these nations have observed a steady creep upwards

in economic inequality since the 1970s, perhaps apart from France, which has remained relatively consistent.

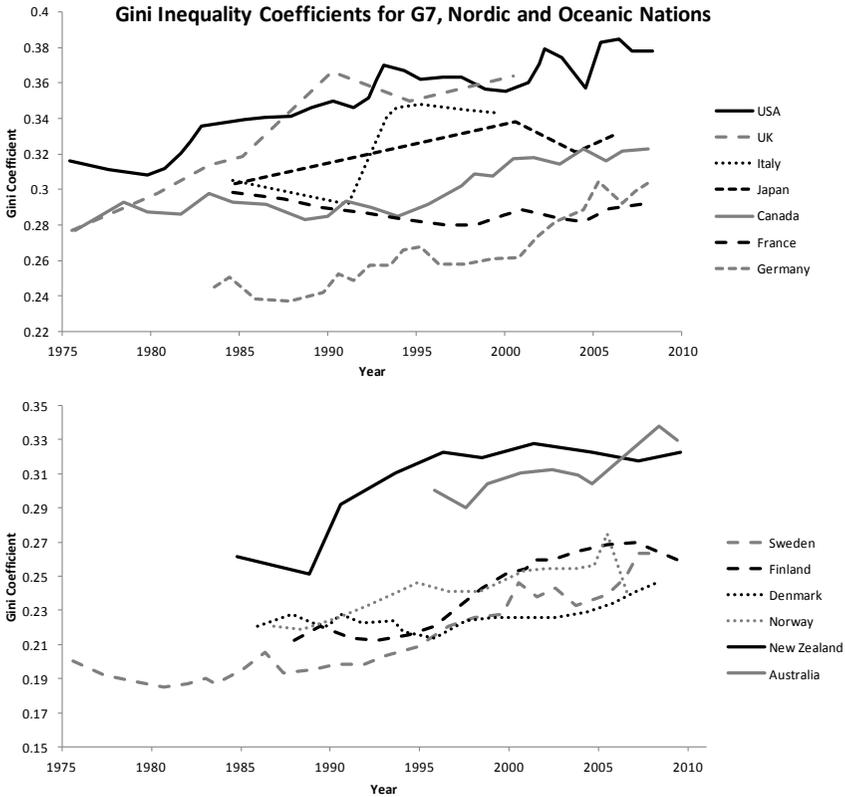


Figure 1.8-6: Plots of Gini coefficients across individual OECD nations - Adapted by author from [10]

Other measures also seem to reflect similar trends. In a 2013 study presented to the International Labour Organisation in Geneva, it was found that the ratio between employee wages and gross domestic product had fallen significantly in almost every OECD country between 1970 and 2007^[11]. A selection of OECD nations from the report is shown in Figure 1.8-7. The study went on to further state that, "while the development of income distribution in developing countries is more heterogeneous, wage shares have, on average, also declined there and personal income distribution has become more unequal."^[11]

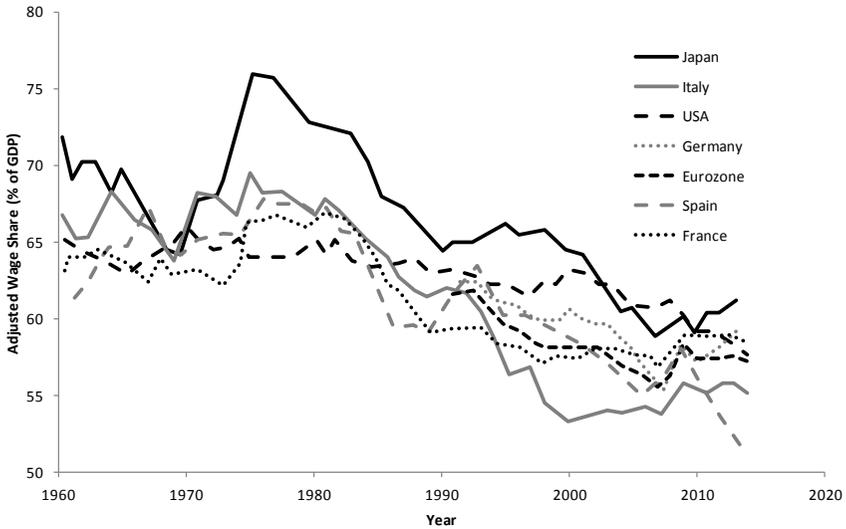


Figure 1.8-7: Wage Share in a selection of Developed nations - 1960-2013 - Adapted by author from [11]

Given the plethora of evidence, it is clear that income inequality is real, is of a worrisome scale, and may even be getting worse. This latent anxiety about the issue is also generally reflected in public opinion. In 2012, Pew Research Center carried out a survey of 2,048 American adults. The study found that about two-thirds of the public (66%) believes there are either "very strong" or "strong" conflicts between the rich and the poor. Surprisingly, this study also showed that the rich shared these beliefs^[12].

Influential academics in the field have also echoed similar irks as the general public. Joseph Stiglitz, Nobel laureate in economics, Columbia University professor and chief economist for the World Bank, was quick to shoot down apologetics for the trends in global income distribution:

"There are all kinds of excuses for inequality: It is beyond our control – market forces like globalization, trade liberalization, the technological revolution, the "rise of the rest." Others assert that doing anything about it would make us all worse off, by stifling our already sputtering economic engine. These are self-serving, ignorant falsehoods."^[13]

It is one of these "self-serving, ignorant falsehoods" which will segue us nicely into one of the most pervasive myths of the market; the concept of meritocracy, and it's supposed justification of income inequality.

The Subjectivity of Contribution

The rationalisation of economic inequality is often a simple one, and is theoretically based upon the contribution of an individual to the society in which they reside. However, an individual's (or company's) contribution to a society is solely measured using market based currency, and as such is backed by individualistic and short term prerogatives.

As we have already seen, these prerogatives are generally insensitive to collective or long term forms of value, and as such these considerations are not fully modelled within the currency. The result of this is that economic purchasing power is distributed unequally based upon these ideals, allowing for situations where companies or individuals who may well be destructive and dangerous in the long term are rewarded as leading contributors in the short term. Conversely, individuals or companies which contribute a great deal to society but are not commercially successful are economically punished upon the basis of a lack of contribution.

Examples of this line of thought are myriad, and can be explained in a scope as large as the entirety of the consumer society itself. Repetitive consumption is a manifestation of short term individual profit to the detriment of long term, collective resource sustainability. Yet the entirety of the stock market system assesses the value of producers based upon the consumption of their products. The higher the profit, the higher the assumed contribution, and the greater the financial reward. Of course, there are individuals and companies who succeed in balancing long term and collective worldviews alongside financial profit, but the market's value definition does much to inspire the opposite to succeed.

At the other end of the scale, actors who provide the economy with valuable and tangible services, such as nurses, fire-fighters or refuse collectors, do not have access to significant economic power, as they do not contribute much within the narrow definition of value. It is however obvious to most of the population that the above professions provide far more to society, and do so with far greater sacrifice to themselves than a great many of the professional capitalists, who deal primarily in the smoke and mirrors of speculation.

We can therefore see that there is a large subjectivity within the labour market as to what contribution is and how to measure it. Ironically, based on the ideals of

those who champion the marketplace, we should be paying the average nurse the equivalent of a Wall Street CEOs salary.

However, our definition of value is not all there is to consider here, as the fusion of institutions, government and industry does must to resist such interpretations of value in ways we have discussed. Further discussion of value is presented in chapter 1.12, for now it is prudent to understand that the traditional view of contribution is not an argument that holds any weight, and should be given very little attention when used as a talking point to resist change.

Economic Rejoinders for Inequality

The idea of contribution is nowhere more ingrained than within the topsy-turvy realm of neoclassical economics. As we have seen so far, the dominant global school of economic thought is littered with static and often dogmatic interpretations of society, disguised as rigorous science. In the field of income distribution, the neoclassical school is sadly no different.

Within the narrow lens of economic theory, wages are merely a reflection of the marginal product of labour and capital. Any increases in earnings secured by a certain profession simply underline the increases in productivity of their sector. As price is considered to be a valid measurement of marginal benefit to society, we may rest assured that high paying careers generate far reaching social value which all of us may revel in.

I will sidestep any digressions into the recent financial crisis which brought the global economy to a shuddering halt, but any intuitive individual should realise that the high paying finance industry did not necessarily act as a workhorse for social value during this period.

The keystone of this precarious economic observation is carved from one simple principle; labour is viewed as a commodity like any other. There is however a fundamental problem with this assumption. Labour is not produced and sold for profit in the same way other commodities are.

Within a perfectly competitive marketplace* products are created by a large pool of small sized firms. As these firms are assumed to have no effect on the market as a whole, the wage they must pay to remain competitive is constant (as dubious as this seems). The firm is however limited by how many workers it can hire, due to its fixed capital (machines and equipment). For each additional

* This idea has been discredited in chapter 1.6, but for the sake of argument, let us pretend that it is valid.

worker hired, the firm sees diminishing marginal productivity, that is, each worker hired adds less productivity than the one before. This view is however subject to a wide array of rather serious flaws, only the two most serious of which I will cover here*.

Firstly, while the stalwart neoclassical supply and demand curves have been debunked earlier on, the labour market supply and demand curves are wrong for different reasons. An approach to model the labour market as previously described rests quite gingerly on the idea of an upward sloping "supply" curve for labour. This means that for a higher wage, a larger amount of labour is purchased, either because the job is more highly skilled, or because the individual worker is particularly good. Superficially, this seems to be a fair assumption, but it becomes very easy to think of aspects where this does not hold.

Consider the case of a career which is adequately flexible. An individual paid a high wage may comfortably work the bare minimum core hours and walk out the door with a satisfactory income for the month. All the while, an individual on a lesser hourly rate may need to put in a few hours of overtime of hard work each week in order to accrue a wage which is satisfactory.

While this observation may seem subtle, it fundamentally undermines the model of the labour market which neoclassical economics clings to. An individual paid more can do less, and amongst those of us who live and work in real environments, far from the isolated, academic towers of economics, we can observe this phenomenon on a daily basis.

But the problems with this model are not confined to the supply side of the graph. The demand curve for labour has an equally torrid time rationalising its existence. Despite the ramblings of neoclassical theory, involuntary unemployment is an obvious reality[†]. The demand curve of the labour market is not an insatiable beast which hungers for ever growing employment. Instead, it is entirely possible for the amount of labour demanded by industry to fall short of the total potential labour which the supply side of the labour market has to offer.

* For those of you interested in perusing other woeful shortcomings in neoclassical economics' ability to rationalise income inequality, I recommend chapter six of Steve Keen's *Debunking Economics*.

[†] As quoted by Keen: "According to economists, a worker's decision about how much labor to supply is made the same way he decide show much to consume."

Manipulation of wage rates has no comprehensive link to how the labour side chooses to sell its labour. It borders on the absurd to suggest that the hordes of highly skilled and highly motivated young people in the UK, many with technical degrees and other diplomas, are *choosing* to work low skill supermarket jobs or remain on the unemployment line. The issue instead lies with the demand for labour diminishing across various industries, a phenomenon that has been discussed fully in chapter 1.5.

The second, and perhaps the most egregious logical error that I have yet found within the tomes of our current dominant school of economic thought, relates to the initial development of income inequalities.

While the perfect competition model discussed earlier (in brief) considers the wage as a constant which is set by the nature of the marketplace, it puts little effort into explaining how this market norm was established, and indeed what existed before. The fact of the matter is that neoclassical economists don't know either; in fact, they know so little about how income distributions come into existence that they invent an imaginary dictator, who distributes income optimally before allowing the free market to take over.

Sadly this 'benevolent central authority' as it is known, is not an obscure economic proposition, invented by a widely discredited economist, it is in fact verbatim from one of the most widely used and acclaimed textbook of neoclassical economic thought.

"Let us now hypothesize that there is a process, a benevolent central authority perhaps, that [...] redistributes wealth in order to maximise social welfare [...]."^[14]

I would hope that at this point, any level of respect for the empiricism of economics that may have existed in the past has swiftly left the reader's psyche. The monumental and baffling absurdity of this statement is confounded further when considering favoured neoclassical policies. Despite championing a world where the market must operate unperturbed by government intervention, the neoclassical model of the market *requires* imaginary government intervention on a huge scale to even determine how income is distributed.

The upshot of this litany of errors within the neoclassical model of the labour market is that inequality cannot be justified from an empirical standpoint. There is no sound argument within our current economic paradigm that can rationalise the existing income inequalities both between and within societies. This inability

to put forth credible apologetics for such disparities in income becomes even more inexcusable when the emergent costs of inequality are considered.

Unequal societies suffer from serious social and economic problems at an aggregate level. The failure of economic theory centred on the individual to account for these emergent phenomena ironically lessens the prosperity of the individual. It is therefore clear that neoclassical economics does not possess adequate theoretical backing to justify an unequal society. But what are these ramifications of inequality?

The Effects of Inequality

Perhaps the most visible and polemic publication in this field is *The Spirit Level* by Professor Richard Wilkinson and Kate Pickett, a book which has garnered somewhat of a media following. However, despite widespread positive reviews, the analysis behind this publication seems to grossly oversimplify the inherent complexity of sweeping social comparison. It is incredibly difficult to accurately measure the effect of inequality across countries with starkly different climates, cultures, population densities and so forth.

It is well documented how environments invoke psychological responses, such as the weather's link to seasonal affective disorder in Nordic countries, yet these factors do not appear to be corrected for within *The Spirit Level's* statistical models. Likewise the strong cultural differences between Japan and the other predominantly Western European/North American nations is not considered as a factor even when Japan seems to perform exceptionally under most criteria.

The Spirit Level has thus summoned great criticism, inspiring a book by Christopher Snowdon dedicated solely to disproving the claims put forth^[16]. The connections of this author to a staunch libertarian think tank known as The Democracy Institute however points to some political motivation behind this release, and both the institute and the author's relationship to large tobacco corporations suggests interests may be vested^[17].

However, an intellectually mature view is needed here. While *The Spirit Level* may oversimplify the factors behind societal cohesion and functionality, it is none the less a rigorous body of work, calling upon a strong basis of peer reviewed literature, much of which will be perused in this chapter. There is no doubt that *The Spirit Level* is barking up the right tree so to speak, but such conclusive results across the board are not conducive with a culturally and environmentally diverse world. Indeed, re-creations of the observations on a wider scale have been difficult pin down^[16].

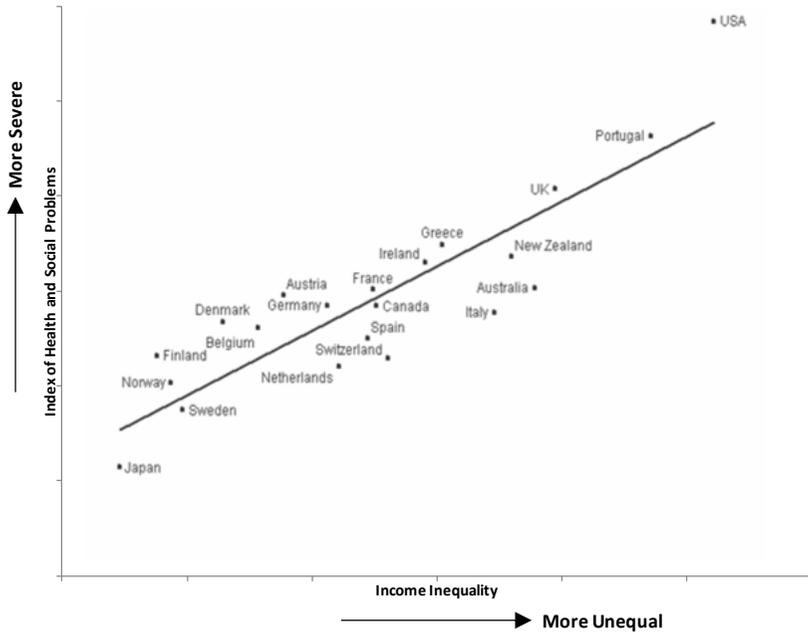


Figure 1.8-8: General Conclusions of 'The Spirit Level' - Income inequality vs. Index of social problems - Adapted by author from [15]

The effects of inequality are therefore better scrutinised on a more microscopic level, and have been studied in great detail to these ends. Perhaps the most intuitive place to start when assessing the effects of inequality is the actual chemical reactions which occur in the human brain, when subjected to inequitable social circumstances.

Biologically, our understanding of inequality is progressing, and it may affect us in ways that are deeper than initially theorised. According to Neuroscientist Evian Gordon's Integrate model, the overarching principle of the brain is to minimise perceived danger and maximise perceived rewards. The human brain, as frequently as five times every second, subconsciously assesses what is dangerous and what is potentially rewarding, before tailoring its behaviours in line with the circumstances^[19].

Understandably, the primal survival prerogative of the brain leads to a higher emphasis on the danger response when compared to the reward seeking response. Threats are immediate, require a quick response and are difficult to ignore, therefore the primitive limbic system of the human brain pays special extra attention to these kinds of stimuli.

As a result of this level of emphasis, threats of danger are also deeply taxing on the brain and body. They demand oxygen and glucose from the blood, which are diverted from other functional parts of the brain, including the working memory function, which processes new information; cortisol and other stress related hormones are also released^[19].

In 2009, research published by Hidehiko Takahashi et al. shows that when people realize that they might compare unfavourably to another, the response is starkly similar to that of a threat of imminent danger. The situation instils a credible subconscious sense of panic and a need to take evasive action^[20].

Dr. David Rock is a neuroscientist who has applied his trade in the realm of workplace coaching. In Rock's SCARF model, he argues that there are five primary social measurements that are of particular importance to the brain. These are status, certainty, autonomy, relatedness and fairness. A perceived drop in any of these domains activates the threat response and raises stress hormones in the body^[21].

A more hierarchical society based upon income increases status and perceived fairness gaps in society, which solicit threat responses from the brain with regularity. The debilitating effect of increased cortisol that occurs under perceived threat can act to reduce immune function, damage tissues, inhibit memory formation, impair the ability to control impulses and even damage the overall capacity to process new information^[23].

Unsurprisingly, children who are raised under inequitable social circumstances develop starkly different character traits when compared to more egalitarian environments. In June 2011, UNICEF issued a qualitative study on the behaviours of children in Spain, Sweden and the UK. The broad findings of the study were scathing against economic inequality amongst children, and its relation to materialism and well being:

"It was also very notable that the secondary school groups which were most animated, vocal and often bitter about these differences were those in the mixed affluence areas regardless of whether they themselves were richer or poorer. This reinforces previous work which suggests that when children rub shoulders with peers from different socio-economic backgrounds, social comparison impinges to a much greater extent on their everyday experiences.

Even in Sweden which had the smallest gap between rich and poor in the UNICEF study, living in a mixed affluence area brought problems such as bullying around the issue of mobile phones. This discussion was reminiscent of another UK study where poorer children were bullied for having the 'wrong' trainers'."^[24]

The study demonstrated with some gravity, that children are negatively affected by the concept of inequality even when it is fairly benign, and regardless of their own social status. This assessment that those of high social class are also embittered and negatively affected by income inequality is an effect which persists beyond childhood, perhaps counter intuitively.

But contrary to popular belief, the effects of income disparity and its negative ramifications on those at the top of the economic food chain are well established in scientific literature. In a study published by the Association for Psychological Science, individuals of a higher social class were found to lack empathy when compared to those in lower social standing^[25].

Paul Piff is an Assistant Professor in the Department of Psychology and Social Behaviour at the University of California, who has carried out extensive research into the behaviour of economically privileged individuals. In 2013 Piff carried out a study on the UC Berkeley campus in which several pairs of individuals were pitted against each other in a game of Monopoly, except with an additional twist; before the game, one of the players was randomly assigned an obvious and unassailable advantage over the other. The random player would receive double the starting money, would accrue double the money each time they passed go, and was able to roll two dice rather than one^[26].

Each game started off with the players acknowledging that something seemed strange in the way that the game was arranged. However, as the game progressed, the player who had received the advantages at the outset began to behave in consistently bizarre ways. The demeanour of the winning player would change, to the extent that they would gloat, brag about their wealth, confidently slam the board with their game piece as they made their moves, and even consume more of the provided table snacks as they played^[26].

Even more surprisingly, when the players were quizzed after the game as to how the game went, the player endowed with the obvious advantages would talk disproportionately about their own skills in playing the game, and how they deserved the victory due to the better strategy of their moves.

Piff has contributed many other studies to the perceptions of the wealthy individual when compared to the poor. In a 2012 paper, a group of seven studies revealed that upper-class individuals were more likely to break the law while driving (including refusing to stop for pedestrians), to exhibit unethical decision-making tendencies, to take valued goods from others, to lie in a negotiation, to cheat to increase their chances of winning a small prize, and to personally endorse unethical behaviour in the workplace^[27].

Piff's research is perhaps somewhat shocking in the extent that it reveals how transient human behaviours are in relation to economic circumstances. In the case of many of his studies, the economic advantage which is bestowed upon a subject may be an utterly meaningless, temporary appointment (for example in the rigged games of Monopoly) and yet still deliver the same results as if the subject has lived their entire life with genuine economic privilege.

Violence and Crime

Behaviour is also affected by income inequality in more insidious ways. A study of violent crime across six high crime and six low crime nations by Jerome Neapolitan^[28] found income inequality to be the most consistent predictor of levels of violent crime. This finding also holds consistently well within nations. Daly et al. 2001 showed that within individual regions of the United States and Canada, income inequality contributed as much as half of the variability in lethal violence, and could be considered the primary determinant in the difference between the two countries' homicide rates^[29]. The relationship is shown in Figure 1.8-9.

Why is this so? Dr Richard Wilkinson attributes the correlation of violence with a wider statistical trend of poorer social cohesion in less egalitarian communities:

"The relation between violence and inequality appears to be part of a more general tendency for the quality of social relationships to be less good in more unequal societies. As well as more violence, people in more unequal societies tend to trust each other less and are less likely to be involved in community life. There are lower levels of social capital; hostility levels seem to be higher and there is almost certainly more discrimination against minorities and against women."^[30]

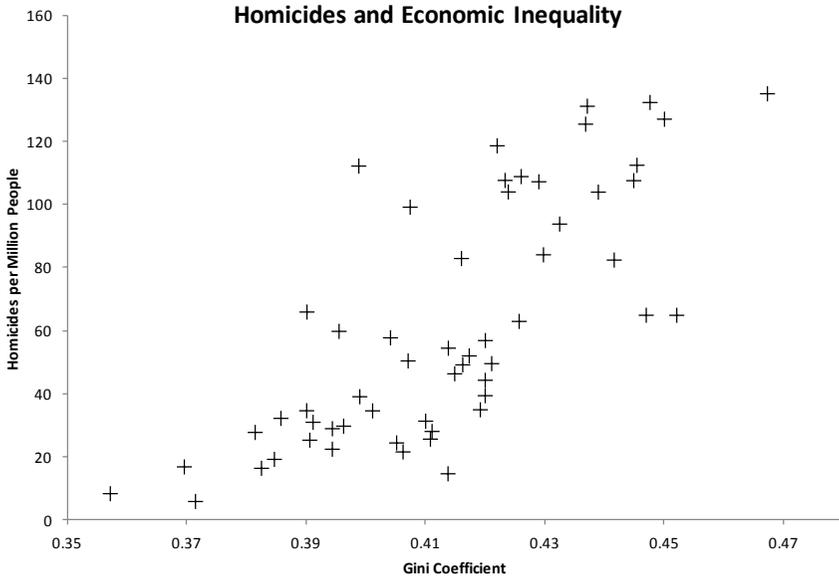


Figure 1.8-9: Plot of Gini coefficient (measure of income inequality) vs. Homicides per million people. Adapted by author from [29]

This concept of the poor social relationship has subtle yet profound interpersonal consequences. As we have observed previously through the work of Paul Piff, heightened inequality can instill a sense of arrogance and swagger in the privileged, leading them to act disrespectfully, unempathetically or immorally. While this heightened air of arrogance may seem trivial in the scope of violent crime, the extent to which violence can escalate from such scenarios is well documented, both empirically and scientifically.

In his writings about hardships as a young African American amid the violent street culture of Virginia, author Nathan McCall recalled that:

“Some of the most brutal battles I saw in the streets stemmed from seemingly petty stuff... But the underlying issue was always respect.”^[31]

Within prisons, the socially corrosive phenomena of disrespect within a hierarchy is even more pronounced. Before his appointment as Director of the Centre for the Study of Violence at Harvard, James Gilligan spent more than 25 years as a prison psychiatrist dealing with violent and homicidal offenders. He writes:

"...prison inmates ... have told me repeatedly, when I asked them why they had assaulted someone, that it was because 'he disrespected me', or 'he disrespected my visit' (meaning 'visitor'). The word 'disrespect' is so central in the vocabulary, moral value system, and psychodynamics of these chronically violent men that they have abbreviated it into the slang term, 'he dis'ed me' [...]"

"I have yet to see a serious act of violence that was not provoked by the experience of feeling shamed and humiliated, disrespected and ridiculed, and that did not represent the attempt to prevent or undo this "loss of face" - no matter how severe the punishment..." ^[32]

The interconnectivity between violence and inequality is a complex topic, but the overarching point to take away is that increasing economic inequality can have a profound and disproportionate effect on violent crime. As Dr Richard Wilkinson further argues, this effect is not a false comparison between a utopian, egalitarian state and a harsh, hierarchical meritocracy; the relatively small differences in income equality observed between various market economies lead to vastly different rates of crime. Even small differences are important.

Addiction

Violence is not the sole socially undesirable trait that is correlated strongly with inequality; indeed, there are a plethora of negative social trends which correlate surprisingly with differences in incomes. Addiction and dependence upon drugs and alcohol is just one of these phenomena.

As with the issues relating to violence, the concept of disrespect figures highly in the propensity toward drug addiction. Baer, Singer & Susser in their 2003 book on medical anthropology proposed a model in which continual experiences of classism and oppression fuelled low self esteem in low income populations, and contributed to feelings of immobility within the social hierarchy. The sense of social immobility, disrespect and oppression imparts a stress on the individual in these circumstances, a stress which subsequently can be self-medicated by usage of drugs or alcohol^[33].

Empirical data generally seems to agree with this concept. A World Health Organisation Study in 2003 found that:

"Drug use is both a response to social breakdown and an important factor in worsening the inequalities of health. It offers users a mirage

of escape from adversity and stress, but only makes their problems worse."^[34]

The study further presented data that demonstrated the smooth correlation of addiction to tobacco, alcohol and other drugs across socioeconomic groups, with the statistical probability of dependence upon these substances increasing in line with economic deprivation (Figure 1.8-10).

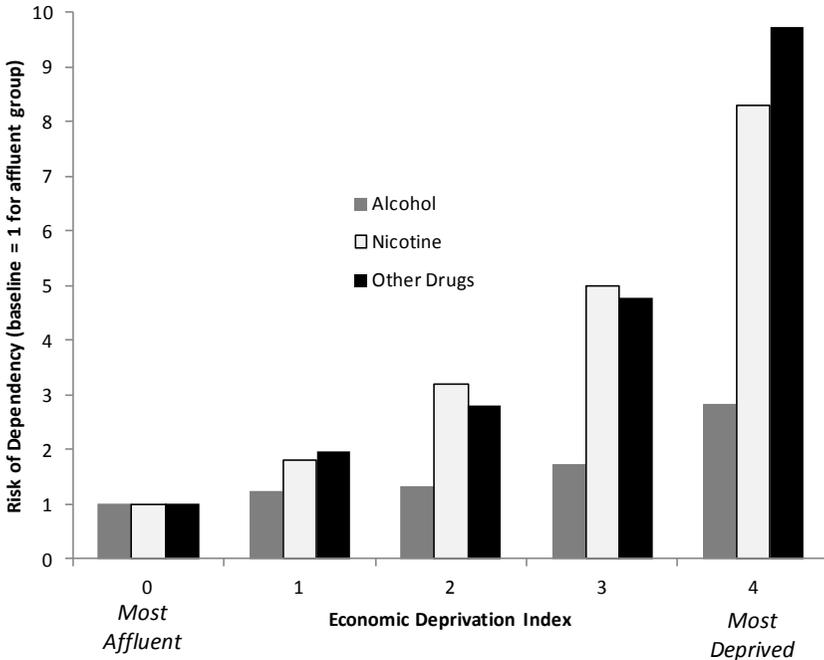


Figure 1.8-10: Plot of risks of dependency upon alcohol, nicotine and other drugs as arranged by social class - Adapted by author from [34]

This general observation has been reproduced elsewhere. A study into alcohol usage by Demers and Kairouz (2003), analyzing 1993 and 1998 surveys of adults in Québec, Canada used an indicator of “income adequacy” derived from household income and size to assess the relationship with alcohol consumption across social classes. The frequency at which participants engaged in heavy drinking sessions showed essentially no correlation with social class, while on the other hand, high-risk weekly drinking and overall volume of drinking showed a significant positive relationship with social class, and frequency of casual drinking an even stronger one^[35].

For deaths related to substance abuse, the effects of different components of low social class may be additive, as found in a detailed study of 21,922 deaths in Finland 1987-1995, for which an alcohol-specific condition was specified on the death certificate. Both for males and for females, the study found significantly higher odds of alcohol related mortality for those of lower education, lower occupational status (in general), lower personal income, lower household net income, and living in rented or other housing (in contrast to owning their own)^[36].

A further study by Sir Michael Marmot, Professor of Epidemiology and Public Health at University College London, found that in the United Kingdom, not only is there a clear inverse association between socio-economic position and consumption of cigarettes, but those in lower socioeconomic groups are significantly less inclined to quit when exposed to health warnings and anti-smoking advertisements^[37].

The reliance of a society upon drugs however is not solely related to the stratification within that society, but also the degree of stratification. The poor are more likely to use drugs than the rich, but they are also more likely to use drugs in societies where the relationship between rich and poor is more unequal. Counter-intuitively, the rich also suffer in this scenario. The rich within a more unequal society also consume more illegal substances when compared to the rich within more equal societies.

Vanity Fair released a piece in May 2014 describing how the super-rich within society can suffer from a psychological issue known as 'perfection vanity' in which not owning or indulging in the absolute best that money can possibly buy, infers a sense of status anxiety. At its most flagrant, this anxiety is what leads to the purchase of a \$20 million Van Dyck self portrait by Petra Ecclestone, the 25-year-old daughter of Formula One figurehead Bernie Ecclestone. Yet this desire to pay for items which confer absolute status also extends into substances. Petra Ecclestone and her husband are also connoisseurs of Château Pétrus champagne, which frequently summon prices as exorbitant as \$6000 per bottle^[38].

National Geographic have also researched this tendency among the rich to consume expensive substances. Their research led them to a secretive, pseudonymous New York drug dealer, 'Mr Fence', who charges thousands of dollars per transaction for bespoke, high quality drugs, delivered on demand to Manhattan banking moguls and upper socialites^[39].

This enhanced view of status within an unequal society can however just as well be a crushing burden, rather than a green flag for hedonism. Parables abound surrounding the heirs of the super-rich who are born into a family that infers their superiority above others, but instead sees them struggle to find their way in life, and collapse into a spiral of shame and self destruction.

Hans K. Rausing and wife Eva, inherited a vast, billion dollar fortune from the invention of the Tetra Pak, but both succumbed to Class A drug addiction that would eventually rob Eva of her life. Hans K. Rausing eschewed entering the family business, and instead spent his youth travelling and indulging in substance abuse^[40]. Similarly Jamie Blandford, heir to Blenheim Palace in Oxfordshire, UK and the Dukedom of Marlborough would spend time in prison for forging his own prescriptions related to his own spiral into drug addiction^[41].

Perhaps one of the most tragic downfalls of this sort is John Hervey, Marquess of Bristol, who became the master of thousands of acres in East Anglia when he was just 21.

"By any standards, Bristol's squandering of his inheritance was extraordinary. It was said that after he died, the family seat of Ickworth in Suffolk had to be replumbed because there were so many syringes stuck in the pipes. He spent an estimated £7 million on drugs and died aged 44."^[42]

These illustrations are not intended to argue that the super-rich within a society are necessarily predetermined to follow hedonistic or self-destructive paths in life, but rather to suggest that within unequal societies, the social pressures are much more forceful to encourage such behaviour.

Genetic predispositions for addiction are a powerful marker for who will succumb to their vices, but the increased pressure surrounding social standing can act to exacerbate the epigenetic characteristics of addiction. As such, those at the bottom of a more unequal society are placed under more stress due to their lack of social mobility, while those at the top are placed under a burden to endlessly attain perfection, or to uphold a burdensome concept of familial dynastic legacy.

What is particularly pertinent here is that arguments in defence of economic inequality are made almost exclusively by the super rich, despite the fact that inequality harms them in less salient, but equally important ways. As we discussed in chapter 1.7, political investment is frequently used to push

legislation that furthers the ascendancy of the super rich, at the expense of accelerating inequality. This is clearly a false messiah for those at the top of the pyramid.

We must however consider that ideologically driven political investment is not the only mechanism that leads to inequality. Economic inequality is in many ways fundamental to the concept of the market incentive, and many of the institutions that arise from the market incentive (corporations, banks etc.) have economic inequality hard coded into their structure.

These phenomena are frequently viewed as fundamental trivialities of market capitalism, and are explained away or ignored by the smooth talking neoclassicists. But their mechanisms are no less undiluted or insidious when perused, as will be the topic of the next subsection.

Systemic Instability and Hegemony

Admittedly, it becomes difficult when talking about such intermingled issues to maintain discrete chapters. Casting our minds back to chapter 1.4, we perused the mechanics of modern usury based economics and the ramifications of this type of financing upon the global economy. What however was left out of the chapter was the fundamental mechanism of usury and its effect on income inequality. This will be presented here, as the scope of the chapter is more fitting.

The fundamental principles of usury based economics are viewed as fairly benign at a personal level. To acquire money through a loan, the debtor must agree to pay an interest component in order to compensate the creditor for the risk associated with extending the credit. This is an academic reality to even the most economically uninitiated. On the opposite side of the coin, but equally as obvious, a wealthy individual may find himself with more money than everyday needs demand, thus being able to invest or save. This surplus money may therefore be used to generate even more money through exactly the same interest mechanism.

While it may be unusual to peruse such obvious and transparent phenomena in great detail, the idea of interest warrants further thought. While not commonly considered, the interaction of interest within the monetary system may be viewed as a feedback mechanism. Within science and engineering, it is common to assess feedback systems using simple block diagrams as follows.

Consider an isolated financial actor within an economy, be it an individual or business, the details are unimportant. At any moment in time, a flow of money will be entering the system, via an income. Based upon the operation of this actor, money will also flow out of the system as outgoings. This may be through living costs for an individual, or from the costs associated with the production of a good or service, as with a corporation or business. The basic block model is shown below.

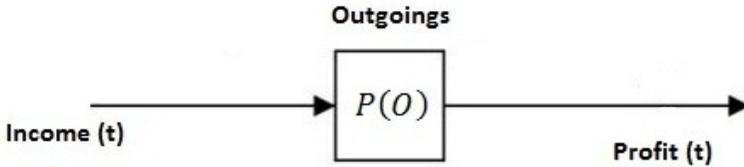


Figure 1.8-11: Basic block diagram for economic actor - Income, Outgoings, Profits

You may have noticed that the diagram includes an additional 'profit' arrow. In classical block diagram terminology, this flow of money may be called the 'error'. In reality it stems from what money is remaining after the outgoings have been subtracted from the income. Note this calling this value the error is strictly terminological; it is not suggesting that an actor should aim to have an income which is perfectly equal to outgoings. Also note that the error may either be positive or negative; in the case of a positive error, excess money is remaining after all costs have been met. For a negative error, a deficit has developed whereby the outgoings outstrip income. With this in mind, we may build a more complete example feedback loop.

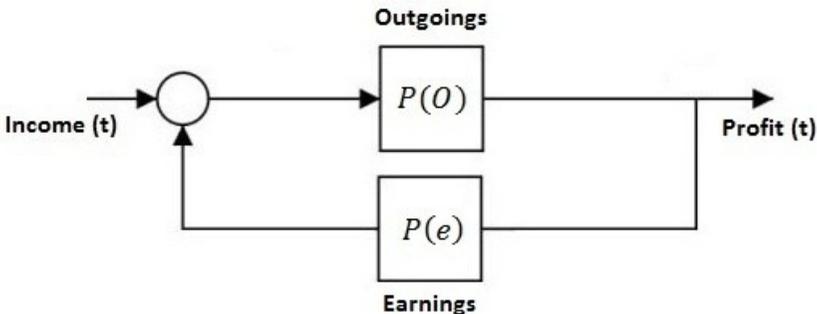


Figure 1.8-12: Basic Block diagram with feedback - Profits or losses loop back to affect future income.

Note that an additional block has been added signifying the interest either accrued upon the savings or investment, or the interest charged for loaning money to recoup a deficit. In both cases the interest magnifies the error significantly. Assuming a constant operating cost, an actor finding themselves with a surplus may invest or save money, thus adding to their income and allowing more money to be saved. Conversely, an actor seeing a deficit must go into debt to cover the shortfall, attracting interest payments which further reduce the income relative to outgoings.

When drawing the actual diagram, this system of interest represents a classic positive feedback loop; the hallmark of an unstable system. For illustration, one of my old university professors equated a stable system to holding a ball in a basket, and an unstable system akin to balancing a ball on the tip of a pin. In the first case, disturbing the system results in the system naturally returning to the same equilibrium state (the ball is still at the bottom of the basket), while in the second case a disturbance results in the system rapidly diverging (the ball falling off the tip).

All this analysis however is meaningless if it is not in line with observable phenomena. Does the world really reflect a system which makes the rich richer and the poor poorer, not simply proverbially, but also mathematically? We are certainly not seeing exponentially accelerating wealth and exponentially accelerating poverty as this simple model would suggest. The reality of this mechanism is that, contrary to our assumption of constant operating costs, both individuals and businesses change their costs over time, either of their own volition or through wider economic factors.

Another important factor to consider is taxation, as while the rich are permitted to utilise investments and savings to their advantage, they are (in theory) subject to a greater tax rate upon their incomes. However, we must consider that this is a linear relationship within an exponential system, and while taxing the rich reduces the instability of the system somewhat, only the most vicious of taxation can work to noticeably counteract this inherent structural instability (see Figure 1.8-13).

The same is true at the other end of the spectrum. Numerous social welfare schemes and charitable organisations within market economies may act to reduce the exponentiality of the unstable system, but to remove the effect entirely is a different request.

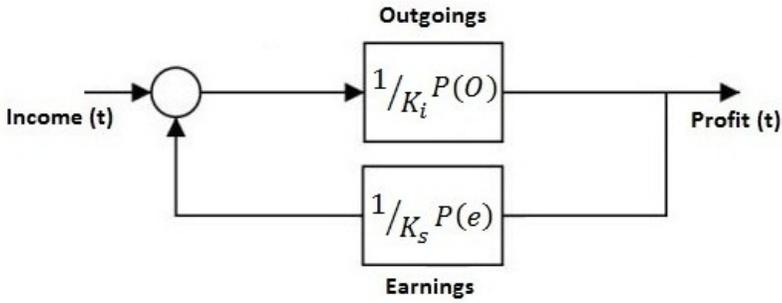


Figure 1.8-13: Basic block model with feedback and tax constant (K) - Both incomes and invested profits are subject to a linear factor in line with the tax system.

Some aspects of the state may therefore be seen to moderate the inherent instability of the system, while others (such as political investment by the business classes) act as an additional arm by which the instability is exacerbated. This is largely in line with reality; during periods where state policy is centred upon business deregulation, economic inequality is observed to drastically accelerate (see Figure 1.8-14). When state regulation is removed, the inherent unstable prerogative of debt-backed finance is less constricted, and large scale collapse - the ball falling off the pin - becomes more likely.

Political investment in the state is subject to similar dynamics. It is prudent to visualise this kind of investment as any other; surplus capital is invested into a third party (the political structure) in order to acquire a return on investment (favourable policy and preferential treatment). The larger the amount of surplus capital, the more significant the possible return - this is fully in line with the unstable system model described previously.

Unionisation of the working classes can be viewed approximately as a system put in place to challenge this inherent instability, as it aggregates the capital of the workers to invest against the political investors of the business class. This is also largely in keeping with what we see in society, with deunionisation correlating with rising inequality, as the latent instability of the system is unfurled^[44].

US Income Inequality and Banking Stability 1864-2008

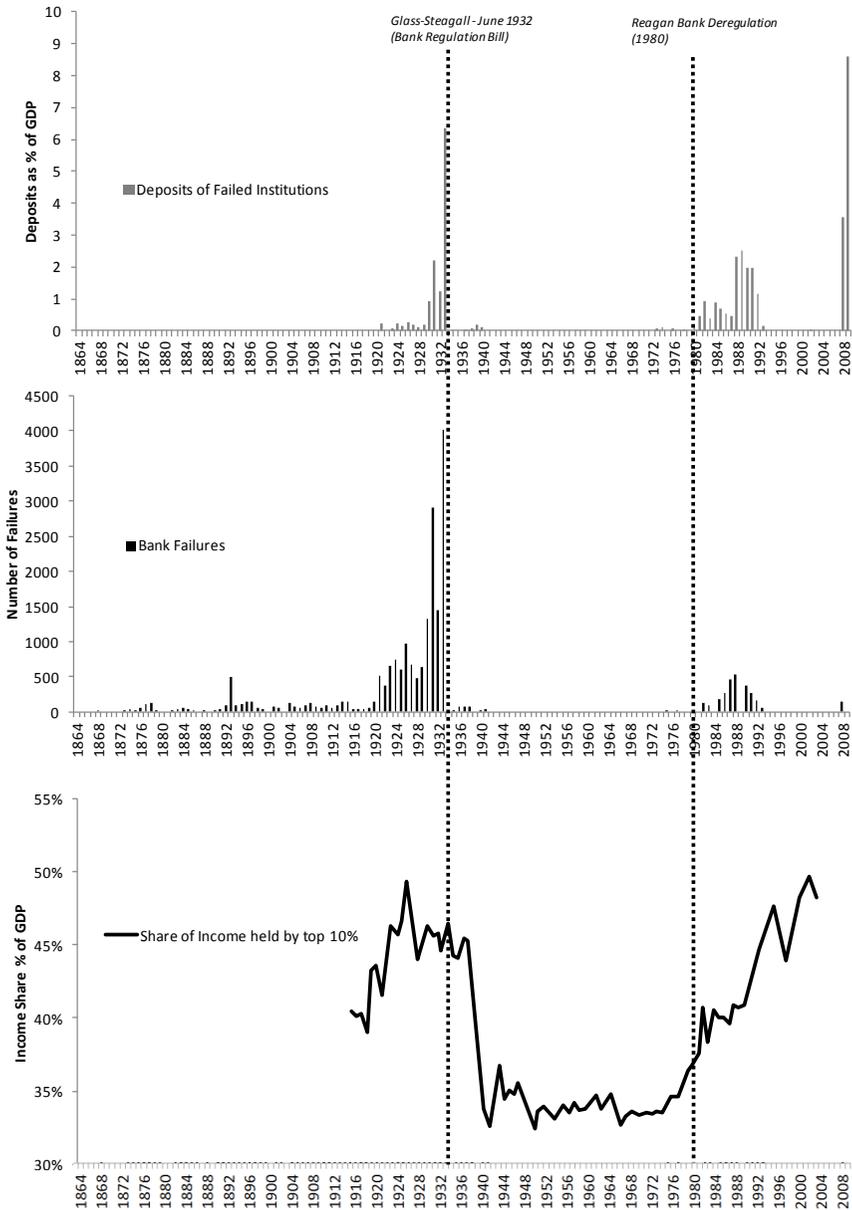


Figure 1.8-14: Large scope stability analysis of U.S. economy - Inequality, regulations (including tax) and bank failures all correlate - This observation is in line with the idealisation of the interest system as an unstable system, which is reigned in by a regulatory control system - Adapted by author from [43]

The fundamentals of the interest system within usury based economics are demonstrably in conflict with any ideal of equal opportunity. While attempts are made through taxation and other governmental schemes to reduce this effect (wittingly or unwittingly), the ideas are diametrically opposed. Filmmaker and social philosopher Peter Joseph has come to call this attribute of the modern economy ‘structural classism’^[45]. It is certainly a term which does not pull any punches.

It is therefore demonstrable that the interest system as a whole acts to reinforce social classism and cultural hegemony far more than it may ever be considered to reduce it. The upshot of this is that in order to attain a society which is readily in keeping with equal opportunity and egalitarianism, significant monetary and market reform is absolutely mandatory.

The Fallacies of Equality

At this point in the chapter, it seems fairly clear as to the ramifications of economic inequality within a society. Further to this, an increasing swathe of the public are aware of the issue, with 60% of Americans recently polling positively for a proposal to tax high earners. Counter-intuitively, even the richest among society are reasonably supportive of such a plan, with 64% of American millionaires also supporting higher taxes among the rich (although this number is likely to be lower than quoted)^[46].

So how can those who defend inequality, do so when the effects seem so overwhelmingly negative, and support for reform is so bolstered? What arguments do they present to justify their position?

The attempts at repudiation by supporters of inequality tend to come under three broad banners; the meritocratic argument, the stimulus argument and the excellence argument, the latter of which, we will discuss presently;

The argument from excellence is the most audacious straw man of the three arguments, as it fundamentally misrepresents equality of opportunity as equality of outcome. Within this argument, the assumption stands that the egalitarian society quashes excellence in favour of a sameness across the board. All actors within the economy are encouraged and rewarded equally for their deeds, regardless of how well they may perform. This results in a society were those who underperform are encouraged more than they may merit, and those who overperform are undersold in relation to their skills.

In Quentin Letts' comedic deconstructive book, *Bog-Standard Britain*, Letts structures his entire polemic around this conceptual straw man, arguing that stratified society is what made Britain great, and that equalism has dumbed society down into a blathering husk^[47]. But is this argument true? Do societies with less income inequality foster mediocrity, and perform worse than their more stratified neighbours?

In a January 2014 study by Jonathan Hopkin, Victor Lapuente and Lovisa Moller of the London School of Economics, the effect of income inequality on technical and scientific innovation in a country was assessed. The findings were, in most cases, the polar opposite to that which free market apologists would suggest. Figure 1.8-15 shows that there is in fact a correlative relationship between high innovation and low inequality, with the USA being one of a few outliers^[48].

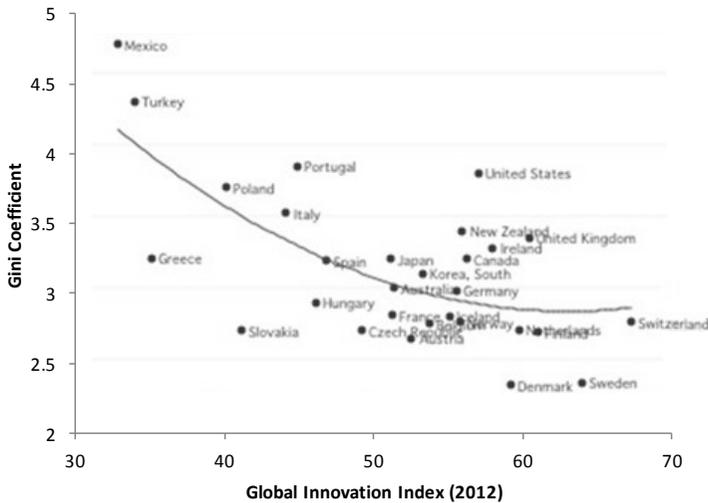


Figure 1.8-15: Correlation of Gini coefficient (measure of economic inequality) vs. Innovation index for various developed nations - Adapted by author from [48].

Even the possibility that more egalitarian countries ride on the coat tails of more stratified countries was shown to have little grounding in reality:

"The U.S. combines high inequality with excellent universities financed by both public and private funds, and a regulatory environment that encourages innovation. 'Cuddly capitalist' countries that invest in research, have good universities and quality regulation can also innovate, without having to offer successful entrepreneurs outsized

rewards. There seems little evidence for the thesis that egalitarian societies need to freeload off the innovations of the American super-rich in order to prosper.”^[48]

Indeed, as we have seen previously in Richard Wilkinson's work, there are noticeable correlations between unequal societies and many of the 'dumbed-down' phenomena that Letts rails against. Furthermore, this concept of 'excellence' being lost within more egalitarian systems is fundamentally at odds with the educational renaissance which occurred in Finland around 40 years ago. This relatively small Nordic country revitalised its schooling approach in a manner that was practically unheard of in other economies:

“There are no mandated standardized tests in Finland, apart from one exam at the end of students’ senior year in high school. There are no rankings, no comparisons or competition between students, schools or regions. Finland’s schools are publicly funded. The people in the government agencies running them, from national officials to local authorities, are educators, not business people, military leaders or career politicians. Every school has the same national goals and draws from the same pool of university-trained educators. The result is that a Finnish child has a good shot at getting the same quality education no matter whether he or she lives in a rural village or a university town. The differences between weakest and strongest students are the smallest in the world, according to the most recent survey by the Organization for Economic Co-operation and Development (OECD). “Equality is the most important word in Finnish education. All political parties on the right and left agree on this,” said Olli Luukkainen, president of Finland’s powerful teachers union.”^[49]

Upon entering into the global child test score system, PISA, in 2000, Finland rose to become one of the top countries in the world in reading, science and maths, and maintained consistently high scores for many years^[50]. Only recently, with the rise of the Asian nations, has egalitarian Finland slipped down the league table, but the small Nordic nation still consistently outperforms much larger and more competitive nations, such as the USA.

This analysis segues nicely into the second foundational falsehood of pro-inequality; the meritocratic argument. In counterpoint to the belief that egalitarian societies result in a loss of excellence for failing to reward the best and brightest, the meritocratic argument focuses on the not-so-best and not-so-brightest. This posits that without sufficient motivation by way of their

inadequate social standing, the underprivileged will not desire to rise through the ranks of society and will instead rest upon their comfortable egalitarian laurels, thus reaping more than their merit deserves.

In the wake of the American Civil War, Horatio Alger authored well over one hundred books centred upon one overarching trope. The protagonist, born into poverty and destitution, applies himself and works hard, lifting himself out of his previous life and into a prosperous and comfortable middle class existence. Alger's works, and the concept of 'pulling yourself up by the bootstraps' have become quintessential cornerstones of the American dream, positing that with hard work and self reliance, anybody can forge themselves a successful life in the face of adversity^[51].

This myth is ingrained deeply in American society, and has even propagated over the Atlantic to Western Europe to an extent, but none the less remains mythical. Furthermore, it spreads the insidious belief that those who are poor are in their position due to their lack of merit or effort. The data unfortunately does not back this view up. The Hamilton Project, an initiative put forth by the American centrist think tank Brookings, carried out a study into the effects of income disparity on opportunity.

Their findings have emphasised that high income earners within unequal societies are able to bestow much more pronounced benefits upon their children (private education, special tutoring etc.) when compared to poorer families. The study quotes:

"Over the past four decades, families at the top of the income ladder have increased spending in these areas dramatically, from just over \$3,500 to nearly \$9,000 per child per year (in constant 2008 dollars). By comparison, those at the bottom of the income distribution have increased their spending since the early 1970s from less than \$850 to about \$1,300. The difference is still stark: high-income families have gone from spending slightly more than four times as much as low-income families to nearly seven times more."^[52]

Figure 1.8-16 and Figure 1.8-17 act to reinforce this argument, showing that unequal societies are typically more rigid in terms of social mobility, rather than being conducive of meritocratic impetus. In particular, rising inequality in the USA has led to a consistent widening of the achievement gap between rich and poor children, rather than encouraging poor children to strive for greatness.



Figure 1.8-16: Index of social mobility plotted against in income inequality index - More unequal countries observe more rigidity in the social hierarchy (i.e. those born poor are statistically more likely to remain poor) - Adapted by author from [52]

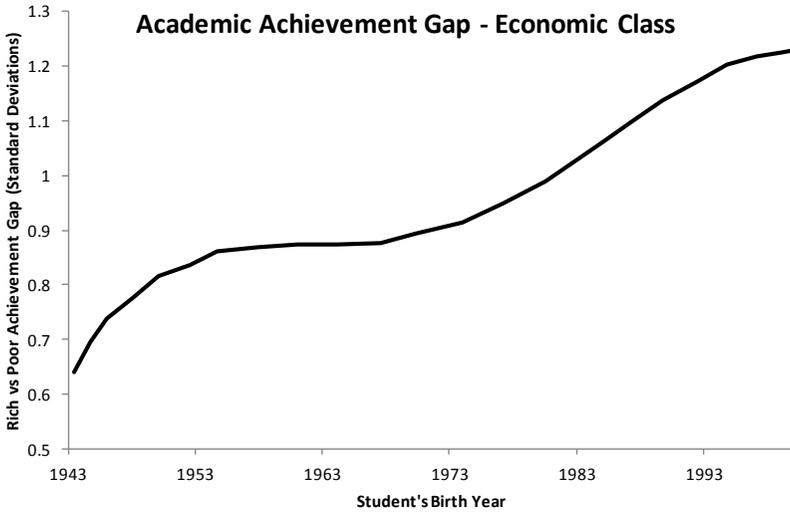


Figure 1.8-17: Plot of the US. academic achievement gap between rich and poor children - Note that the gap has risen with in creasing income ine quality - Adapted by author from [52]

Other outlets are more sanguine and cautious on the matter. A detailed Stanford study holds that a 'rigidification' of intergenerational income relationships has been observed, and the *"takeoff [of income inequality] may be implicated"* but no solid conclusions are possible at this point^[53]. Other studies insist that social mobility in the USA has been relatively steady over the last several decades, in the face of rising inequality^[54].

To whatever extent of the relationship between inequality and social mobility, what is clear is that Alger's parables cannot be used as justification for a highly economically stratified society. At best, this kind of society has no advantage over a more egalitarian nation in terms of mobility, at worst, it significantly harms it.

The third, and by far the most ludicrous argument used to defend inequality, is the concept that the upper economic tier of society represents the engine of prosperity for the rest of the nation. As we have discussed in chapter 1.7, American media institutions have frequently described the top earners as 'job creators', painting them as champions who's businesses forge new careers for the middle classes.

While this has been shown as a clear, cynical act of doublespeak by political investors, this general arc of argument has been used with some gravity throughout the political system to justify highly unequal circumstances. Paul Ryan, U.S congressman and Chairman of the House Budget Committee has been among the most strident in his dedication to this ideological totem.

"The other thing, in the tax side is permanent tax increases on job creators doesn't work to grow the economy. It's actually fuelling the uncertainty that is hurting job growth right now. And don't forget the fact that most small businesses file taxes as individuals. So, when you are raising these top tax rates, you're raising taxes on these job creators where more than half of Americans get their jobs from in this country."^[55]

Unfortunately for Ryan, his argument is blissfully easy to disprove. Figure 1.8-18 shows the relationship between top bracket income tax rates and the net change in the amount of added jobs per month. There is clearly no simple correlation between the job market and the rate at which the top earners are taxed, as job growth tends to vary around a reasonably stable constant. Furthermore, with the magnitude by which U.S. inequality has risen over time

shown in Figure 1.8-6, we may also draw the conclusion that a wider inequality beyond the top earners is also largely ineffectual toward the job market.

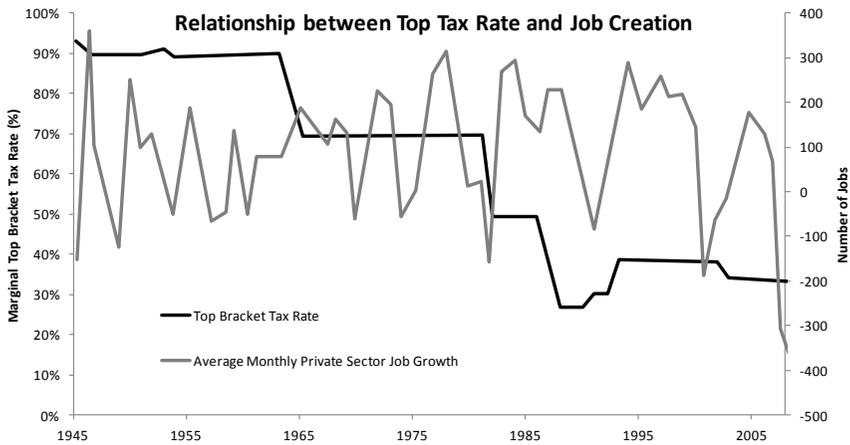


Figure 1.8-18: Variations in job growth (number of jobs 'created' per month) and top tier tax rate - USA 1945 - 2008 - Adapted by author from [56]

With this in our stead, there does not seem to be any sound argument which can be used to justify a state of significant income inequality. Conversely, as we have seen, there are a plethora of social issues which are exacerbated by increasing inequality. With a greater understanding, we must invariably return to the crux of this section of the book, and peruse the actual dynamic between the market incentive system and the phenomenon of economic inequality, and whether this dynamic is positive.

Causality - Is The Market Really to Blame?

By playing the game of advocatus diaboli, we inevitably must tread carefully as to how we attribute the trend of inequality; either to an overarching set of market values, or as some perversion of such. As the classic view of society naively stipulates, the market and state are separate entities which each enforce their own set of values upon the population; the market with its transcendent efficiency, and the state with its democratic idealism. However, our more pragmatic assessment (chapter 1.7) of the interaction between these institutions shows that their behaviour is much more circular, reflexive and chaotic.

The correlation between the deregulation of the U.S. financial markets and the rise in inequality (shown in Figure 1.8-14) is certainly telling as to the effect of the market, but we must be careful, as the USA is just one market of many. International trade liberalisation and deregulation generates a freer flow of

capital between nations across all markets. It is therefore more suitable to assess the system at a global level, if any tentative conclusions are to be drawn. A 2001 study by the American Economic Policy Institute found that:

"The connection between rapid trade liberalization and inequality appears to be universal, indicating downward wage pressures and rising inequality following trade liberalization in industrializing and industrialized economies"^[57]

The study goes on to conclude the effects of lowering barriers to globalisation:

"Criticism of the unregulated globalization agenda has been met with policy makers' renewed adherence to the doctrine that greater global deregulation of trade and capital flows helps to improve inequality between countries, to raise equality within countries, and to accelerate poverty reduction. But income distribution between countries worsened in the 1980s, and its apparent improvement (or leveling off) in the 1990s is the result solely of rising per capita income in China, where the enormous population tends to distort world averages. Within-country income inequality is also growing and is a widespread trend in countries with both advanced and developing economies."^[57]

There is indeed convincing correlation between state regulation leniency, and tides of rising inequality, but can we realistically argue that the market incentive itself is to blame in this? Conversely, we must not rule out the possibility that the presence of the state acts as a reinforcement to economic inequality.

Taxation of the populace is one of the most fundamental factors which contributes to income inequality, and a government's policy to apply lenient taxes to top earners and large businesses can have profound effects. Similarly, action taken by a state to grant lucrative contracts to oligopolic business interests can certainly be viewed as conferring a substantial advantage to those who are already successful.

However, through Ferguson's investment theory of political competition (see the previous chapter), the state can concisely be viewed as capital into which businesses and private interests invest, in order to see a return on their investment. Of course, investments carry risk, and political investment does not guarantee a sweeping raft of beneficial policies, but it none the less functions at the same level, as it grants the possibility of such.

As soon as this concession is made, we find ourselves back at our model of the process of investment as an unstable system. The more capital an economic actor possesses, the more they can invest, and hence the more capital they can acquire. Favourable governmental policy is capital, as much as machinery or land, as it grants actors within the economy a greater ability to generate profits.

State policy is therefore simply an imperfect reflection of wider investment trends, and more tellingly, a reflection of the marketplace itself; the two phenomena are intrinsically interlinked. While the state undoubtedly plays a role in the proliferation of income inequality, we must view the system as a more complex combination of prerogatives, under which both private business and government coexist.

It is clear that the banal tact of anti-state, pro-market apologetics is at best superficial, but what is perhaps more interesting is what the actual free-market economists and philosophers feel about economic inequality itself.

The home of free-market philosophy is unquestionably modern libertarianism, and this ideology has understandably crossed swords with the concept of inequality in the past. The responses are generally mixed, ranging from sweeping inequality aside as an irrelevancy, to downplaying the actual levels of inequality within capitalist societies.

Of the more interesting responses to income inequality from free market thinkers, renowned economist Milton Friedman is perhaps the strangest case. As assessed by Julio H. Cole, Professor of Economics at Universidad Francisco Marroquín:

"Friedman's views on income inequality are most clearly stated in Capitalism and Freedom (1962) and in Free to Choose (1980), his two major popular books. In both works, he starts out by arguing that we should indeed be unconcerned about income inequality in a free-market economy, and he provides three major reasons: (1) Some degree of inequality is actually desirable in any well-functioning economic system; (2) in any case, a certain degree of inequality is unavoidable under an economic system based on free-market principles; and (3) the actual degree of income inequality in observed market economies, such as the United States, is much less than is commonly assumed (especially when compared to income distributions in nonmarket economies)."^[58]

Friedman's arguments here are generally par for the course in prima facie market apologetics; argument (1) is a conflation of equality in opportunity and outcome, and argument (3) is an bare faced dismissal of the ascendant inequality in market capitalist countries such as the USA*. Argument (2) however is of particular interest and importance to this analysis, as not only is it an example of a prominent economist insisting that inequality is 'unavoidable' in a free market economy, but it is also clear that this particular line of reasoning caused Friedman some personal moralistic discomfort.

This feeling of unease around poverty within capitalist countries led Friedman to concede that a degree of 'compulsory state action' may be necessary to enable the community to achieve their 'common objective'.

"He [the individual] will regard private charity directed at helping the less fortunate as an example of the proper use of freedom. And he may approve state action toward ameliorating poverty as a more effective way in which the great bulk of the community can achieve a common objective. He will do so with regret, however, at having to substitute compulsory for voluntary action."^[59]

This is of course a fairly cataclysmic admission, that the free market economy leads to 'unavoidable' inequality which requires 'charity' and 'state action' to properly remedy. Furthermore, it opens the gates to a whole cavalcade of logical problems as how to ensure that the state carries out such action in a just and fair manner, devoid of cronyism and political investment. Indeed, Friedman's stance on this led to many of his peers to ostracise him from their ideological clique, most notably, Murray Rothbard; *"it is difficult to consider [Friedman] a free-market economist at all."*^[60]

But free-market philosophy is further fractured by the seeming tendency for their economies to promote inequality that is damaging to social welfare in the manners that we have seen. Vast tomes have been compiled attempting to reconcile the underlying individualist, ownership based prerogatives of free-market principles and libertarianism, with the long intuitively observed social benefits of egalitarianism.

* *When faced with this, free market proponents will frequently draw on the No True Scotsman fallacy, claiming that such unequal countries are polluted by cronyism, and hence not true free markets (this line of apologetics has already been tackled in chapter 1.7 - However, perhaps here we should give Friedman the benefit of the doubt, as at his time of writing, inequality was not as pronounced as today.*

One such of these philosophical tomes is *Libertarianism Without Inequality*, written in 2003 by Michael Otsuka. Within his work, Otsuka observes that the raw materials and land which constitute the private property of individuals is previously unowned. From this, Otsuka argues that an unwritten social contract exists, which demands that these worldly resources may be granted as private property, on condition that a proportion of the benefits are used for the betterment of society. In his own words:

"If the farmer had voluntarily purchased the land she farms from someone on the condition that she give half of her harvest to the needy, then the state would do no wrong by stepping in to force her to give this portion away to the needy. Such force would infringe no property right of the farmer's. Rather, it would be a justifiable means of enforcing a voluntary contractual obligation. Now suppose that it were more generally the case that we could come to legitimately own any bit of land or other worldly resource only on the condition that we share some of whatever we reap from it with others. If this were true, then the state's forcing each of us to share our harvest with others would be no more an infringement of self-ownership than in the previous case involving the enforcement of a contractual obligation."^[61]

By arguing this, Otsuka invokes a pseudo-state as an arbiter of the initially unowned worldly resources, by which all individuals voluntarily accept based upon their wider respect for the social contract. This is of course problematic, as the solution is fundamentally statist, and subject to the same pitfalls as any statist ideology might suffer.

Furthermore, Otsuka does not argue that the free market principles that flow from libertarian theory are in fact logically consistent with an egalitarian society. He instead creates an argument by which a redistributive state-type institution can be invoked through libertarian principles, i.e. an institution which regulates the marketplace is still needed. This is deeply troublesome within free-market theory.

Needless to say, Otsuka has met stiff criticism from other free-market thinkers for his arguments. Risse 2003 was strident in his takedown of Otsuka, summarising the more traditional libertarian Robert Nozick's views:

"Nozick's Lockean Proviso: You may acquire previously unowned land (and its fruits) if and only if you make nobody else worse off than they would have been in the state of nature in which no land is privately

held but each is free to gather and consume food and water from the land and make use of it" [62]

In counterpoint to Otsuka's:

"Otsuka's Egalitarian Proviso: You may acquire previously unowned worldly resources if and only if you leave enough so that everyone else can acquire an equally advantageous share of unowned worldly resources." [62]

Risse instead argues that inequality within a free market economy is a phenomenon which we should be ultimately ambivalent toward :

"But why should we care about placing people at such a disadvantage? The question arises for Nozick's proviso, but so much more for Otsuka's, which is a substantial strengthening. Kirzner and Rothbard have no qualms about placing anybody at such a disadvantage, insisting that nobody is entitled to not being so placed." [62]

Risse goes on to argue that the fundamental idea of attempting to balance egalitarian distribution of resources with the free-market principles of self ownership is incoherent at a principle level:

"I think it is coherence for which we should be (and I think most of us are) aiming when we, as philosophers rather than as politicians trying to hold together a coalition government, inquire about the viability of an approach. At the same time, incoherence at the level of principles is inconsistency at the level of reasons. It is at that level that left-libertarianism is in trouble – or at any rate, the challenge for left-libertarians is now to make it plausible how anybody could coherently endorse some principle of egalitarian ownership of external resources and a libertarian principle of self-ownership; that is, to explain why anybody should want to be a left-libertarian." [62]

Similar arguments amongst libertarian thinkers have erupted across the spectrum of debate, but what does this actually mean in the context of the market's role in inequality? Libertarians attempt to bat away the concept of inequality by either gymnastically invoking some state-type institution to manage the market's inherent instability (Otsuka, Friedman etc.) or arguing that inequality is perfectly fine (Rothbard). The latter argument is patently untrue, and the former argument subjects itself to the pitfalls of the previous chapter's analysis.

Why would these arguments be necessary if the market was indeed a self regulating, spontaneously ordered system? It is clear that even for those most fervent in their support for the market, the writing has been on the wall for some time; the market, and economic inequality are intrinsically interlinked.

Conclusions

It should now be somewhat of a formality that economic inequality is a negative attribute within a society, and that both rich and poor within those societies suffer at its behest. Evidence for this is now ample, and seemingly growing year by year as our understanding of human psychology improves.

Similarly, it is a struggle to apportion the majority of responsibility for economic inequality on anything other than the market incentive system. Anti-state apologetics may appear correct at the face of it, but they overlook the intricate relationship between market and government.

Furthermore, free-market proponents have an insurmountable task ahead of them to convince anybody otherwise, given that; deregulation and inequality are so tightly correlated on national and international scales; the functionality of investment and interest are intrinsically hegemonic and unstable; and, even some of the most prominent free market thinkers struggle to grapple with the concept of inequality.

Chapter 1.8 - References and Notes

- [1]. *More or less equal?* The Economist, Mar 11th 2004 - <http://www.economist.com/node/2498851>
- [2]. *Ibid*
- [3]. Engelbert Stockhammer, *Rising Inequality As A Root Cause Of The Present Crisis*, Political Economy Research Institute, April 2012
- [4]. *Humanity Divided: Confronting Inequality in Developing Countries*, United Nations Development Programme, November 2013, pg 3
- [5]. *Voices Of The Poor In The Current Crises*, Institute Of Development Studies, Issue 07, Policy Responses To The Global Financial Crisis, March 2009
- [6]. *Even it up: Time to End Extreme Inequality*, OXFAM, pg 32
- [7]. Credit Suisse Research Institute, *Global Wealth Report 2014*, pp24-27
- [8]. *Ibid*
- [9]. Data taken from OECD - <http://www.oecd.org/social/inequality.htm>
- [10]. *An Overview of Growing Income Inequalities in OECD Countries: Main Findings*, OECD 2011, pg 25
- [11]. Engelbert Stockhammer, *Why have wage shares fallen? A panel analysis of the determinants of functional income distribution*, Conditions of Work and Employment Series No. 35, International Labour Office, Geneva, 2013
- [12]. Rich Morin, *Rising Share of Americans See Conflict Between Rich and Poor*, Pew Research Center, January 11, 2012, <http://www.pewsocialtrends.org/2012/01/11/rising-share-of-americans-see-conflict-between-rich-and-poor/>
- [13]. Joseph Stiglitz, *The Great Divide: Unequal Societies and What We Can Do About Them*, W. W. Norton & Company; 1 edition (April 20, 2015)
- [14]. Andreu Mas-Colell, Michael D. Whinston, Jerry R. Green, *Microeconomic Theory*, Oxford University Press; 1 edition (June 15, 1995) pg 117- Some additional insight is taken from: Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pg 59
- [15]. Kate Pickett, Richard Wilkinson, *The Spirit Level: Why Equality is Better for Everyone*, Penguin (4 Nov. 2010)

- [16]. Madsen Hø, Dam H, Hageman I., *More than every tenth person have symptoms of seasonal affective disorder*, Ugeskr Laeger. 2011 Nov 21;173(47):3013-6
- [17]. Christopher John Snowden, *The Spirit Level Delusion: Fact-Checking the Left's New Theory of Everything*, Democracy Institute/Little Dice (17 May 2010)
- [18]. *Democracy Institute adjunct scholar Christopher Snowden's new book*, Democracy Institute, 28-May-2010
- [19]. Evian Gordon, *NeuroLeadership and Integrative Neuroscience*; NeuroLeadership journal issue 1, 2008
- [20]. Hidehiko Takahashi et al, *When Your Gain Is My Pain and Your Pain Is My Gain: Neural Correlates of Envy and Schadenfreude*, Science 323, 937 (2009)
- [21]. David Rock, *Managing With the Brain in Mind*, Strategy and Business, Issue 56, Autumn 2009
- [22]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pg 131
- [23]. Hidehiko Takahashi et al, *When Your Gain Is My Pain and Your Pain Is My Gain: Neural Correlates of Envy and Schadenfreude*, Science 323, 937 (2009)
- [24]. Agnes Naim and Ipsos MORI Social Research Institute, *Children's Well-being in UK, Sweden and Spain: The Role of Inequality and Materialism*, UNICEF, June 2011, pg 57
- [25]. Michael W. Kraus, Paul K. Piff, Dacher Keltner, *Social Class as Culture: The Convergence of Resources and Rank in the Social Realm*, Current Directions in Psychological Science, August 2011 vol. 20 no. 4 246-250
- [26]. Lisa Miller, *The Money-Empathy Gap*, New York Magazine, 1 Jul 2012 - <http://nymag.com/news/features/money-brain-2012-7/>
- [27]. Paul Piff et al, *Higher social class predicts increased unethical behavior*, PNAS March 13, 2012 vol. 109 no. 11 4086-4091
- [28]. Jerome L Neapolitan, *A comparative analysis of nations with low and high levels of violent crime*, Journal of Criminal Justice, Volume 27, Issue 3, May–June 1999, Pages 259–274
- [29]. Martin Daly, Margo Wilson, Shawn Vasdev, *Income Inequality and Homicide Rates in Canada and the United States*, Canadian Journal of Criminology Volume:43 Issue:2 April 2001 pp219-236
- [30]. R. G. Wilkinson, *The Impact of Inequality: making sick societies healthier*, New Press, N.Y. 2005

- [31]. N. McCall, *Makes me wanna holler: A young black man in America*. Random House, New York. 1994
- [32]. J. Gilligan, *Violence: Our Deadly Epidemic and its Causes*. G.P. Putnam, New York, 1996
- [33]. Hans A. Baer, Merrill Singer, Ida Susser, *Medical Anthropology and the World System*, Journal of Anthropological Research, Vol. 60, No. 4 (Winter, 2004), pp. 562-564
- [34]. Michael Marmot and Richard Wilkinson, *Social Determinants of Health: The Solid Facts*, Second Edition, 2003, World Health Organisation
- [35]. Andrée Demers, Sylvia Kairouz, *A multilevel analysis of change in alcohol consumption in Québec, 1993–98*, Addiction, Volume 98, Issue 2, pages 205–213, February 2003
- [36]. Pia Makela, *Alcohol-related mortality as a function of socio-economic status*, Addiction, Volume 94, Issue 6, pages 867–886, June 1999
- [37]. Michael Marmot, *Inequality, deprivation and alcohol use*, Addiction, Volume 92, Issue Supplement s1, pages S13–S20, June 1997
- [38]. A. E. Hotchner, *Perfection Anxiety*, Vanity Fair, May 2014
- [39]. National Geographic, *Where the Rich Buy Drugs* (video) - <http://natgeotv.com.au/videos/drugsinc/where-the-rich-buy-drugs-345DF98D.aspx>
- [40]. Catherine Ostler, *Why do the children of the rich so often turn into drug addicts?* The Daily Mail, 12 July 2012
- [41]. *Ibid*
- [42]. *Ibid*
- [43]. David Moss, *Bank Failures, Regulation, and Inequality in the United States*, Harvard Business School, August 2010 - http://www.tobinproject.org/sites/tobinproject.org/files/assets/BankFailures_ChartwithComments_Moss.pdf
- [44]. Daron Acemoglut, Philippe Aghion, Giovanni L. Violante, *Deunionization, technical change and inequality*, Carnegie-Rochester Conference Series on Public Policy 55 (2001) pp229-264
- [45]. The Zeitgeist Movement, *The Zeitgeist Movement Defined: Realizing a New Train of Thought*, CreateSpace Independent Publishing Platform; 1 edition (22 Jan. 2014)
- [46]. *Post-ABC poll: Support for reducing the nation's budget deficit*, Nov 20-25, 2012, The Washington Post -

- http://www.washingtonpost.com/politics/polling/postabc-poll-support-reducing-nations-budget/2012/11/28/083a0a26-3952-11e2-9258-ac7c78d5c680_page.html, and; Robert Frank, *Even Millionaires Think The Rich Should Pay Higher Taxes*, The Huffington Post, 5 Jun 2014 - http://www.huffingtonpost.com/2014/05/06/millionaires-taxes-survey_n_5272647.html
- [47]. Quentin Letts, *Bog-Standard Britain: How Mediocrity Ruined This Great Nation*, Constable (29 Oct. 2009)
- [48]. Hopkin, Victor Lapuente and Lovisa Moller of the London School of Economics - <http://blogs.lse.ac.uk/euoppblog/2014/01/29/lower-levels-of-inequality-are-linked-with-greater-innovation-in-economies/>
- [49]. LynNell Hancock, *Why Are Finland's Schools Successful?* Smithsonian Magazine, September 2011
- [50]. *Ibid*
- [51]. Edwin P. Hoyt, *Horatio's Boys: The Life and Work of Horatio Alger Jr.* Chilton Book Company, 1974
- [52]. Michael Greenstone, Adam Looney, Jeremy Patashnik, and Muxin Yu, The Hamilton Project, *Thirteen Economic Facts about Social Mobility and the Role of Education*, Brookings, June 2013
- [53]. Pablo A. Mitnik, Erin Cumberworth, and David B. Grusky, *Social Mobility in a High Inequality Regime*, Stanford Center on Poverty and Inequality, June 2013, pg15
- [54]. Chul-In Lee, Gary Solon. *Trends in Intergenerational Income Mobility*. Review of Economics and Statistics November 2009, Vol. 91, No. 4, pp766-772
- [55]. Craig Jennings, *What Happens When We Tax the "Job Creators"*, Center for Effective Government, 9/22/2011
- [56]. *Ibid*
- [57]. Adam S. Hersh, Christian E. Weller, and Robert E. Scott, *The unremarkable record of liberalized trade*, Economic Policy Institute, October 1, 2001
- [58]. Julio H. Cole, *Milton Friedman on Income Inequality*, *Journal of Markets & Morality*, Volume 11, Number 2 (Fall 2008): 239–253
- [59]. M. Friedman, *Capitalism and Freedom*, University of Chicago Press, 1962, pg195
- [60]. Murray N. Rothbard, *Milton Friedman Unraveled*, *Journal of Libertarian Studies*, 16 (Fall 2002): 52. (This article was originally published in *The Individualist*, 3 [February 1971]: 3–7)

- [61]. Michael Otsuka, *How to be a Libertarian without being Inegalitarian*, *Raisons Politiques*, no. 23 (2006): pp9-22
- [62]. Mathias Risse, *Can There be "Libertarianism without Inequality"?* *Some Worries About the Coherence of Left-Libertarianism*, Nov 2003, John F. Kennedy School of Government, Harvard University, Faculty Research Working Papers Series 2003

1.9 The Ecology of Humanity

SINCE HUMANITY ROSE from its blurry, primordial origins, we have come to accept ourselves as something different; something unique. The religious and philosophical mantras which underpinned our infancy as a species spoke at great length of the sacredness of man, and of his suzerainty over the greater animal kingdom. The once nameless creatures who rose to such dominance would also be the first to bestow upon themselves a most unusual honour: The ability to name oneself and one's kind.

Even when Carl Linnaeus brought forth the controversial classification in 1758, the name which he offered as the banner of humanity echoed a continuing dichotomy between man and its connected tree of life. From that day forth, despite being begrudgingly acknowledged as part of a wider primate family, the human would become the *Homo sapiens*; the wise one.

Religious or irreligious alike, few rational people would nowadays profess humans as creations of divinity (although this view is still worryingly common in the 21st Century), but Linnaeus's linguistic dichotomy of wise and unwise remains subconsciously ingrained. Needless to say, the depth and breadth of human wisdom has certainly exploded in magnitude since the days of Linnaeus.

Spaceflight, nuclear physics, evolutionary biology and a whole host of new disciplines, unimaginable to a denizen of the 18th Century, are now common knowledge. Yet while the wise ones stand proud surveying their demesne of acquired knowledge, retrospective modesty is conspicuous in its absence. The thought that the wise ones could have possibly built their gargantuan Pharos on inadequate foundations is one that is not often considered. Man is different; his goals and aspirations are different to the lowly wilderness dwellers.

Through the wisdom which our name reflects, we have set ourselves apart from our extended tree of cousinship like no other before us. Our wisdom has sculpted and reconfigured the environment to its own ends, often to the detriment of life forms dependent upon it. Our wisdom has allowed us to unlock

energy from the most improbable locations, unparalleled by a nature which remains an energy slave to metabolism. Our wisdom has allowed mastery of geography, seeding human life to even the most far flung reaches of the planet in ever exploding numbers. Our wisdom has also however led to unwanted circumstances.

War and terrorism between races and creeds continues to be a thorn in our side, while emissions of poisonous gases from our technology erode our environment and wellbeing. Population woes are not foreign to us, and global authorities on such predict shortages of food for our swelling numbers which are too close for comfort. Despite such issues, general morale remains high that our wisdom alone can tackle such unfortunate circumstances, and that a major rethink is not mandatory.

Ultimately, the Linnaean dichotomy manifests itself in this attitude of limitlessness and perpetuity for humanity; a world where there is one set of rules for us, and another for all who are not blessed with our wisdom. It is a belief which underpins the nonchalant attitude towards our ever changing world, and the overzealous faith in technology as our emancipator from an impasse of any severity.

The true danger of this attitude is that it is not obvious or conscious. Few would claim to hold these black and white views outright, but fewer would even ponder such issues at all. Our wisdom has led us to an age of ecological incompetence; an age where the obvious fragility of our assumed perpetual civilisation is outright ignored; an age where we live in the starkest possible dissonance to even the most elementary ecological principle.

It is our failure to apply these ecological principles, many of which we have painstakingly honed by scientific trial, and draw parallels with our own existence and the fate of other, non-human populations on earth. This is the heart of Linnaeus' dichotomy of us and them. It is only by abandoning this notion that humanity is wise or different to any other species that civilisation will have a hope of future prosperity. Wisdom has brought us this far, only through humility can we negotiate the path ahead.

A Catton Perspective on Capacity

In 1980, William R. Catton Jr. authored a book entitled *Overshoot – The Ecological Basis of Revolutionary Change*. The book is a sobering and brutally honest assessment of modern human society through the eyes of straightforward

ecological theory. This chapter will in essence be a rundown of the key points which are offered in this groundbreaking book.

One of Catton's most powerful observations in this publication was the emphasis placed on the carrying capacity of an ecosystem with respect to the organisms which live within it. In order to fully understand the importance of this viewpoint, we must first summarise what is meant by the carrying capacity of an environment, and the reason why a carrying capacity oriented view is so crucial to sustaining human civilisation. We will approach this by discussing the relevance of resources in an ecological system.

By necessity, a species requires resources to survive and function. Every plant is hopelessly dependent upon nutritional resources from the soil, and upon energy from the sun. Every gazelle requires the resources sequestered by the plant for survival, and every lion requires the resources sequestered by the gazelle. The conflicting interests of different living organisms in relation to their resource needs contribute to the endless arms race of natural selection.

Humans are no exception to this resource hunger, and are biologically privileged enough to be satisfied by nutritional resources from plant or animal alike. At the end of the day, it is fairly irrelevant which variety of resources are used to nourish an organism, as all energy, whether in the flesh of a fresh kill, or in the crunch of savannah grass, owes its initial origins to the nuclear furnaces of the sun. It is needless to say that in a world without the abundant nuclear energy from the sun, all would be destined for a total, no questions asked end to life.

While humans fit nicely into the concept of demand for resources, we differ in one important aspect: scale. In general, non-hominid organisms are limited by their biology with regard to the amount of energy they may unlock from their hard fought resources. A predator's actions will be limited by the amount of meat it has consumed, and the stored energy liberated from within. A herbivore will be limited by the chemical energy it can unlock from digestion of plant cells, just as the unfortunate plant was limited by the amount of sunlight its leaves could catch, and the nutrients which its roots could reach.

Humans are similarly limited by resources for energy, but the limits are not as absolute, nor as constricting. Through application of our reasoning, logic and eventually technology, we have been able to progressively unlock more energy from our resources, and to make available resources which would otherwise be inaccessible or useless.

Through the discovery of fire, we became able to release more energy from food by cooking before eating; through horticulture and agriculture we became able to make the environment work for us rather than vice versa; through subjugation of oxen and primitive ploughing tools we were able to increase our yields. Through our wisdom, we progressively transcended our biology, and magnified the great chasm between humanity and nature which Linnaeus' words would echo thousands of years later.

That biological chasm today stands wider than it ever did. Our biology now provides a negligibly small fraction of the energy which we voraciously consume. We instead rely on the explosive energy locked within million year old fossilised life, liberated from deep under the ground. We used this ancient energy to power perpetual sunlight, on demand at the flick of a switch. We use it to power vehicles to speed us across vast distances in comfort, and even great flying machines to traverse the world.

However, the necessity of resources for existence does not end with nutritional and energy sustenance. All plants and animals rely upon adequate space in order to function, a resource which is subject to no less significant competition than food. Even when competition is not relevant to acquisition of resources, the dependency of an organism upon them is no less obvious. A world without the crucial resource of breathable air, rich in oxygen and carbon dioxide would spell extinction for all imaginable forms of plant and animal life.

Our wisdom has led us to erode these near abundant resources at an ever increasing rate. As our numbers swell and our vast industrial lungs exhale toxic gases, we can begin to see the fragility and the precariousness of our ecological tightrope all too well. The concept of carrying capacity begins to come into our field of vision, but before we address it entirely, we must glance at a distinctly human resource fetish.

The Human Resource Inventory

The adorable woodpecker finch of the Galapagos Islands is a relative oddity in nature, as it uses a cactus needle (or simply a twig in some cases) to help it access termites deep within tree trunks. From an ecological perspective, we must conclude that this implement is an important resource to the user, as without this tool, the finch would be stripped of the ability to exploit otherwise unavailable sustenance, and thus be rendered uncompetitive. There are many other species, from ape to elephant, which utilise rudimentary tools in order to greater harness the environment around them.

Thus, we stumble upon the most human of resource dependencies, to be considered in a fuller picture of carrying capacity. While the humble woodpecker finch supplements its biological proficiency with simple tools, the wise human has rendered himself entirely dependent upon them, and thus by association, the resources needed to construct them.

It is difficult to picture a modern human civilisation without the extensive tool usage which we take for granted on an everyday basis. We utilise transportation tools, tools that surround us with shelter, tools that clothe us and keep us warm, tools to communicate vast distances, to entertain and pleasure us.

Beyond our obvious repertoire of tools, there lies a further backline of tools which are used to build other tools, or to unlock solar energy to fuel tool usage. It is because of our extensive usage of these implements that Catton, perhaps somewhat cynically stated that *Homo sapiens* was no more, and our current tool intensive form represented a new pseudo-species; thus he would coin the label, *Homo colossus*^[1].

What sets *Homo colossus* apart from the simple wise ones is that, in addition to our biological needs for nutrition and chemically stored solar energy, we also required resources to construct and power an ever growing catalogue of audacious prostheses. These prostheses may augment our ability to communicate, may enable us to fly or inhabit inhospitable regions, or simply allow us to enjoy ourselves.

If you have ever ridden an exercise bike which features a wattage output meter (it baffles me why people would want to measure this while exercising) then it will be patently obvious to you how our biology is wholly inadequate to power even a fraction of the exotic tools which we depend upon every single day. One is reminded of the BBC experiment, in which eighty people pedalling exercise bikes were required to power a single four person house for a single day^[2].

This may seem relatively shocking, but the true severity of the issue still remains elusive, as it is not visibly clear where the BBC's eighty cyclists drew their energy from. Tracing the energy back, we arrive at the conclusion that the energy must have been unlocked from food, which itself was once alive and consumed energy from other living things, or the sun directly.

These living things which sequestered the energy for the human cyclists are therefore also dependent upon resources themselves, and require their resource needs to be met in order to be able to provide energy. This essentially boils

down to space and nutritional resources; the amount of high quality, fertile arable land to raise a healthy animal or plant from.

It also follows that as livestock are further down the energy chain from the sun, due to the fact they unlock energy from eating plants, rather than direct photosynthesis, that they are dependent upon a greater amount of fertile arable land. Table 1.9-1 provides typical quantities of land to raise the specified foodstuff, showing the more land intensive produce to be meat.

Food	Land per kg (m²)	Calories per kilogram	Land per person per year (m²)
Beef	20.9	2800	8173
Pork	8.9	3760	2592
Eggs	3.5	1600	2395
Milk	1.2	640	2053
Fruit	0.5	400	1369
Vegetables	0.3	250	1314
Potatoes	0.2	800	274

Table 1.9-1: Typical land requirements per kilogram of produce. Tabulated from [3]

A typical single person eating an omnivorous European diet has been calculated as requiring 3,500 square metres (approximately 0.85 acres) of arable land^[4]. As the cyclist experiment was carried out in Britain, we are safe in assuming that the participants were eating a typical omnivorous diet in keeping with Western norms. We can therefore confidently deduce that in this simple experiment powering a typical home for a single day is indirectly dependent upon energy unlocked (in various forms) from eighty, 3,500 square metre plots of farmland; an area just shy of 70 acres.

The concept of a carrying capacity is now becoming clearer, as our illustration clearly shows how we are limited by a relatively unchanging capacity for land to generate resources necessary for our continuing existence. With each Western household consuming the energy of eighty or so people, and thus drawing upon a land mass of around 70 acres, we can begin to see the importance of carrying capacity in the context of civilisation.

In a country of 17.9 million families each drawing upon approximately 70 acres of land, the question we must present is: where is all the land coming from?

How is it possible that the UK and indeed other Western countries can sustain such energy consumption beyond their obvious geographical carrying capacity?

The answer to this is twofold. You will notice I chose my words carefully on the previous page when I stated that carrying capacity was *relatively* unchanging. In reality, we are able to augment carrying capacity to an extent, as will be covered in depth later on. However, the second, much more critical approach which enables us to sustain such carrying capacity beyond our geographical means will be covered presently. The following subsection will detail the phenomenon known as 'drawdown'.

Drawing Down a Parallel – The Detritivore

From a Western perspective, it is not difficult to see why our ecological naiveté eludes us. Upon first impression, the viability of our position to acquire resources to sustain human life seems convincingly robust. It is not immediately obvious that our humble dwellings occupy a phantom acreage far beyond their geometric dimensions. The source of this mysterious acreage is the crux of our interest here, and its origins may not be all that surprising.

Liebig's law of the minimum is an important concept to introduce here. It states in its most general form that integrity or growth of an ecosystem is not limited by the sum of all resources available, but by the scarcest one^[5]. This can be colourfully illustrated by a barrel constructed from staves of differing length (a stave is a wooden member which runs longitudinally along the length of a barrel). When filling the barrel, it is obvious that regardless of the average or total stave length, the barrel will only be able to hold water up to the height of its shortest stave before it begins to spill. Thus the integrity of the barrel is limited in a sense, by its most scarce resource.

This view may be extended to the concept of an ecosystem dependent upon resources. To visualise its relevance to ecology, another whimsical thought experiment is in order. Imagine if you will, a small island that possessed a most peculiar feature. This island had a single, magical tree at its centre which could produce limitless fruit of any variety at the request of anyone who desired it.

We could also stretch this hypothetical scenario to allow the tree to 'heal' itself in some extraordinary way, so that it may offer a limitless supply of wood as building material. Suppose also that this island was blessed with a daily rain shower, regular as clockwork, which produced enough water to clean and quench the thirst of a large number of people.

The idea of such an island seems like paradise, but in order to complete the illustration, I must throw a spanner in the works. It turns out that this island of magical wonder is only one hundred square metres in area, and vast, impassable oceans surround it on all sides. It now becomes obvious that the shortest stave in the case of this island's carrying capacity is its geographical features.

It is all well and good to have a source of food, water and material for tools to sate the desire of a population of any size, but without the space for them to live, the carrying capacity of the island is limited. But we must not fall into the belief that space is the only possible limiting factor. If the island inexplicably grew to the size of Texas, with the only side effect being that the once daily rainfall was now once monthly. Carrying capacity would now be limited by the access to water rather than the now plentiful living space.

Thus, the scarcest resource dominates the carrying capacity of an ecosystem. However, human wisdom has brought us several quirks which allow us to bend these rules. Tools are now advanced enough to traverse the vast distances between distinctly different ecosystems, each with distinctly different short staves. Suppose that across the vast ocean from the now Texas-sized magical island was a similar island, barren and with scarcely any capacity to grow food whatsoever. However this island was fortunate (or unfortunate) enough to be bombarded by eternal rainstorms from a magical cloud, creating vast lakes and rivers of fresh water as far as the eye can see.

The denizens of the Texas-sized magic tree island, now endowed with human wisdom developed the capability to cross the vast ocean between these two distinctly different ecosystems. A concordance was naturally arrived at when these distant people met, allowing a pipeline to be constructed to transport fresh water to the land of the magic tree, and an ocean going convoy to transport vast quantities of food to the land of the magic cloud.

This arrangement would lead to greatly increased carrying capacity for both ecosystems, as the longest stave of one ecosystem could be willingly sacrificed in order to lengthen the shortest. With the limiting factor now augmented by excess from a far off land, carrying capacity would naturally grow to reflect this. This is expressed somewhat more dryly by Catton's inequality as below:

$$CC_{(A+B)} > CC_A + CC_B$$

The above simply states that the carrying capacity of a combined resource ecosystem (A + B) is greater than the sum of ecosystem A and ecosystem B

alone. This humble equation is partially responsible for the origin of trade, allowing mutual gain across borders through exchange of needed goods^[6].

However, as the reader has come so far, it will be obvious that the world is not a mutual or equal place. The world is not just unequal in the sense of distribution of trade and economic wealth, but it is also unequal in the sense of population density and apparent carrying capacity. It would seem by intuition that densely populated first world countries such as the UK or Japan must have huge resource stocks at their disposal, either adequate to live off self sufficiently, or with surpluses in one department large enough to sacrifice to trade, and inflate their limiting factor.

In reality, we know that this is simply not true. By 1965, the UK was relying upon half of its food resources from acreage beyond its borders. In a study by Friends of the Earth in 1996, it was calculated that the UK relied upon 4.1 million hectares (an area slightly smaller than Switzerland) of land from other nations in that single year^[7].

Japan is a somewhat different spin on the same story, as while it is dependent upon trade with other countries for sustenance, the country is also dependent on the sea for two thirds of its acreage^[8]. The problem however sadly extends far beyond the most densely populated of first world countries.

In 1999 a European Parliament report stated that Europe was unable to feed both its people and its livestock without importing ghost acreage from developing countries to grow animal feed^[9]. In the same year, Tim Lang of the Centre for Food Policy stated that Brazil exported approximately 5.6 million acres of land to grow soya beans for European livestock^[10].

However, ghost acreage from beyond a country's borders is not the largest of our worries when confronting the ecological issues faced by civilisation. There is a second and slightly more perplexing source of acreage which we must explore. As the title of this section suggests, we are going to approach the problems with our primary source of invisible acreage by drawing a parallel within a natural biotic ecosystem.

As already demonstrated by the fundamental ecological principle of resource acquisition and Liebig's law, we have seen that we, like creatures in nature, will always be wholly dependent upon resources for continued existence. The monolithic system of trade which we have built upon this underlying, unchanging paradigm does little to mitigate the underlying problem, only blur it.

A search for parallels in nature for the original *Homo sapiens* is a relatively uneventful search. Like our primate relatives we are gatherers, but supplemented by some hunting for high protein meat. *Homo sapiens* of old did not rely on ghost acreage for food or tool construction, and so their conduct within an ecosystem was typical of any other omnivorous mammal, only with a fetish for tool usage.

Finding a parallel for Catton's *Homo colossus* however is a less obvious affair. A parallel can however be drawn which is surprisingly fitting, and which has sobering consequences looking forward to the future. In our means of resource acquisition, we are akin to bottom feeders.

Perhaps the most direct expression of this is written by Arthur Boughey in *Man and the Environment*, as below:

"A pond in an evergreen forest may receive very little sunlight, deriving its energy from forest detritus that blows or falls into it... For some purposes, it is useful to conceptualise a city as a detritus ecosystem, dependent on external sources of energy."^[11]

While Boughey spoke of a city in his writing, it is equally apt to view this statement with relation to civilisation in its entirety. It will come as little surprise to many that our civilisation is habitually dependent upon oil, however it is not made crystal clear what oil actually is. Without delving too much into the chemistry of the process, oil (and all other fossil fuels for that matter) owes its origins to ancient sunlight from a period called the carboniferous.

This ancient sunlight was captured by equally ancient plankton, which were ruthlessly gobbling up sunlight as they still do today. As the plankton died and sank into the sediment, they gradually built up and formed a thick layer. Over vast time spans, geological activity would lead to these layers of plankton being forced under great pressure, so great in fact that their chemical structure would change. Thus a concentrated concoction of liquid sunlight came to exist deep within the earth.

The point of this is to underline the fact that oil is in essence ancient detritus. It is nothing more than liquid sunlight from the distant past. I need not dwell on the extent to which human civilisation is dependent upon oil as this is covered in great depth in the following chapters. What sorely needs to be covered is the fundamental ramifications of our oil addiction when viewed through the lens of ecology.

Humans are detritivores. That being said, there is no inherent shame in the mere act of living off the energy stored up in ancient detritus, as there are a great many creatures who make their living in such a manner; the humble earthworm for example. What sets humans apart from their earthworm peers is simply a function of rate.

To clarify, let's return to Boughey's pond in the forest, sustaining microbial life forms by way of stored sunlight within detritus. The lifeforms within the pond are dependent upon a flow of detritus which may supply the pond at an approximately constant rate over a given time period. Let us assume for the sake of illustration that the microbes within this pond undergo some kind of genetic transition, enabling them to rely upon a new form of sustenance hitherto unavailable to them.

This previously unused resource, we may consider them to be leaves of a different variety or some such, will have inevitably formed a stockpile due to lack of usefulness within the ecosystem. Behind this extant stock they will also be constantly replenished at a natural rate of 'production' (the rate at which they enter the pond ecosystem).

The adaptation of the microbes to the new and abundant form of sustenance would be marked by a microbial population explosion, as the numbers grow to align with newly increased carrying capacity. At some critical point, the impetuous microbes will be consuming their newly found delicacy at a rate faster than the rate of deposition into the pond. This is the point when the brave detritivores enter drawdown. What drawdown leads to is a dependency upon a resource which has been rendered finite by the difference between consumption and production, and what it invariably results in is the unassuming title of Catton's seminal book: *Overshoot*.

Overshoot is what occurs if organisms draw down resources. This process of 'stealing from the future' invariably leads to a situation where the future population is left without sufficient resources to maintain itself. When humankind discovered crude oil, and became technologically savvy enough to generate energy from it, humans transitioned to exploiting this tremendous stockpiled resource, just like the microbes in the pond. Indeed, just like those microbes, humans began to consume this fossil energy at a much greater rate than it naturally replenished itself.

Overshoot is however not limited to drawdown in detritus ecosystems, as we observe overshoot and crash in a plethora of populations in nature. Figure 1.9-1

shows overshoot, crash, and population explosion of lynx progressing through a cyclic oscillation based upon the availability of prey, in this case hares. While this may seem abstract from the idea of an oil fuelled human civilisation, or even an exuberant microbial pond, the underlying dynamics are again only different in terms of their rates.

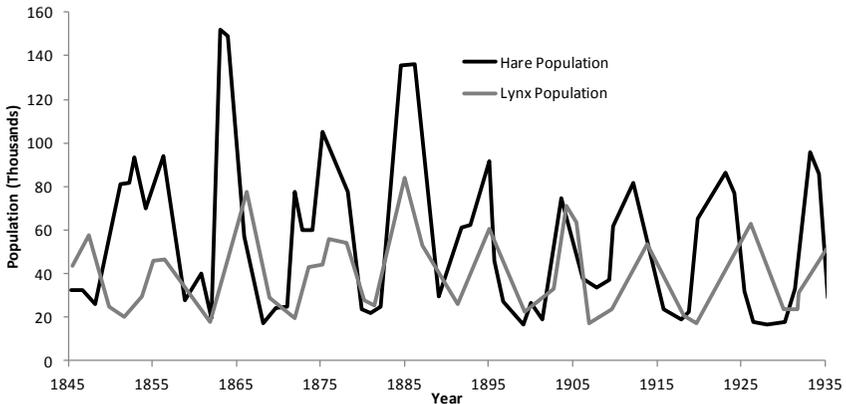


Figure 1.9-1: Changes in abundance of the lynx and snowshoe hare - Adapted by author from [12]

We can see that as the lynx population explodes and overconsumes, the hare population begins to be predated at a rate which is greater than the rate of replenishment; that is, new hares being born. The lynx population predictably overshoots and crashes, but in doing so falls to a far lower level of predation. This easing of demand allows the natural rate of hare reproduction to begin to replenish the population, as fewer cats invariably means fewer hares as meals, and soon the hares are the ones enjoying rapid population growth. The whole gruesome cycle is then seen to repeat ad nauseum.

Human civilisation is no different, only our delicacy is the condensed cocktail of ancient sunlight rather than a simple hare. Oil, like hares, has a rate of reproduction. The only difference is the fact that oil's reproduction rate is measured in the millions of years. This would be inconsequential if humans had also developed a reproductive rate measured in the millions of years, however it is not difficult to see that this is not the case; our rate of growth is far quicker than the resource which we are dependent upon.

Presented with this ecological inevitability of overshoot and crash, we must ask the question of how we came to be so sorely dependent upon a resource which replenishes itself at such a painfully slow rate. The simple truth is that, like the

hypothetical microbes in the forest pond, we adapted to a stockpiled resource which was hitherto unavailable. The leaves had been gathering in the pond for time immemorial, but it was our evolution from an agrarian to an industrial civilisation which enabled us to exploit this untapped trove of stored sunlight. Once humanity began to consume this ancient sunlight, it was doomed to drawdown, and to ultimately engorge its population beyond the sustainable rate of resource replenishment.

Overshoot and crash may seem to many as a concept that is not applicable to humans; the resonance of Linnaeus' age old dichotomy of wisdom, but we must make a case of such population collapses in the context of humans. Historical precedent will teach us that these events are not unheard of within human societies, contrary to what our imbued wisdom may suggest. Catton's witty writing will also enlighten us later on by demonstrating how such views are very common and indeed predictable, but first a trip to Easter Island is in order.

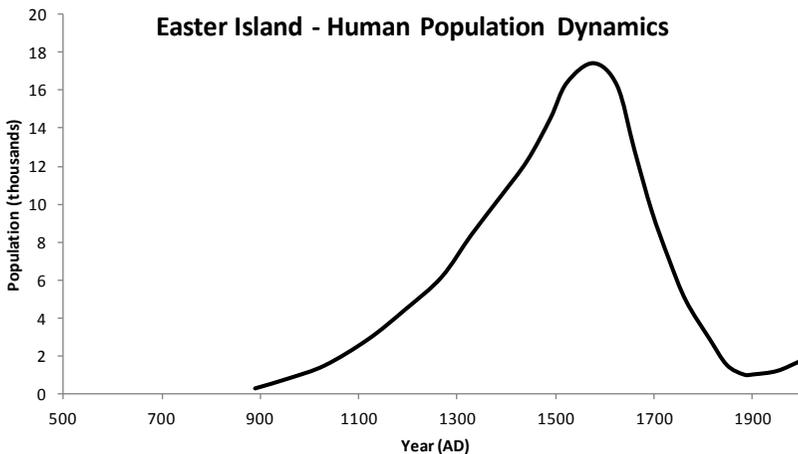


Figure 1.9-2: Human population dynamics on Easter Island - Adapted by author from [13]

Easter Island was initially settled by a handful of Polynesians around 900AD. The canoe load of humans had stumbled upon a wonderful land, rich in fish for sustenance and timber for construction of tools and shelter. Population growth exploded, and within 500 years, the humble canoe load of travellers had become a sprawling community of around 15,000 people. But the shortest stave in this ecosystem proved to be elusive.

Fish stocks remained fairly strong throughout this period of growth, allowing food to remain adequate for the engorged population, but what instead spelled

doom for the inhabitants was somewhat unexpected. By 1600, the population stood around 17,000, and consumption of timber for fishing apparatus began to rear its head as a genuine problem.

Bereft of material for tools, the islanders became unable to fish and were plunged into to a vicious and cannibalistic crash which lasted for nearly four centuries. Looking at the graph in Figure 1.9-2, it appears that the defining moment of the Easter island story occurs at the peak around 1600. In fact, the defining point of this explosion and crash is not easily available from the graph. It is instead at the moment when one fisherman came of age such that he and his fellow fishermen demanded resources for tools which were beyond the capacity of the woodland to replenish. At this moment, the population began living beyond its means and was condemned to drawdown the resource which they depended upon.

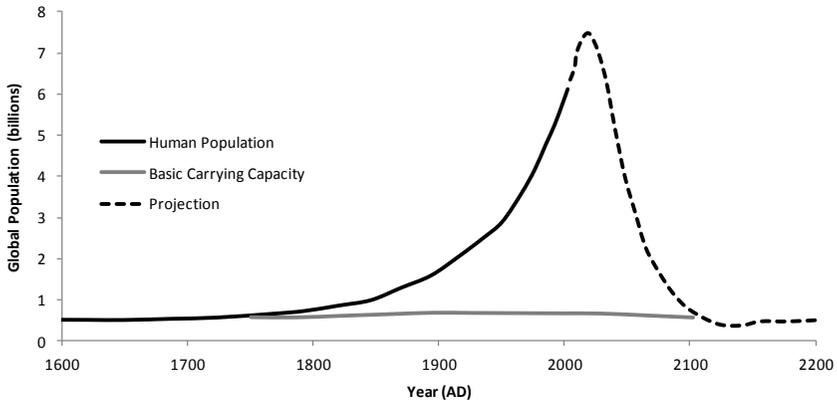


Figure 1.9-3: Human Population on Earth, plus potential projection - Plotted by author from [14]

Figure 1.9-3 shows human population trends at a global level. The parallels between our drawdown of oil and the Easter islander’s drawdown of timber are not worth elaborating upon, as they are identical in all but numbers. What is however interesting here is the reasonably straight line across the bottom of the chart. This represents the unaugmented carrying capacity of the global ecosystem without fossil fuel.

This line is absent from Figure 1.9-2 because the Easter islanders did not have a stable population on the island before exploding and crashing, simply because they arrived from elsewhere. The global population is a different kettle of fish, as we have a reasonable idea of the basic carrying capacity of the planet without fossil fuel drawdown. This is based upon the millennia of fairly stable human

numbers (there will have still been local fluctuations and crashes, naturally) before the industrial revolution.

This line is important, simply because it represents approximately (we will deal with how approximately in coming pages) where the post-oil crash may take us. Obviously from the figure, if this is the true carrying capacity of the global ecosystem in its unaugmented state, free from any influence of sustained drawdown, then the coming crash at the end of the oil age is unimaginably massive in scale. The importance of an ecologically coherent path is no more pressing than when examining the bleak future of our oil addiction.

Drawing a Parallel – The Yeast

Humans are no different from any other organism. This has become obvious when exposing our dependence upon finite resources, and the precariousness of our theft of these resources from the future. However, our slavery to ecological laws does not end with simple resource dependence. In a purely hypothetical world of infinite resources, a limitless and ever growing human population is just as fallacious as within our world of limits. In order to illustrate this point, a further adventure into the realms of our peers is required.

The humble yeast fungus, which has enabled the creation of such human dietary staples as bread and alcohol, is notably subject to the ecological laws in question here, and as such offers an excellent illustration. In subjugating the single cell organism of yeast to do our bidding, and aid in the production of interesting foods, humans are doing something profoundly interesting.

When yeast is contained within a vat and kindly requested to make grape juice into a fine wine, what is actually occurring is the yeast is being offered an abundant resource, in this case sugar, to feast upon. In the process of consuming this sugar, the yeast's alcoholic excrement will give the fine wine its intoxicating attributes, much to the winemaker's agreement. Presented within this surfeit of sustenance, the simple yeast population will begin to explode and consume greater amounts of sugar, much like a human population presented with a near infinite oil reserve.

What the poor yeast cells do not see coming is that their potent ethanol excrement is deeply damaging to them, and as population explodes, the volume of this excrement will explode in parallel, progressively polluting their surroundings. Eventually, as with any winemaking process, the yeast's population will render its own environment uninhabitable, simply by carrying out the processes natural to it.

In an instant, the unwieldy population so hungry for the stockpiled sugar will begin to ignominiously suffocate in its own faeces. Its environment will become inhospitable to it, based purely upon its own actions. This makes a pleasant tasting beverage, but is less than ideal for the living organisms involved.

Homo colossus has breathed through vast industrial lungs for centuries. These lungs are fuelled by the copious amounts of fossil fuels at our disposal, and in return for their respiratory energy, expel equally copious amounts of carbon dioxide. Carbon emissions are no mystery to us, as they remain a driving force in the field of legislation and environmental concern. However it is not conventional to view this ongoing exhalation of carbon from an ecological standpoint, and most rather see it as a simple unforeseen circumstance of technology.

The fact of the matter is that from an ecological perspective, our carbon quandary is anything but unforeseen; it is as obvious and inevitable as the humble yeast suffocating in their alcohol waste. The existence of an exploding population going about its natural business leads to the erosion of its environment; humans are not exempt.

Our limited field of vision presents the planet to us as a relatively unchanging domain. We humans live for but a few decades, maybe a century if we are lucky, a time that is unimaginably short in the context of our earth. Venturing back approximately 3 billion years, we arrive at a world which is unfathomably different to our own.

We arrive on a world with an atmosphere which is almost entirely devoid of oxygen, a world where an unprotected human on the surface would die nearly instantly. Photosynthesising lifeforms dominate the global ecosystem, but it is hypothesised that this archaic photosynthesis did not result in oxygen as a waste product^[15].

At some point around this time, algal cyanobacteria began to grow in number. This algae was apart from its peers as its photosynthesis resulted in the by-product of oxygen. This oxygen however was not able to become the abundant and life-giving gas which we know today, as it was captured in chemical reactions with iron and organic compounds, first within the oceans, and then on land.

The unrelenting engine of oxygen production however would not be held at bay, as eventually these elements capable of sequestering atmospheric oxygen

became saturated, and unable to take any further amount. At this point, the levels of oxygen in the archaic air began to rapidly rise. (Figure 1.9-4)

This defining event is typically given two names; the Great Oxygenation Event (GOE), or the Oxygen Catastrophe. The names are indicative of the viewpoints of two great branches of the tree of life. From our oxygen dependent perspective in the animal kingdom, the event was certainly great, as without it the kingdom would never have come into existence. However from the point of view of the photosynthesising bacteria, it is impossible to see the event as anything other than a catastrophe. The humble algae, by simply doing what is natural to them in order to survive had radically altered the chemical makeup of the entire atmosphere, creating a world which was inhospitable to them.

The modern earth is a very different place today. We live in an atmosphere of mostly nitrogen and oxygen, with just trace elements of the once abundant carbon dioxide. Granted, the extreme outcomes of the Oxygen Catastrophe are not likely to be repeated at the hands of humanity, with a flood of carbon suffocating all oxygen breathing life, but the precariousness of our complex, hospitable environment does not require such absolute eventualities to be rendered inhospitable.

The world is an interwoven system relying upon symbiosis between organisms and processes. Just as our natural cumulative actions flood our atmosphere with gases which are ultimately poisonous to us, our natural growth encroaches upon organisms and cycles which offer important processes towards our sustenance.

While it is obvious that growing human populations naturally require more resources, destruction of forests for timber and arable land also erode the biosphere's ability to sequester our poisonous carbon waste. Through our natural exuberant growth, we have become wholly dependent upon tearing apart the environmental systems which sustain us, and as such accelerating our own succession.

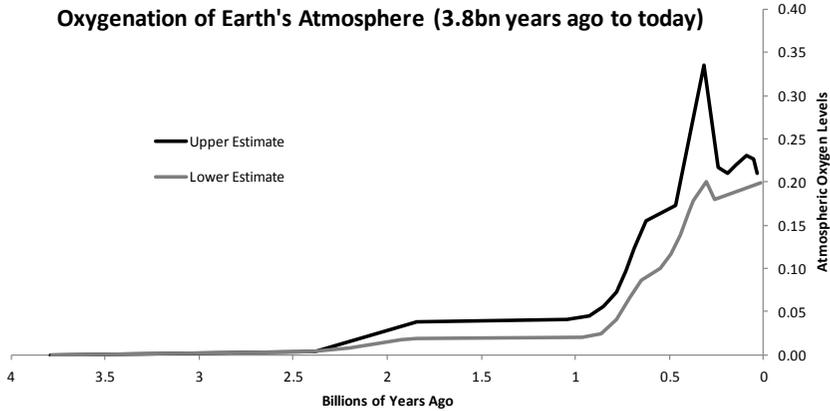


Figure 1.9-4: Ancient oxygen levels in the early Earth, and the Great Oxygenation Event - Adapted by author from [16]

Historical scientific responses to this fundamental chaos within ecology have been met with varying degrees of acceptance. Among the first to note the chaotic relationship between living organisms and their environment were James Lovelock and Dr. Lynn Margulis, who in the early 1970s proposed the Gaia Hypothesis. This concept however idealistically viewed the Earth as a self regulating system, in which all living organisms contributed to maintaining the wider biosphere for mutual benefit. This was used as a potential explanation as to how atmospheric gases seemed to be so stable and delicately balanced^[17].

This hypothesis was never fully welcomed into the scientific community, but none the less gained some traction, and attracted several large conferences dedicated to its study and discussion. The warm reception for Gaia by so many is easy to understand - it offers a view of the Earth as a system in which the parable of the yeast is not a terminal shortcoming of individualistic evolution, but instead a temporary imbalance, which will drive the wider biosphere to adapt and accommodate.

The trends in modern climatology have however left Gaia with a great deal of explaining to do, and while Dr Margulis' view of the Earth as a symbiotic, interconnected system have opened new doors for interpretation of the biosphere, it is clear that mother nature is not so motherly, nor intrinsically self regulating. Toby Tyrrell of the UK National Oceanography Centre summed up the modern consensus view in his paper.

"I believe Gaia is a dead end. Its study has, however, generated many new and thought provoking questions. While rejecting Gaia, we can at the same time appreciate Lovelock's originality and breadth of vision, and recognise that his audacious concept has helped to stimulate many new ideas about the Earth, and to champion a holistic approach to studying it."^[18]

So what understanding can we glean from a world where evolutionary success condemns a species to drown in their own waste? More importantly, with humans at the unchallengeable apex of evolutionary domination, why has the parable of the yeast not already caught up to us and begun its expungement? The answer will be tackled in the following subsection.

Exuberance and Augmenting Carrying Capacity

How do humans maintain their place in nature, in light of the seeming cataclysmic predictions of ecology? Malthus pointed to the immediacy of population catastrophe as far back as the 1700s^[19], yet if he were alive today, he would likely be unable to fathom a world of 7 billion and growing. What is it that seemingly renders humans immune to the ecological die-offs that are so commonplace in our animal cousins?

You may remember me choosing my words carefully earlier in the chapter when I stated that carrying capacity was *relatively* unchanging with time. With respect to this, Linnaeus was right in some regards; humans are wise. Our wisdom has enabled tools and processes of great complexity which are able to mould the environment around us, of course within limits.

Through swelling societal complexity, the distribution of labour, and the intergenerational handing down of knowledge and technology, humankind augments the effective carrying capacity available, and grants itself a temporary or in some cases a semi-permanent boost to the size of the population that can be supported. Catton describes how even some of the smallest and most banal social phenomena are actually highly complex mechanisms to upwardly augment carrying capacity.

"...for modern nations; adequate sustenance production depends on highly coordinated social mechanisms. These can be fragile. If they break down, effective carrying capacity is diminished, leaving a swollen population in a state of overshoot... Visualize a large city bank on a busy day. Customers sometimes arrive in the bank faster than the tellers can serve them, and queues spontaneously form. Customers

generally do a reasonable amount of waiting in line with reasonable patience, knowing others will similarly wait their turn to do business, and confident that the delay is no threat to completion of the business they have in mind."^[20]

Systems of increasingly globalised trade and labour also act as methodical measures to augment carrying capacity. As we have discussed through Liebig's Law, the shortest stave of a local ecosystem can be artificially lengthened by trade. As the arid Dubai built vast infrastructure to import fresh water, or the nations of Central America purchased food from abroad in order to supplement their inadequate farmland, opening trade amongst populations acts to artificially inflate the carrying capacity of each discrete region.

Within nations, resource availability is stridently organised in order to optimise capacity further. Economic systems emerge, in which specific jobs arise in place of hunting and gathering or subsistence agriculture. By distributing food production, energy generation, waste management and other such life supporting prerogatives, complex societies are able to incrementally optimise carrying capacity.

By heaping up waste and transporting it to designated landfills or advanced sewer systems, we allow ourselves to go about our lives in a relatively unperturbed manner, not maligned by our own excrement in the way the wine vat yeast suffer.

But surely this is all obvious? By optimising society in order to squeeze every last drop out of the potential carrying capacity, civilisation grows and flourishes, so where is the folly in this route? The true issue here is that while incremental improvements in carrying capacity are occurring, self directed population trends are utterly unaware of any potential limit to these increases, and continue to accelerate blindly towards the ecological limits with little concern.

But this is not the only factor to consider. Much of humanity's inventiveness in augmenting and expanding carrying capacity has an inverse ramification elsewhere, which acts to erode carrying capacity in the longer term or in a different way. We are utterly surrounded by examples of this short-sightedness with regard to our own ecological environment.

By clearing woodland for farmland, we are able to produce more food, but lose powerful carbon sinks which would act to balance our life-giving atmospheric composition; by transporting food around the world, we circumvent regional

shortages, but invest disproportionate amounts of non-renewable, fossil fuel energy in the process; by intensively farming land using mechanisation and fertilisers, we increase food yields in the medium term, but erode the land's ability to keep up such production into the future.

The result of this is that while carrying capacity is seemingly rising to meet population needs, the raw capacity beneath humanity's augmentations is actually falling away. This concept is illustrated in Figure 1.9-5.

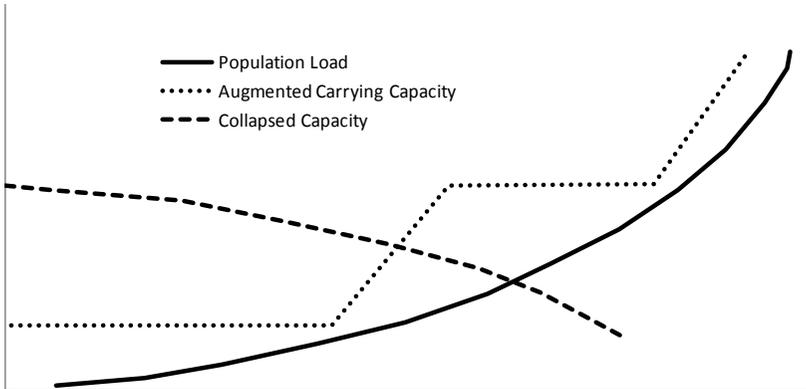


Figure 1.9-5: Diagrammatical representation of Population growth, incrementally augmented carrying capacity, and long term carrying capacity - Adapted by author from [21]

So, while piecemeal, temporary and incremental additions to carrying capacity give the impression that human population is utterly unconstrained and can accelerate freely forever, the reality is that the population load is constantly challenging capacity, as with any other earthbound species. Irrespective of humanity's inventiveness in expanding capacity through various societal or technological means, so long as population continues to accelerate, or remains above the long term sustainable capacity, population collapse is inevitable.

Catton summed this reliance upon human inventiveness to transcend nature's boundaries in his discussion of the ecological worldview versus the conventional 'people-based' worldview. These conflicting worldviews are shown in Table 1.9-2, of particular note is point 4 in each of the worldviews.

<i>Ecological Worldview</i>	<i>Conventional 'People-based' Worldview</i>
<p>E1: Human beings are just one species among many species that are interdependently involved in biotic communities.</p> <p>E2: Human social life is shaped by intricate linkages of cause and effect (and feedback) in the web of nature, and because of these, purposeful human actions have many unintended consequences.</p> <p>E3: The world we live in is finite, so there are potent physical and biological limits constraining economic growth, social progress and other aspects of human living.</p> <p><i>E4: However much the inventiveness of Homo sapiens, or the power of Homo colossus may seem for a while to transcend carrying capacity, nature has the last word.</i></p>	<p>P1: People are masters of their own destiny; they are essentially different from all other creatures, over which they have dominion.</p> <p>P2: People can learn to do anything.</p> <p>P3: People can always change when they have to.</p> <p><i>P4: People can always improve things; the history of mankind is a history of progress; for every problem there is a solution, and progress need never cease.</i></p>

Table 1.9-2: Catton's ecological worldview versus the conventional 'people-based' worldview - Adapted by author from [22]

The folly of the people-centred worldview can be difficult to swallow for many. Understanding that humans are just another species at the whim of the natural world renders a whole host of human attitudes obsolete. This is particularly difficult to reconcile with human society, because, like all other species on earth, evolution has instilled an intrinsic prerogative within humans to constantly expand their own individualistic agendas.

Humankind's social constructs revolve around exuberant expansion, be it the frontier pushing thrusts of empire, the explosive capitalisation of America's youthful 'new world', or the nebulous financial growth of global markets. As we will see in chapter 1.13, when these conditions are not met within a pseudo-evolutionary human society, a whole host of economic and interpersonal issues emerge. As such, pervasive perceptions of humankind's options when faced with ecological reality become common talking points within discourse.

Perception

Humankind's position in nature, while appearing stable and secure, is in actuality subject to the same dynamics as the pond dwelling detritivores, and the humble yeast in the vat. Our population is bloated by the drawdown of billions of tonnes of crude oil, which we are consuming at billions of times the rate of replenishment.

The provision of this gigantic energy stockpile allows us to operate energy budgets far beyond our respiratory systems, but also flushes our environment with waste at accordingly high rates. In the following chapter, we will discuss the actual manifestations of our parallels with the yeast and the pond dwelling detritivores, but presently we must tackle humanity's social reaction to these emerging trends.

Catton created a matrix of human perception towards the consequences of ending the 'age of exuberance'^{*}. This is shown in Table 1.9-3. Across the top of the matrix are the real world circumstances and consequences facing human society; down the left of the matrix are the beliefs in policy or philosophy required to adapt to the perceived scenario.

Perusing the chart, it is very easy to see political parallels in each of the philosophies. The ostrichists and cynics may find their home amongst the most fervent supporters of uncontrolled neoliberal markets; the cosmeticists are the typical new-left supporters of state regulation, strong environmentalism and socialist style government; the cargoists find their place either side of the political spectrum in the technocrats and the science aficionados; while sadly, the realists are likely to be the most fringe and outspoken academics and environmentalists.

Popular opinion within the majority of political and social groups looks upon human civilisation in a manner which is fundamentally naive and non-ecological. Those inculcated into the free-market ideology see the system as a unique and purposeful tool which allows humanity to transcend nature, whilst simultaneously championing the system as an extension of nature itself.

^{*} *Catton uses this term to describe the approximate period around which human society discovered and exploited stockpiled fossil fuel reserves. He also used the term 'The New World' to describe modern, global society.*

<i>Adaptations</i>	<i>Circumstance</i>	<i>Consequence</i>	<i>Name</i>
	The age of exuberance is over, population has already overshoot carrying capacity and prodigal homo sapiens has drawn down the world's saving deposits	All forms of human organisation and behaviour which are based on the assumption of limitlessness must change to forms that accord with finite limits	
Some people realise that the new world is old and that major change must follow	Circumstance Accepted	Consequence Accepted	<i>Realism</i>
Some people have faith that technological progress will stave off major institutional change	Circumstance Accepted	Consequence Disregarded	<i>Cargoism</i>
Some people have faith that family planning, recycling and anti pollution laws will keep the new world new	Circumstance Disregarded	Circumstance partially Accepted	<i>Cosmeticism</i>
Some people do not believe that the new world's 'newness' once did, or that its oldness now does have any significance	Circumstance Disregarded	Consequence Disregarded	<i>Cynicism</i>
Some people insist that the assumption of limitlessness was and is still valid	Circumstance Denied	Consequence Denied	<i>Ostrichism</i>

Table 1.9-3: Catton's matrix of human perceptions - Adapted by author from [23]

However, this misrepresentation of what nature actually is remains a pervasive underpinning of the 'people-based' worldview. Nature is viewed as intrinsically positive, and both environmentally minded statist and free market proponents* will attempt to paint themselves as falling on the 'natural' side of this divide. But is placing nature on such a pedestal a valid stance? Is it correct to argue for a particular action because it is 'natural'?

Getting Back to Nature

It is often the prerogative of environmental groups and socially conscious corporations that some kind of regression to nature is the way out of our

* We have already seen Hayek argue powerfully for the free market as a natural system in *The Fatal Conceit* (see chapter 1.1).

ecological dilemma. If humanity embraced its nature, and the 'natural' ways of doing things, then all would be well with the world. The idea garners genuine interest and discussion in public theatre despite the fact that it is dependent upon what is in essence a misconception of nature.

As we have observed through comparisons with relatively mundane creatures such as yeast and pond detritivores, humanity is as natural as can be with regard to its environmental impact. As a species, our natural behaviour effects our environment in ways which are thoroughly unsurprising in the context of ecology. So why is it that such confusion arises surrounding our future ecological direction? Oddly, the confusion can quite easily be remedied by illustration using Catton's homo colossus.

Supposing that the birth of homo colossus was a genuine speciation event which occurred around the discovery of fossil fuel; a new branch of tech savvy and detritivorous hominids arose. These new hominids came to prominence. Given this hypothetical, it would be unlikely that an environmental movement would urge the species to "get back to nature", as the species would have been dependent upon exploiting technology and drawdown from the outset.

What blurs our direction as an unbroken line of homo sapiens is that our method of obtaining energy and other resources was subject to a radical shift. This shift took us away from living as hunter gatherers and horticulturists, to living as technologically advanced detritivores. What is important is that while our methods have become unconventional, they are in essence identical to before; entirely natural and in keeping with what is learned from ecology and other species. We may go to unusual extremes to obtain our energy and resources, but the underlying principles of ecology are undeniable in their presence.

When an environmentalist speaks of a return to a more natural way of living, what is really being called for is a return to a more historical way of living. As we have seen, our Linnaean wisdom has led to a whole host of unconventional yet ingenious approaches to augmenting carrying capacity. Without this augmentation, it is certain that population collapse would begin to occur immediately, given the vast differences between industrial population levels and the steady capacity seen in early agrarian societies (Figure 1.9-3).

It is not the unconventional way in which we exploit resources that troubles us; instead it is the underlying, individualist phenomena of ecological succession, exuberant growth and drawdown which continually throw species into collapse, regardless of their specific methods. When we accept this truth, we can see that

embracing nature is not a solution, as it is our natural underlying evolutionary and ecological mundanity which brought us to this impasse.

In simple terms; nature is not conducive of a prosperous and unchanging human civilisation as we may envisage. The words of Richard Dawkins, renowned evolutionary biologist, sum up the ineptitude of natural dynamics in creating efficiency and sustainability with minimalist elegance;

"If only all the trees in the forest could come to some agreement... to grow no higher than, say, ten feet, every one would benefit. The entire community – the entire ecosystem – could gain from the savings in wood, and energy, which is consumed in building up those towering and costly trunks."^[24]

We are left in a quandary, as the natural laws which govern us seem to stack the cards against our ability to sustain a prosperous and long term global society. Like the trees who are forced to grow ever higher to one-up their competitors, the yeast who uncontrollably consume their environment to the point of poisoning it, and the detritivores who become hopelessly dependent upon temporary resources, humans are bound by the cruel, individualist laws of ecology. Yet by embracing the cruel natural dynamics of our ecosystem, we can do nothing but succumb to them.

How do other species, who employ naturally capitalistic ideology to their biotic environments fare? The snow lynx in Figure 1.9-1 is the quintessential natural capitalist, but in the absence of an eclectic repertoire of hominid tools to augment carrying capacity, the lynx's society is woefully erratic. Booms and crashes are the spoils of natural life in this case.

Similarly, market oriented economics paints a similar view, as it naively acts to mimic these natural phenomena. A world where human society is defined by sporadic cycles of explosions and contractions is all that any policy based around natural dynamics will bring. Indeed, this is all that it ever brings when we peruse the lives of our peers. We must learn not to follow the lynx. For a society wishing to be all the things that humanity enshrines - stable, long-lasting, peaceful, prosperous - it is clear that nature as we perceive it is not the way forward; we humans must become unnatural.

The Difficulty of an Ecologically Coherent Path

Understanding nature does not lead implicitly to imitation. It is safe to say that through our accumulated millennia of study, that we are able to piece together an

impressive body of knowledge. It is also safe to say that through this knowledge, we have found curious ways to circumvent the dictatorship of nature.

No sane person would leave an arm to become gangrenous because "that is the natural way of things". Understanding the operation of the bacteria in causing the affliction does not bound us to be afflicted. Quite the opposite, a stricken person would likely turn to advanced medicines to fight off the infection and prolong their life in a thoroughly unnatural way.

Through the bleak realism of ecological principles, we can see how nature operates, but it does not dictate how we ought to operate. To understand nature and accommodate for it is an unimaginably more potent approach than to throw ourselves haphazardly upon its whims. Indeed, such an approach has been a stalwart of human scientific betterment since the erection of artificial shelter to protect from the natural threats of the elements.

We must apply this simple yet oft overlooked nugget of reasoning to our ailing system of social and economic interaction. Continued operation of our self directed and pseudo-Darwinian system can only lead to the outcomes of what it attempts to imitate – outcomes of population cycles, erosion of the habitable environment and ultimately succession. Success as a species comes with a price.

So, how exactly do we approach creating a world which is ecologically coherent and conducive of a stable and long term human civilisation? From our gathered knowledge of ecology, the reality of this reduces to understanding and applying three simple, but essential premises:

- An understanding of sustainable resource use, absent of drawdown.
- An understanding of carrying capacity and curbing population growth to align with it.
- An understanding of symbiosis and striving to maintain a diverse and robust ecosystem.

Despite the ecological reasoning which underpins these statements, and the imperativeness of their application for our long term prosperity, our current socio-economic system has great difficulty in accepting their implementation even to a limited degree.

Sustainability instantly throws a spanner into the works by vastly narrowing the spectrum of materials and energy sources available to us. Under such a doctrine, all fossil fuel derived materials are instantly obsolete simply based on their

temporal nature. Materials which are favoured by the engine of modern economics, such as the ubiquitous and cost effective packaging plastics which inundate our lives, are deemed inadequate to depend upon because meaningful volumes are only available by drawdown. Legislation to bring such an economically cataclysmic law into global enforcement is not something that would sit well in a world still obsessed with flexing ill-engorged GDP rather than building a robust and long-lasting society.

Global population is an equally tedious and difficult topic to approach, due to the inherent encroachments upon personal freedom. The one person per child schemes as seen in China are a totally abhorrent and ineffective tool. The disregard for human rights is even more flagrant when we consider that there is an infinitely more powerful and proven weapon for reducing population growth in the scope of economics itself.

There is ample research to support the fact that economic prosperity, well being and crucially education brings birth rates down once a threshold is crossed. The strong correlation between economic prosperity and birth rates is shown in Figure 1.9-6. Bringing equal prosperity and well being to all countries of the world therefore stands as the best bet for curbing population growth in a timely manner, but this is simply impossible in a world which operates in perpetual debt, and functions in the inherently unequal way that we have seen in the previous chapter.

Finally, symbiosis in our natural ecosystem can only be attained and maintained if the environmental impacts of human activity are studiously kept within manageable limits. A pseudo-evolutionary system of individualist prerogatives makes this goal immensely difficult to rectify. It is this incentive system which sends groups of poverty stricken South Americans into the rainforest to cut down trees for lumber to be sold on the billion dollar illegal logging market^[26]. To the lone individualist logger, the decline in the rainforest's ability to capture carbon is of no consequence, as it is a nebulous and tiny trend per log sold. But when the accumulated effects of this trend are accounted for, a starker picture emerges.

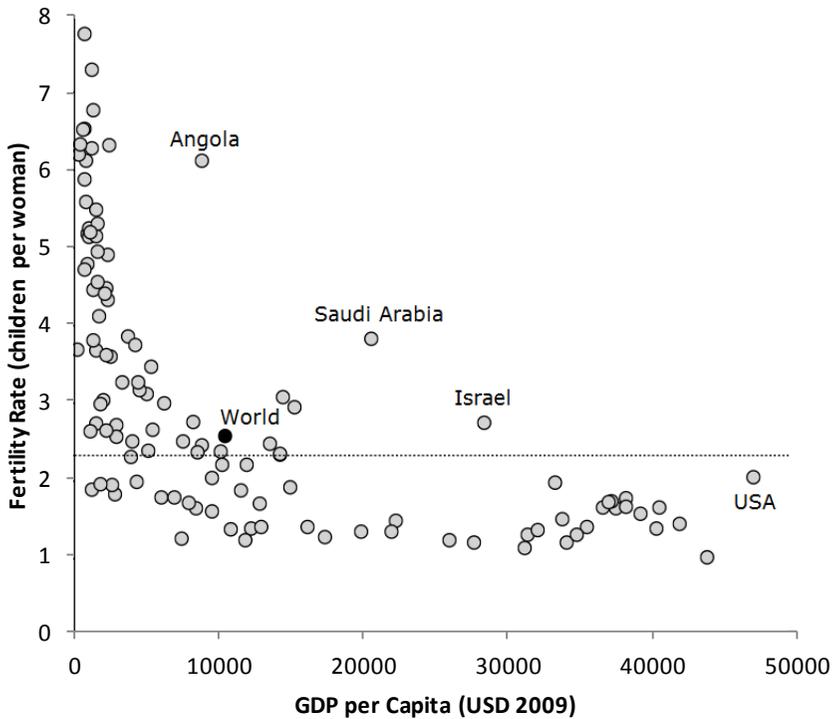


Figure 1.9-6: Plot of global population fertility rates - Adapted from [25]

The cosmeticist's desire for statist environmental regulation within this field is powerless in the face of the strong market incentives that surround illegal logging. As much as 90% of the timber export from South American nations is illegal, supported by corruption, bribery and cartels m^[26]. This trend of pseudo-evolutionary individualist values acting with utter indifference to the environment is echoed in many parallels.

While the farmer may delight in the use of pesticide to cut crop losses, such uses can erode the ability for pollinators to function, and drive their colonies to collapse over a longer term. While the producer may save some money by dumping waste, it is the aggregation of his and his peers' waste which poisons the fish stocks which he depends upon for sustenance. In all cases, carrying capacity is damaged by the inability for individualist paradigms to take account of wider symbiotic value - a natural banality.

This all leads us to the exceedingly hairy question which no one wants to answer: What is the carrying capacity of Earth? I would be a liar if I claimed to know, and even deducing whether we have already overshoot this boundary or

not is a question which is hard enough to answer. But therein resides the problem. If the human race is to have any hope of fostering a long and prosperous civilisation, as one assumes is its prerogative, it must have the most crystal clear vision of what the limits to growth are.

This is simply not something which is even given a cursory thought through the scope of economics. Yet the terrifying thought experiments suggesting that we would need four Earths to supply a current world population at first world lifestyles^[27] suggests that we are too close to critical capacity for comfort. I do not want to venture down the road of discussing the horrors of a global overshoot, so henceforth, we shall approach this issue from a less conservative standpoint; assuming overshoot has not yet occurred, and we have time to do something about it.

Reflections of Ecology within Economics

So how does economic theory grapple with the concept of resource usage, carrying capacity and symbiosis? What rejoinders does the economic community have for those who would claim the individualist paradigm is entangled with potentially catastrophic trends? In order to answer these questions, we must venture back in time.

Although Margaret Thatcher's infamous proclamation, "*There is no such thing as society*" may have ruffled feathers when it was spoken in 1987^[28], the Iron Lady was in fact echoing sentiments which were uttered centuries before. Jeremy Bentham developed his philosophy of the 'principle of utility' in his 1780 publication, *Principles of Morals and Legislation*. The basis of this theory broke all actions undertaken by human beings down into two very simple motives; the avoidance of pain, and the pursuit of pleasure. This simple vision of human behaviour was blithely extrapolated to the society with little reservation.

"The community is a fictitious body, comprised of the individual persons who are considered as constituting as it were members. The interests of the community then is, what? The sum of the interests of the several people who compose it. It is in vain to talk of the interests of the community, without understanding what is the interest of the individual."^[29]

Such sentiments must sound familiar, but they also lay the essential groundwork by which neoclassical economics determines how and why humans consume goods on an individual basis. This is particularly dry reading, (as with most economic prose) but it is none the less important in understanding how the

neoclassical model of value is centred on the individual, and any aggregation of value to the collective level is fundamentally flawed.

The economy from the point of view of the individual is very simple. For a given consumer, each item purchased reflects an increase in that individual's utility, as the access to such an item enabled the human to pursue pleasure or stave off pain. As an example, consider the single individual purchases an orange (don't worry where the orange came from for now).

By consuming the orange, the individual is able to prevent the discomfort of hunger, and as a bonus indulges in the pleasure of the delicious taste. If the consumer however is offered two oranges, the picture gets vaguely more complicated, as the two oranges will each offer less benefit than the single orange did. The oranges will still deliver the consumer additional utility, but the marginal utility of each single orange will be less.

For those of you who may be slightly confused by this, consider the same scenario with a pair of shoes. The first pair of shoes will bring a substantial amount of utility to the consumer, as he or she had previously been barefoot, but if two pairs of shoes were bought at once, each pair would offer less utility than just a solitary pair. However, having two pairs of shoes is still more useful than having just one, so while each pair may offer less utility, the combination of two pairs of shoes grants more utility than the single pair alone. This trend continues forever, following an exponential pattern of diminishing returns - 3 million pairs of shoes are considered marginally more useful than 2,999,999 pairs, but the added usefulness of each pair becomes smaller each time another is added.

If this seems strange to you, good! It is absurd to suggest that consumers behave this way, and that there is no such thing as too many purchases, but this is the basic definition of a single consumer within the lens of modern economic theory*. This model of the consumer is voracious, and if there were no financial limitations on purchasing power, it would simply consume eternally in ever growing amounts.

* *The fullest definition of the economic consumer is even more bizarre, having identical tastes to everybody else and only consuming 'homothetic' goods. (This basically means that regardless of income level, the consumer would spend the same proportion of income on each good.) The logic is clearly not well thought out, as it would suggest that billionaires would spend a similar portion of their weekly budget on pizza when compared to middle or working class people. I am currently unaware of takeaway establishments which charge £10,000,000 per pizza.*

Steve Keen paints the economic representation of a consumer as a mountain climber, constantly striving to get as high up the utility mountain as possible. The first few steps bring the consumer tremendous gains in utility, but as he climbs further on, the incline of the mountain becomes shallower and shallower^[30].

The scenario is further complicated when additional products are available to the consumer. When offered both apples and oranges, the consumer must make a choice between what combination of purchases increases their utility the most.

Staying with the mountain climber analogy, the consumer's sole objective is to get as high as possible up the mountain of utility to maximise the benefit gained. In a two product economy, the consumer has a choice of various different 'slopes' to climb. He may climb a slope consuming mostly oranges and few apples, or vice versa, or a slope of an equal amount of apples and oranges.

Each slope will bring the consumer to the same height of utility, but each will entail a variety of different combinations of goods to get there. Economists were wise to this possibility, and thus created the 'indifference curve' (Figure 1.9-7). Consider an indifference curve as a contour of equal height on the mountain of utility. The consumer can look at the combinations of goods purchased along an indifference curve and not really care which one is best. This could be 5 oranges and 2 apples, 2 oranges and 5 apples, 6 oranges and 1 apple, etc. All combinations of purchases ultimately get the consumer to the same height up the mountain of utility (which is the only goal in this consumer's dull life), and so all other details are irrelevant.

This example up to now has only considered static prices, however in reality, prices are subject to change. What economists are interested in is how the demand for a product changes as prices change. This is the demand curve which we came across in chapter 1.6. Considering a fixed income for the single consumer in our scenario, the demand curve is derived as downward sloping, that is, as the price of apples and oranges rise, demand for the commodities falls*.

If you are still with me, the next part of this simple model is where it becomes interesting, and relevant to the idea of emergent ecological value versus evolutionary individualistic value.

**As we have already seen in chapter 1.6, this entire train of thought is bunkum, as demand curves in reality can take absolutely any shape at all, however it is nice to see exactly how these simple theories are developed.*

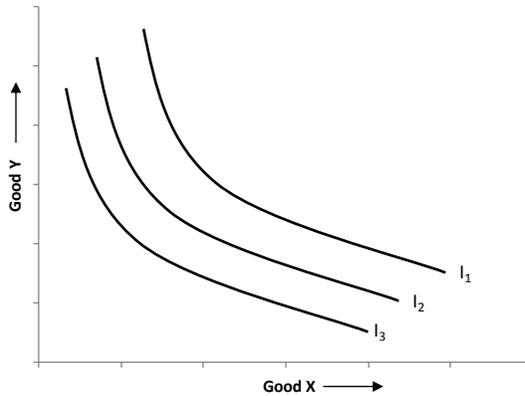


Figure 1.9-7: Indifference curves as interpreted by neoclassical economic theory - Adapted by author from [31]

Let us say that we give our climber a friend, and let us also give each brave climber a name, how about A and B? The imaginatively named A has a flair for apple growing, while the stoic B enjoys cultivating oranges. In contrast to the previous examples where fruit pops into existence and is consumed, what we have developed now is a very simple market economy.

Fortunately, A likes to gorge on oranges and B enjoys the odd apple pie (he is forced to make the crust from oranges). Within the scope of neoclassical theory, the demand curve for the entire market place may be derived by simply aggregating the individual demand curves of each consumer within the market. So theoretically, the demand curve of A plus the demand curve of B will give the market demand curve, which based upon the shape of the consumer demand curve, will be a downward sloping line (higher price, less demand). Now, as the trade of apples and oranges proceeds, the price of each commodity is subject to change, but crucially, so are each of the producer's incomes.

Within a working economy, it is therefore impossible to compartmentalise incomes and prices in the way that it is in a hypothetical single consumer model. As the price of A's apples rise, A becomes richer and becomes more readily able to consume oranges, thus lowering the price of those oranges. It therefore becomes impossible to vary the price of apples independently to oranges, and to keep income constant while varying commodity price.

Even in this incredibly simple example, neoclassical economics fails to derive a demand curve for the market place, as the curve may take any combination of weird and wonderful shapes. If the curve can take such bizarre forms, then there may be more than one level of demand for any given price, and within this theory it is impossible to empirically assess what they are, or even how many of them exist.

This outcome is clumsily known as a Sonnenschein-Mantel-Debreu condition^[32], and it is no stranger to economists. However, rather than redesigning economic thought in light of this error, the synod of economic thought frantically scrambled for additional special circumstances under which the theory holds true. These frankly absurd assumptions are shown in a footnote a few pages earlier. Co-discoverer of the condition, Hugo Freund Sonnenschein, commented on the inanity of these assumptions, and the inability of the theory to give any insight into market demand functions in his book *Handbook of Mathematical Economics*.

“The importance of the above result is clear: strong restrictions are needed in order to justify the hypothesis that a market demand function has the characteristics of a consumer demand function. Only in special cases can an economy be expected to act as an ‘idealised consumer.’ The utility hypothesis tells us nothing about market demand unless it is augmented by additional requirements.”^[33]

Neoclassical economics has ultimately failed in its attempt to model entire economies. While this may seem like a fairly complex series of errors, the truth of the matter is that the fundamental fallacious assumption at the root of this flawed theory is very simple.

The idea that individuals pursuing their own interests will lead to an economy where all interests are safeguarded is a simple analogy for the individualistic incentive system which drives all biotic ecosystems. Neoclassical economics embraces this incentive system, and enshrines it within the all encompassing profit motive. The inability of economic theory to derive explanatory functions for the entire market is simply a reflection of its inability to model emergent phenomena at a collective level.

Worse still, the dogma which props up this bloody and beaten theory refuses to acknowledge that aggregating consumer trends to an entire market is invalid. This is because the ramifications of this failure to account for emergent phenomena and collective value are profoundly far reaching. The fundamental

nature of the profit motive, and its pseudo-evolutionary origins would have to be completely rehashed, and based on a new realm of values. Furthermore, the complexity of emergent phenomena would require theories unimaginably more complex than the simple intersections of lines which economists are accustomed to drawing.

All this is simply too much for economics to bear, and its close tie in with ideologically static political beliefs keeps the church firmly on its foundations. Margaret Thatcher, and Jeremy Bentham before her, were both profoundly wrong in their dismissal of society as an extant entity. The mechanics of society are thoroughly different to a sum of individuals. Rational microeconomic behaviour can and does lead to irrational macroeconomic outcomes.

Returning to Dawkins' forest, we can see that the wastage and effort that the trees have expended in developing their thick trunks may just have well been inspired by neoclassical economic theory. The constant struggle for sunlight deep in the lofty canopy is an inevitable outcome of following the individualist paradigm that is hard coded within evolution by natural selection.

Only by realising that the fundamental cause of our economic woe, and the cumbersome redwood's battle for sunlight with its neighbour are one and the same, can we hope to develop economic theories which truly deliver value.

Conclusions

An ecological view of human society is intriguing and terrifying in equal measure. What we must understand is that humankind is subject to the same natural laws as any other species on the planet, and a very good way to see parallels to human growth is through the eyes of our fellow species.

In order to build a stable, prosperous and long-lasting civilisation, we must understand the laws of ecology. Humans must not draw down resources which cannot be replenished in good time; humans must use the resources that they are afforded in a pragmatic and sustainable manner; and humans must respect that their existence is intertwined with other organisms that must prosper at our side.

Human civilisation must understand these natural laws and use them to its advantage, but it must not blindly mimic the prerogatives it sees in natural ecosystems. Just like the lynx and the hare, and countless other examples in nature, humans following short sighted, individualistic systems of incentive are likely to see their carrying capacity wane, and their population collapse. The market incentive is staunchly in-keeping with these natural prerogatives, as

many of its most eloquent champions have argued, but this is not necessarily a beneficial stance.

Almost all of our major institutions, political stances and economic philosophies fail to grasp these fundamental truths, rigorously confirmed through ecology. The focus on the market as the vehicle of prosperity, with the state as the regulatory referee is a hard impediment to any meaningful discussion on this topic. The upshot of these combined criteria result in a stern indictment of the market incentive system as an adversary to a prosperous, long-lasting human society.

Chapter 1.9 - References and Notes

- [1]. William R. Catton, Jr., *Overshoot, the Ecological Basis of Revolutionary Change*, University of Illinois Press; (1 Jun. 1982), pg 155
- [2]. Bang Goes the Theory, BBC One - 03/12/2009
- [3]. Harald von Witzke, Steffen Noleppa, Inga Zhirkova, *Meat Eats Land*, World Wildlife Fund, Study D, 2011
- [4]. *Ibid*
- [5]. *Annalen der Chemie und Pharmacie*, 1840–1872
- [6]. William R. Catton, Jr., *Overshoot, the Ecological Basis of Revolutionary Change*, University of Illinois Press; (1 Jun. 1982), pg 158
- [7]. Tim Lang, Michael Heasman, *Food Wars: The Global Battle for Mouths, Minds and Markets*, Routledge (1 Aug. 2004), pg 241
- [8]. Carl-Christian Schmidt, *Fisheries and Japan: A case of multiple roles?* OECD, 2003
- [9]. European Parliament, *Europe's Deficit in Compound Feeding stuffs and Agenda 2000*. Agriculture, Forestry and Rural Development Series, Working Document, A GRI-110, February 1999
- [10]. Geoff Tansey, Joyce D'Silva, *The Meat Business: Devouring a Hungry Planet*, Earthscan Publications Ltd.; 1st edition, January 15, 2000, pg 1241
- [11]. Arthur Boughey, *Man and the Environment*, Macmillan (1971), pg 9
- [12]. D. A. MacLulich, *Fluctuations in the numbers of the varying hare (Lepus americanus)*. University of Toronto Studies Biological Series 43. University of Toronto Press, Toronto, 1937
- [13]. David de la Croix, Davide Dottori, *Easter Island's collapse: a tale of a population race*, J Econ Growth (2008) Vol 13, pp27–55, also, Jared Diamond, *Collapse: How Societies Choose to Fail or Survive*, Penguin, 30 Jun 2011
- [14]. Data taken from CIA Global Factbook
- [15]. John M. Olson, *Photosynthesis in the Archean Era*, Photosynthesis Research, May 2006, Volume 88, Issue 2, pp 109-117
- [16]. Heinrich D. Holland, *The oxygenation of the atmosphere and oceans*. Philosophical Transactions of the Royal Society: Biological Sciences. 361, 2006, pp903–915

- [17]. J. E. Lovelock, L. Margulis, *Atmospheric homeostasis by and for the biosphere: the Gaia hypothesis*. Tellus. Series A (Stockholm: International Meteorological Institute) 26 (1–2): 1974, pp2–10.
- [18]. Toby Tyrrell, *On Gaia: A Critical Investigation of the Relationship between Life and Earth*, Princeton University Press
- [19]. Thomas Robert Malthus, *An Essay on the Principle of Population*, J. Johnson, London, 1798
- [20]. William R. Catton, Jr., *Overshoot, the Ecological Basis of Revolutionary Change*, University of Illinois Press; (1 Jun. 1982), pg 218
- [21]. *Ibid*, pg 245
- [22]. *Ibid*, pp238-239
- [23]. *Ibid*, pg 70
- [24]. Richard Dawkins, *The Greatest Show on Earth: The Evidence for Evolution*, Black Swan (29 April 2010), pg 378
- [25]. Data taken from CIA World Fact Book
- [26]. Marilyne Pereira Goncalves et al, *Justice for Forests: Improving Criminal Justice Efforts to Combat Illegal Logging*, International Bank for Reconstruction and Development, The World Bank, 2012
- [27]. Charlotte McDonald, *How many Earths do we need?* BBC News, 16 June 2015 - <http://www.bbc.co.uk/news/magazine-33133712>
- [28]. Douglas Keay, *Aids, education and the year 2000!* [Interview with Margaret Thatcher], *Woman's Own Magazine*, Sep 23 1987, pp8-10
- [29]. Jeremy Bentham, *An Introduction to the Principles of Morals and Legislation*, London, 1780
- [30]. Steve Keen, *Debunking Economics*, Zed Booms Ltd. 2011, pp 43-46
- [31]. *Ibid*, pg 49
- [32]. *Ibid*, pg 53
- [33]. W. Shafer, and H. Sonnenschein, *Market demand and excess demand functions*, *Handbook of Mathematical Economics*. K. J. Arrow and M. D. Intriligator, Elsevier. 2: 1993, pp671-693

1.10 Overshoot I - Ecological Decline

WITH AN UNDERSTANDING of the ecological issues which go so criminally unnoticed by the populace, it is prudent to dwell on this point for a further chapter or two. Rather than a theoretical explanation of the principles of ecology and our addiction to drawdown, the following pages are set out as a perusal of the global ecosystem as it stands today, and how the phenomena which we are observing are entirely predictable when viewing humanity ecologically.

In 1896, Svante Arrhenius, famed Swedish scientist and rector of Stockholm's Högskola derived an unassuming formula relating changes in atmospheric temperature to infrared absorption by carbon dioxide. In its word form, his formula reads:

“...if the quantity of carbonic acid increases in geometric progression, the augmentation of the temperature will increase nearly in arithmetic progression.”^[1]

The idea was ridiculed at first, in particular by fellow Swede, Knut Ångström, who had successfully mapped out the absorption bands within the infrared spectrum of CO₂. Arrhenius however was unrelenting, and continued to toy with the idea that the concentration of CO₂ within the atmosphere could not only control temperature, but also be harnessed to mitigate the effect of ice ages and warm the Earth to more temperate climes^[2].

He did not know it, but Arrhenius had stumbled upon a physical phenomenon which would still be of significant relevance and controversy over a century later. Based upon his theories, vast bodies of policy would be built which would dictate how machines are designed, what fuels are used within them and how much people would have to pay if they did not adhere.

On the other side of the fence, anger and resentment would bubble and discard the Arrhenian proclamations as junk science or conspiracy. Climate change had

arrived, and what to do about it, whether we were responsible, and if it was even real at all would become polarising questions in the modern forum.

The minefield of climate change is an extremely difficult one to negotiate, and even more so if wishing to cross with intellectual honesty. The heavily politicised and hotly contested debate is fought fervently on both sides by parties with deep running vested interests. Trying to stay afloat in this sea of warring leviathans is challenging, especially when faced with the seductive sound bites of the talking head du jour, proclaiming that you should either push for the arrest of climate scientist fraudsters, or immediately sell your coastal home and run for the hills.

I am not going to attempt to cover all of the material here, as the sprawling library of science papers, and the strident political lobbyism which accompanies this story is worthy of several books alone. If you however are interested in delving deeper into this fascinating and ever growing rabbit hole, there are a great body of books which go into much more detail than will be summarised here.

What is important to consider however is that, from an ecological perspective, the destabilisation of our environment due to the effect of our excremental emissions is old hat, and comes to be expected. When provided with a near endless resource to drawdown, we are analogous to yeast in a winery vat, and like all other creatures under these exuberant circumstances, will gorge ourselves until we drown in our own waste.

Introduction to the Greenhouse Effect

The greenhouse effect is a prerequisite for life. The existence of life on our world owes much to the fluffy cushion of air and water vapour which shrouds it. Without such an insulating buffer, all heat provided from the sun would simply radiate back into space, leaving the Earth cold and inhospitable.

Conversely, the greenhouse effect of an atmosphere is of a Goldilocks nature, and while too little would leave our planet a frozen ball, too much would render it unimaginably warm. Earth's sister planet Venus is of significance here, as it is a prime example of the greenhouse effect in action. Venus receives just 25% of the solar energy received by the sun's closest neighbour, Mercury, yet sustains surface temperatures which are far hotter.

The complexity of a planetary atmosphere is however much more intricate in the detail. Clouds of water vapour and other airborne gases reflect energy away

before it reaches Earth, while other gases allow certain wavelengths through, but retain them when reflected or emitted from the surface. Figure 1.10-1 shows the typical workings of the atmosphere when interacting with solar energy.

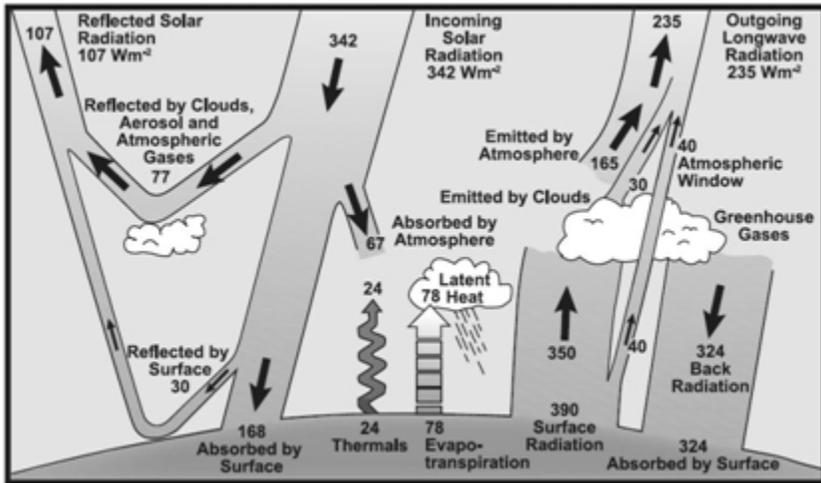


Figure 1.10-1: Atmospheric energy balance. Adapted by author from [3]

As the figure shows, in a typical 'unit' of atmosphere, energy from the sun penetrates to the surface causing it to warm. Heat is radiated back into space via various means, but in some cases gases absorb the heat instead, retaining some of the solar energy as warmth. These are known as greenhouse gases for obvious reasons, and water vapour is just about the most effective gas in our atmosphere at performing this task.

However, other gases are capable of absorbing surface radiated heat in similar manners, though less effectively than water vapour. Methane is a fairly potent greenhouse gas, but the most talked about in current forums of debate is the innocuous carbon dioxide. Carbon dioxide is not actually a terribly good greenhouse gas in comparison to the likes of methane and water vapour, as shown below in Figure 1.10-2.

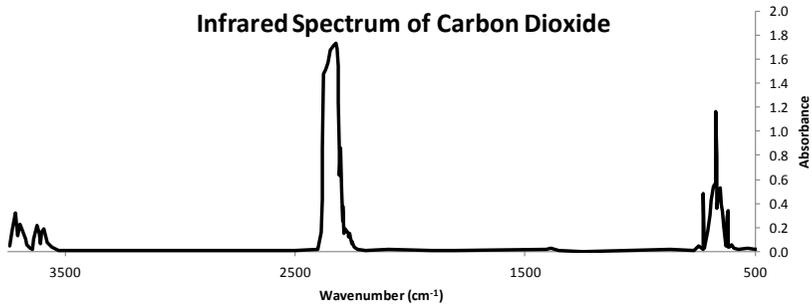


Figure 1.10-2: Absorption spectrum of carbon dioxide - Adapted by author from [4]

As shown in Figure 1.10-2, carbon dioxide absorbs most infrared radiation in one large clump, with secondary and tertiary absorbance peaks at other wavelengths. This means that CO₂ is only able to absorb heat which is radiated from the surface within these peak locations; a logarithmic effect with increasing levels of CO₂ concentration.

This means that increasing CO₂ in the atmosphere will yield diminishing returns to increasing temperature, as the amount of back radiated surface heat within the absorption band will remain approximately constant. Once CO₂ is absorbing all of this energy, it will not have any further effect on warming.

However, we are not out of the woods by way of this absorption perk of carbon dioxide, as given numerous unknowns and uncertainties, it is difficult to accurately suggest where this plateau of CO₂ greenhouse effectiveness is; both in terms of emissions and temperature rise.

Regardless of uncertainties, the emissions of carbon dioxide, as well as other greenhouse gases correlate very well with our development and growth as an industrial species, as Figure 1.10-3 suggests. It is observed that around 1800, the emission of greenhouse gases of all forms begins to accelerate exponentially.

The industrial revolution, and the exploitation of cheap drawdown fossil fuel is the primary recipient of blame for this exponential rise, but other factors relating to our exuberant explosion are of significance, such as methane emissions by an increasingly large agricultural livestock population^[5] or carbon emissions by deforestation for land and timber^[6].

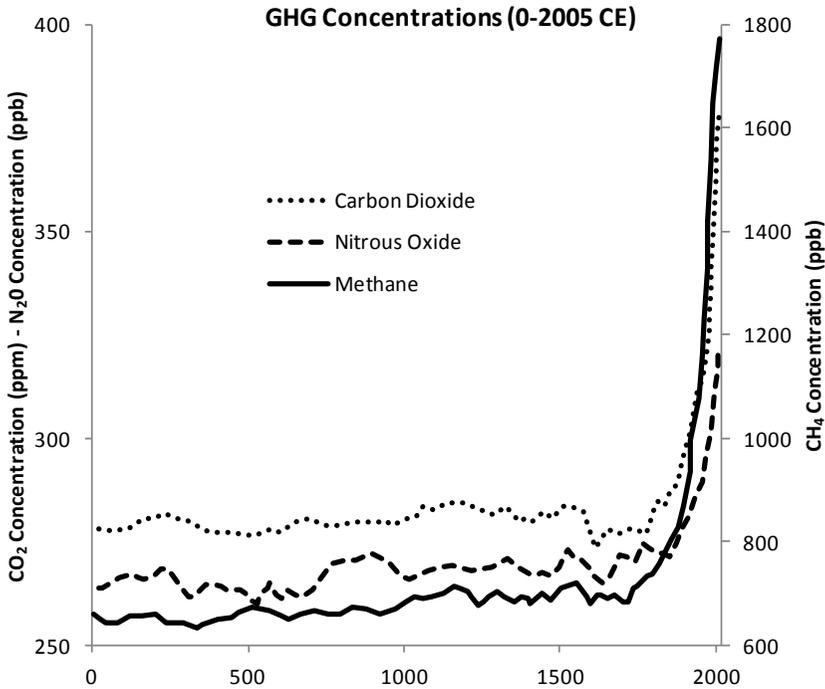


Figure 1.10-3: Correlations of greenhouse gas emissions over time - Adapted by author from [7]

Needless to say, the emission of CO₂ and other greenhouse gases are entirely predictable through an ecological view of human society. Our waste may be primarily through our industrial lungs, and via other indirect features of our population growth, but the general trend of proceedings is reminiscent of yeast in a winery vat. Whether this particular specific in our portfolio of waste products is the one which will render our civilisation untenable is up for debate, but the trend of warming none the less offers some interesting commentary which will be covered presently.

A Trend of Warming

In terms of basic physics, emission of a greenhouse gas allows the atmosphere to absorb more heat, thus resulting in less heat radiating into space. Climate is however anything but simple, and there are numerous other factors to be considered alongside the basic physics.

Shown in Figure 1.10-4 is a plot of the global temperature change over the past century. The data is taken from NASA's Goddard Institute for Space Studies (GISS), although data available from other leading climatic bodies such as the U.S. National Climatic Data Center, the Japanese Meteorological Agency and the UK Met Office Hadley Centre shows the same trend.

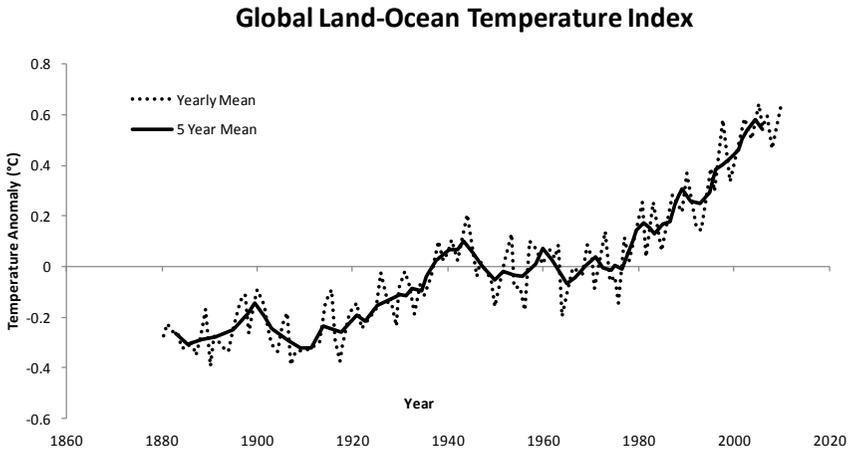


Figure 1.10-4: Graph of global temperature index - Data taken from [8]

The trend toward global warming is fairly clear; however the period between the beginning of the 1940s and the mid 1970s seems to counter what common sense tells us about CO₂ emissions. This period demonstrates a subtle, but very clear cooling trend, and it occurred in a world in which CO₂ emissions were undoubtedly rising.

As with all climate related phenomena, the answer here is not straight forward. It is a result of the changing magnitude of factors affecting the climate at a given time. These factors which affect the climate are known as forcings, and the magnitude of various forcings in relation to one another can produce complex results which are not always obvious.

Figure 1.10-5 shows a variety of forcing effects used in the United States Department of Energy parallel climate model. Each of the forcings represents a natural phenomenon which either has a cooling or warming effect upon the climate. In the case of this figure, the forcings considered are:

- *Volcanic Activity* – Increased volcanic activity emits CO₂, but also dust and dirt imbued with sulphates. CO₂ emitted causes slight warming, and the effects of sulphate particulates prevent solar radiation from reaching the surface, resulting in a mild cooling effect.
- *Sulphate Aerosols* – As above, however the effect of anthropogenic emissions of sulphate aerosols are also considered.
- *Ozone* – Ozone is also a greenhouse gas, and increased ozone results in a warming effect. Depletion of the ozone layer causes a weak cooling
- *Solar Irradiance* – The sun's output can vary with sunspot activity. Increased solar activity produces, warming and reduced activity causes cooling.
- *Greenhouse Gases* – Emission of GHGs causes warming by the mechanism already described.

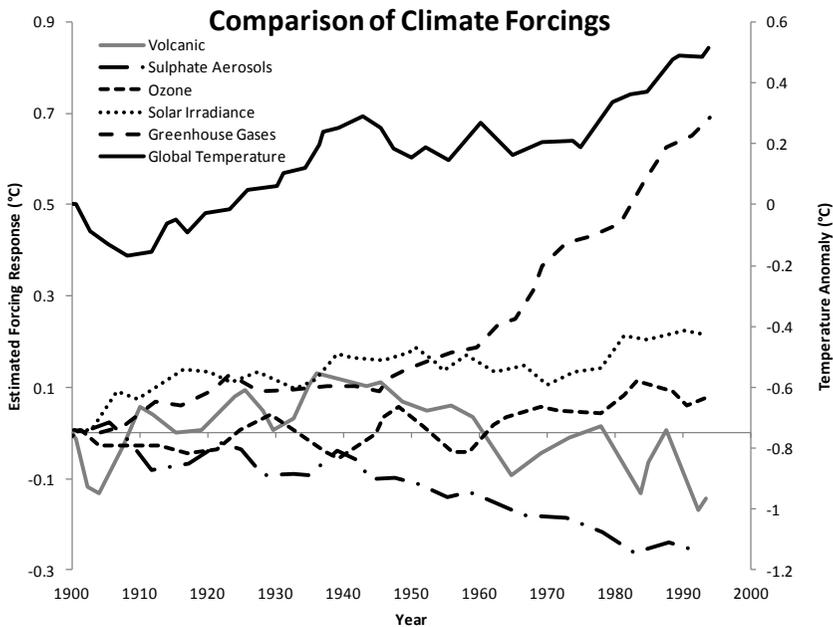


Figure 1.10-5: Comparison of climate forcing effects over time - Adapted by author from [9]

The figure shows that over the 1940 - 1970 time period, solar irradiance increased slightly, and the effect of ozone remained approximately constant. However, volcanic activity around the eruption of Santorini in 1950 caused a subtle cooling effect, which was visibly reinforced by the eruption of Mount

Agung in 1963. Increasing anthropogenic aerosol emissions beginning in the 1930s further reinforce this cooling.

However, up until the mid 1950s, the effect of greenhouse gas emissions is inferior to that of solar irradiance. Into the 1960s, greenhouse gas becomes the dominant warming forcing, and by the 1970s is significant enough to offset the cooling effects of increased volcanic activity, and increasing anthropogenic aerosol emissions.

Even more interestingly, the 1940s cooling trend seems to be further exaggerated by a discontinuity within the temperature record. Around the end of the Second World War, sea temperature data began to be obtained through usage of special canvas water probes. Hitherto, temperature recording approaches had varied significantly from ship to ship and fleet to fleet, but generally involved the usage of a more simplistic wooden bucket probe. The splicing of these datasets together in order to produce an overall trend is argued in Thompson et al to exaggerate the cooling of the period, due to the insulating effects of the canvas design^[10].

This is an important point in the perusal of climate data, as the further back we go to obtain temperature records, the more indirect and abstract the methods must become. It is therefore important to emphasise very large datasets and long time periods in order to obtain the most comprehensive picture. It also should be underlined that these forcings are estimated on the basis of computer modelling, as there is currently no certain way to quantify the effects of these complex phenomena.

The usage of these forcings is validated against the DOE Parallel Climate Model, which is able to recreate the temperature trends of recent decades to an adequate degree of accuracy. This does in no way suggest that these forcing values are correct, merely that they represent a reasonable assumption of the atmospheric phenomena. The exact effect of aerosols upon climate and cloud formation remains a topic of debate within climatology.

Further Back – Unravelling Nature's Role in Warming

We are now gathering a clearer picture of mankind's complex effect upon the environment through our evolutionary exuberance. However, the possibility that warming is attributable to natural processes is one which cannot be dismissed. In order to assess this, climatologists must look at data over much longer time periods. Obviously going back hundreds of thousands of years presents a difficulty in obtaining data, as there were no humans to record such information.

To estimate temperatures from these periods, indirect measurements are used by examining the trapped air within drilled ice cores, the variation within tree rings or the growth rings within coral reefs.

Using these data sets, a reconstruction of past temperatures may be developed, again using larger collections of data to reduce the considerable uncertainties. Using data available online from the United States National Oceanic and Atmospheric Administration (NOAA), Figure 1.10-6 shows a reconstruction of temperatures going back a maximum of two thousand years. For completeness, the plot includes labelling of the Medieval Warm Period (MWP) and the Little Ice Age (LIA).

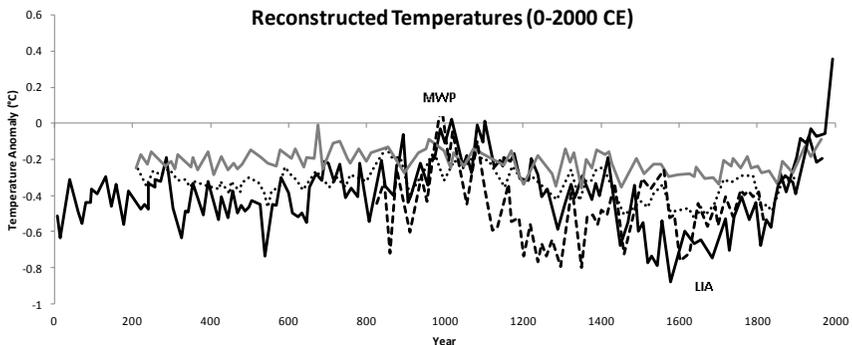


Figure 1.10-6: Reconstructed temperature records - Data taken from [11]

Based upon the plot above, we again have some results which are counter intuitive. The Medieval Warm Period displays significant warming in some regions, despite being in an era when man-made CO₂ emissions were negligible. It is then immediately followed by a noticeably cooler period, dubbed the Little Ice Age. Due to these seeming discrepancies in the temperature record, this period has attracted significant attention from sceptics of climate change.

The literature however explains this trend quite well. While local temperatures increased during the Medieval period, the global average remains substantially cooler than today. It instead is argued that the period is attributable to changes in the North Atlantic Oscillation cycle (a cycle of slowly fluctuating pressure over the Atlantic ocean). The Little Ice Age also correlates nicely with a period of very low sunspot activity known as the Maunder Minimum, occurring around 1650 to 1700^[12].

In the great scheme of things, the past two millennia is still a fairly limited view of the history of the Earth's atmosphere. Based on ice core data alone, it is possible to venture back by several hundred thousand years to see if the warming we are experiencing now is actually a long period natural cycle. A plot of the atmospheric CO₂ level across the past 400 thousand years is shown in Figure 1.10-7.

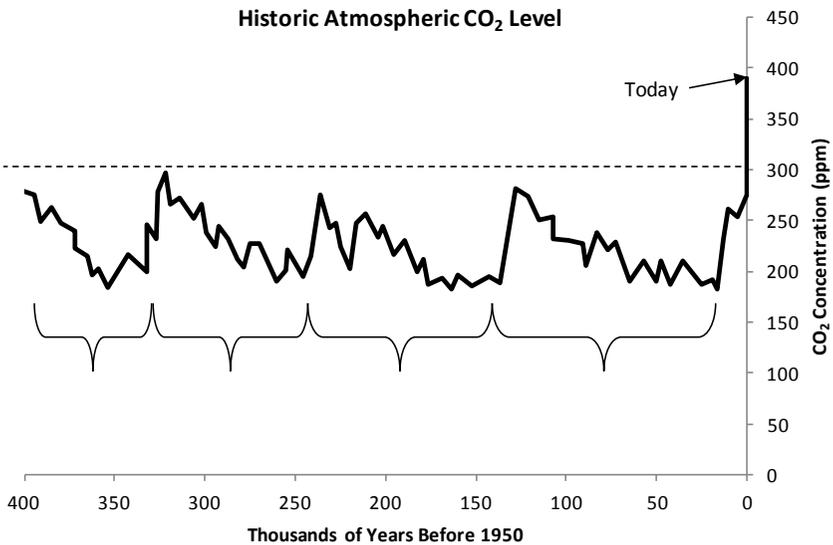


Figure 1.10-7: Long term carbon dioxide atmospheric concentration - Adapted by author from [13]

The graph depicts fairly regular cycles of carbon dioxide rise and fall over an approximate 100,000 year period, corresponding with glacial periods, colloquially known as 'ice ages'. When the Earth's climate warms naturally, the sea releases copious amounts of stored CO₂ into the atmosphere. When the seas are cooler, CO₂ is more readily absorbed and atmospheric levels fall.

These glaciation cycles are commonly known as Milankovitch cycles*, and are interesting in their origin. The Earth's elliptical orbit around the sun is not of a constant shape, and changes in eccentricity over the course of around 100,000 years. This is due to the effect of other large gravitational bodies within the solar

*Studies have also shown that the cycles may actually find their origin in as yet unobserved 100,000 year long changes in solar output^[14]. Either way, it is agreed that the current changes to our climate are too rapid to readily attribute to these causes.

system, notably the gas giants Jupiter and Saturn. In addition to the orbital shape, the precession of Earth's axis and its inclination are also subject to cycling at 26,000 and 41,000 years respectively^[15].

The effects of these cycles upon one another are complex and will not be covered here, but the cycles of glacial periods show good agreement with the Milankovitch changes in Earth's orbit. What is especially interesting here is how these cycles influence both sea and temperature. A plot of this is shown in Figure 1.10-8.

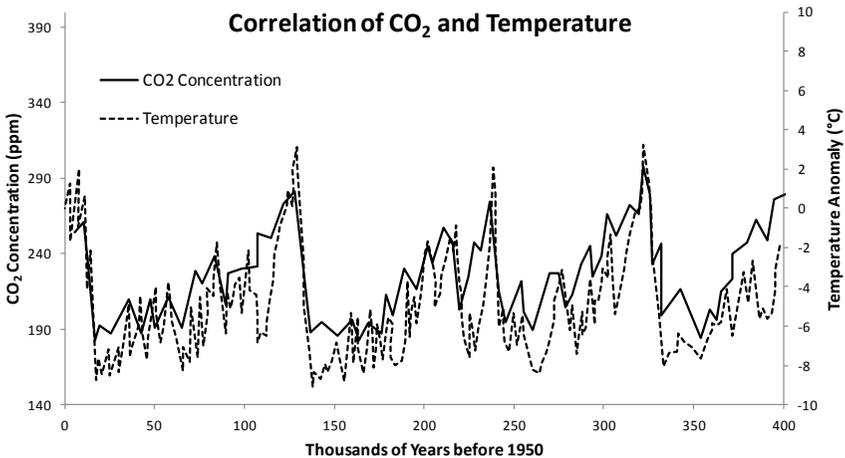


Figure 1.10-8: Long term carbon dioxide and temperature (Milankovitch cycles) - Adapted by author from [16]

Keen eyed readers will spot that there is a noticeable lag between the rise in temperature and the emission of CO₂ in the above figure. This suggests that natural warming drives a natural increase in CO₂ emission. This argument is therefore often wheeled out as a talking point against the idea of anthropogenic global warming, but as with most things climate-related, nothing is simple here.

We have briefly covered the ideas of forcing effects in the previous subsection, and how the differing relative magnitudes of forcings can cancel out, reinforce each other or dominate the system. Within a Milankovitch cycle, the increase in solar irradiance is actually relatively mild, and certainly not enough on its own to cause the wild ice age swings which are observed.

The reason for the significant jumps in climate between glaciations and interglacial periods is in part due to the aforementioned 800 year lag in the

release of CO₂ into the atmosphere. Under these circumstances, the change in solar irradiance is the dominant *forcing* effect driving the temperature rise, but it is reinforced by the *feedback* effect of CO₂ release, mainly from oceans.

The slight increase in temperature due to Milankovitch phenomena prompts more CO₂ to be released, which in turn reinforces and accelerates the warming effects via its greenhouse properties. Conversely, the same is true of the cooling part of the cycle; the subtle reduction in solar heating due to Milankovitch effects allows the seas to cool and sequester CO₂ more effectively, thus reducing the greenhouse effect and allowing more heat to radiate into space.

It must be noted that this feedback system does not absolve us from responsibility. The effect of greenhouse gases may be both a feedback and a forcing effect, simultaneously if the situation demands it. This means that warming of the planet via an anthropogenic CO₂ forcing may become significant enough to cause the oceans to release CO₂ as an additional feedback effect, accelerating and reinforcing the warming trend.

It should also be added that while the Milankovitch cycle is the commonly cited reason for these cyclic glaciation events, it is also possible that the sun is responsible via a mechanism which has not yet been fully understood. Either way, the increase in temperature and CO₂ which is occurring today is not easily attributable to either of these causes, due to the predictability of orbital cycling and the accurate satellite data which suggest the sun is not warming, as we will review presently. What is clear is that the driving factor of our current climate is CO₂, anthropogenic or otherwise. This is explained using Figure 1.10-9.

Figure 1.10-9 shows the correlation between the sun's output and the temperature trends observed on Earth. Note that both temperature and solar irradiance are expressed as 11 year averages because of the natural solar sunspot fluctuations, which occur in approximate 11 year cycles. The initial portion of the graph is fairly easy to follow. Temperature tracks the average solar output trend quite well. However around 1970 (indicated by a vertical dotted line), the solar irradiance begins to enter an average decline, while the global temperature begins to rise.

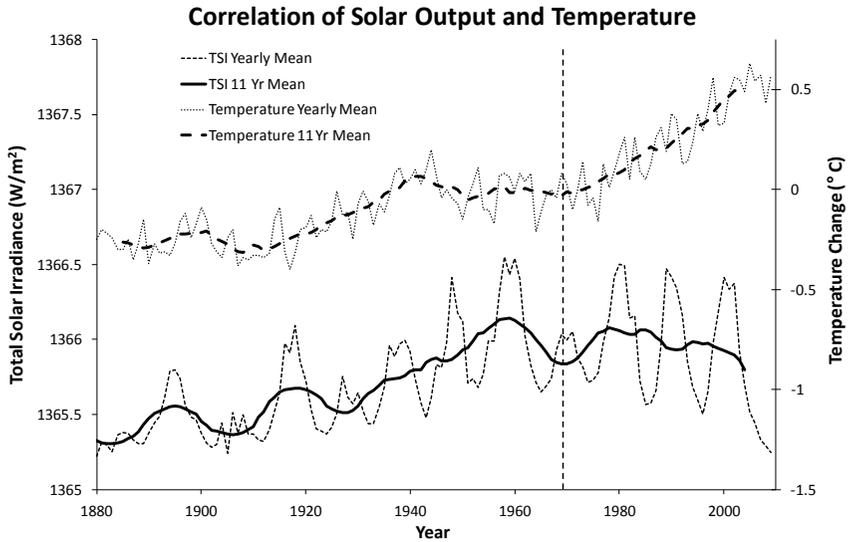


Figure 1.10-9: Plot of solar output and global temperature - Data taken from [17]

The period around the 1970s has already been indicated in Figure 1.10-5 as the approximate point at which the emission of greenhouse gases became one of the more potent forcings affecting climate. It is therefore safe to assume that the warming trend beyond the 1970s, in lieu of any extra solar forcing is attributable to CO₂ emissions.

It seems to be relatively clear at this point that CO₂ has a potent effect upon global temperature, and appears to circumstantially correlate with human industrial activity, as ecology would suggest. However, it must also be considered that over even longer time periods, CO₂ concentrations within the atmosphere have been far higher than today. How do these factors tie in with the ideas already presented, and what phenomena allowed high levels of CO₂ to occur naturally in the past? This is shown in Figure 1.10-10, using a combination of modelling and smoothed data from indirect sources.

Accounting for uncertainty in modelling and proxy data, the CO₂ levels may have been as high as 7,000 parts per million (an order of magnitude greater than today) around 500 million years BCE. This period marks the approximate beginning of the current Phanerozoic eon, which is actually the first eon to yield complex creatures able to leave fossilised remains.

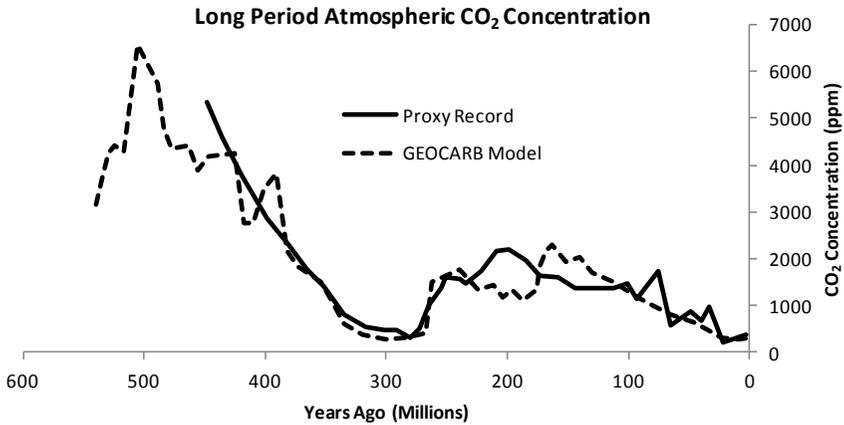


Figure 1.10-10: Very long term CO₂ atmospheric concentrations - Adapted by author from [18]

So a high carbon atmosphere does not always result in dire consequences for lifeforms due to warming it seems. Once again however, we must return to the idea of forcings to explain this seeming conundrum.

The solar output of the sun approximately 4.7×10^9 years ago has been estimated at around 70% of its current luminosity, and has increased fairly linearly ever since. This slight solar warming trend is not noticeably significant in the timescale of thousands, or even hundreds of thousands of years, but venturing back over half a billion years to the dawn of the Phanerozoic is a different story. It is probable that the output of the sun at this time was significantly less than today, and as such, far higher levels of CO₂ induced greenhouse warming could be possible without severe implications^[19].

The logarithmic effect of CO₂ (as we have discussed earlier) may also have been of relevance during these ancient periods, as the very high level of CO₂ may have had little effect upon warming above a certain threshold. Therefore, to say that CO₂ is of no concern today due to these phenomena seems to err on the side of risk rather than caution.

To compare similar CO₂ levels to today, while retaining a similar solar output, we may venture back to the relatively recent Pliocene era, a period around 3 million years ago. CO₂ levels during this era remained at around 365 to 410 ppm for thousands of years.

Arctic temperatures were 11 to 16°C warmer^[20], while global average temperatures were around 3 to 4°C warmer than the pre-industrial era. Additionally, sea levels were around 25 metres higher than currently^[21]. The argument that high CO₂ levels are natural and benign therefore does not seem to be an argument that we can safely rely upon.

So, given the wealth of evidence surrounding human activity and rising CO₂ levels, what can we realistically predict about the future? Are we indeed doomed as per the humble yeast, innocently consuming our abundant energy in individualistic evolutionary exuberance, not realising that our industrial excrement is gradually rendering our environment inhospitable? Or is this all alarmism, and the market will find a way to innovate around these circumstances through new technologies and business models?

Potential Effects

To continue to emit CO₂ and other greenhouse gases at ever increasing rates seems to be an approach laced with risk. But exactly what risk can we expect to endure should we steadfastly demand to stay rooted to the path of business as usual?

Projecting and predicting the exact outcomes of a changing climate are difficult, but generally only due to uncertainty in scale rather than confusion over what phenomena will manifest. Several threatening issues are obvious from a fundamental view, and some of these are already beginning to rear their heads to a limited extent.

One particular item which falls into certainty of occurrence, but uncertainty over scale is the idea of rising sea levels. Figure 1.10-11 shows a collection of real world data and climate modelling tracing the historical sea levels over the past two millennia. The trends show mild to vigorous sea level rise through the medieval warm period, followed by a plateau and subtle decline across the Maunder Minimum. The period around 1900 however does seem to exhibit the heel of a very rapid rise in sea levels. Given the numerous other phenomena which seem to exhibit divergence at this time, it follows to attribute this sea level rise to the current warming.

Projecting further into the future is difficult, but through various modelling techniques, sea level rises by 2100 have been roughly computed given various scenarios of economic growth, population growth and dependence on fossil fuels. These are shown in Figure 1.10-12.

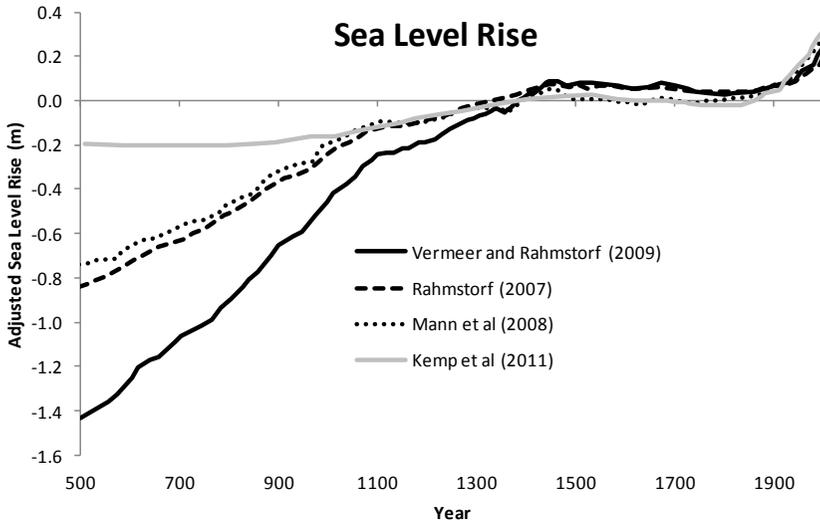


Figure 1.10-11: Sea level rise over the past two millennia. Adapted by author from [22] - Kemp et al data reconstructed from proxy sources in North Carolina; Vermeer and Rahmstorf (2009)^[23], Mann et al (2008)^[24] and Rahmstorf (2007)^[25] all modelled based on global temperature records.

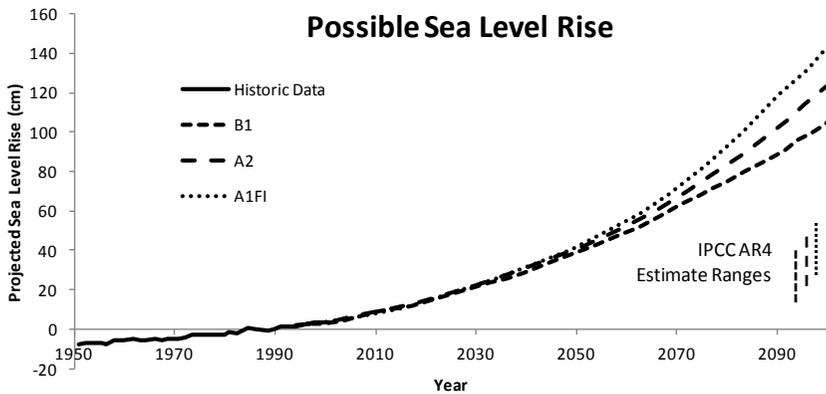


Figure 1.10-12: Graph showing predicted rises in sea level by 2100. B1, A2 and A1FI represent different global development scenarios, where A1FI is a world with strong economic growth and fossil fuel dependence, B1 a world with gradually declining population and a much less resource intensive economy, and A2 a world which generally speaking lies somewhere between. Also shown are the IPCC estimates for these scenarios - Adapted by author from [23]

The Intergovernmental Panel on Climate Change (IPCC) has produced official maximum increases in sea levels by 2100, which are estimated at 60cm for the A1FI (strong economic growth, large population and fossil fuel intensive

economy) scenario. Other sources however have shown sea level rise under this future outcome at anywhere between 1.0 and 2.0 metres^[26].

However large or small the sea level rise may be based on modelling and temperature correlation, evidence suggests that we may be more justified in erring on the side of caution than originally suspected. Figure 1.10-14 shows the projected decline in sea ice by 2100, aggregated using a wide variety of models and approaches.

Overlaid is the observed decline in sea ice during the period up to 2010. What is worrying here is that the models appear to be grossly underestimating the decline in sea ice, and thus the rise in sea levels. This suggests that the IPCC's projections may fall short of the actual observable decline.

We must not be quick to jump to alarmism based upon this trend however, as Antarctic sea ice is observed to be increasing. However, the warming of the southern ocean suggests that this is not a hole in the idea of global warming as a whole, but rather a function of complex ocean dynamics^[27].

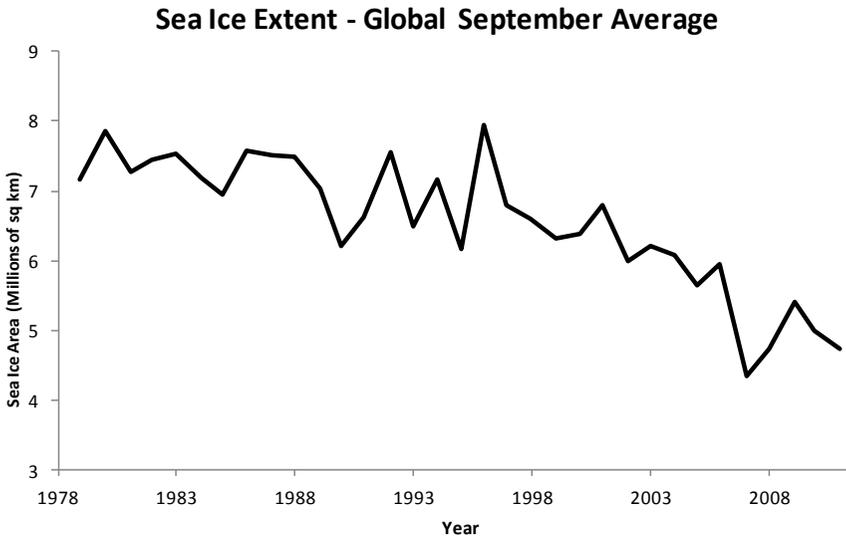


Figure 1.10-13: General sea ice average - Data from [28]

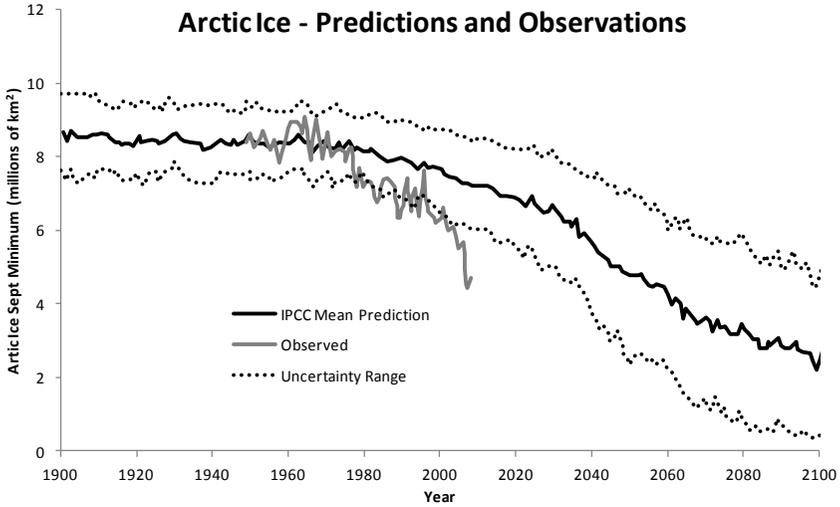


Figure 1.10-14: Decline in sea ice as observed and predicted by IPCC. Adapted by author from [29]. Addition of data up to 2008 from [30]

However accurate these rising sea level projections are, human inhabited low elevation coastal zones (LECZ) face challenging futures. Even with an optimistic sea-level rise of just 38 cm, risk of flooding during storm surges would increase fivefold^[31]. A tabulation of the land and populations at risk from this rise is shown in Table 1.10-1.

	Population (millions)		Land (Thousands of km ²)	
	Total	Urban	Total	Urban
Africa	56	31	191	15
Asia	466	238	881	113
Europe	50	40	490	56
Latin America	29	23	397	33
Australasia	3	3	131	6
North America	24	21	553	52
Small Island States	6	4	58	5

Table 1.10-1: Populations and land areas within the LECZ. Adapted by author from [32]

What is concerning here is the sheer number of people who would be affected by rising tides. The regions at risk hold just 2 percent of the world’s land area, yet account for about 10 per cent of the world’s population, and 13 percent of the

world's urban population. Asia is of particular concern, as it holds about three-quarters of the population zones at risk.

However, wet ankles and rising water levels are just one end of the spectrum with regard to the possible problems we will face in a warmer world. The latest drought in Texas has alluded to just how dependent we are upon adequate weather to produce goods as eclectic as cotton and grain, with a 50% rise in winter wheat prices projected^[33].

Climatologist, John Nielsen-Gammon has plotted the properties of the unprecedented Texas drought against data going back into the 1800's in order to illustrate the extremity of this particular summer. What is interesting about this is that while 2011 is a pronounced outlier, the difference in temperature from what would be a freak summer in the 1930's (labelled) is only a matter of around 2-3 degrees Fahrenheit.

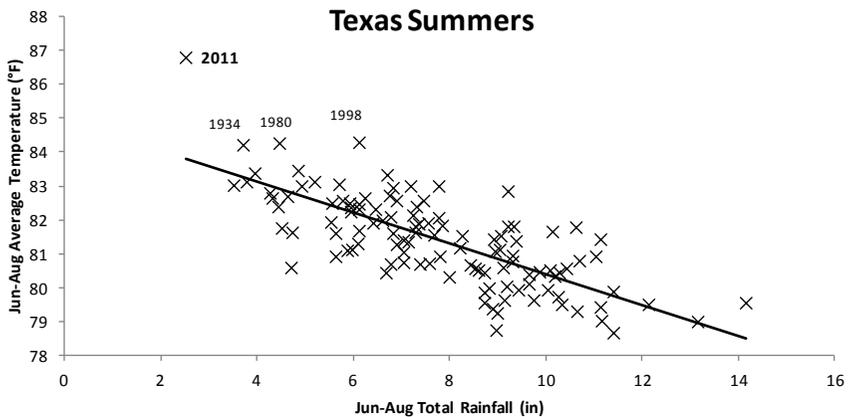


Figure 1.10-15: Plot of Texas Summer rainfall and temperature 1895 to present; adapted by author from [34]

In a world gripped by climate change, it is quite probable that summer droughts similar to that which has recently occurred in Texas, will become more commonplace. These circumstances lead to an increased chance of forest fires and potentially billions of dollars worth of further economic hardship from reduced yields and productivity^[35].

Warming is however just one of the direct affects of higher CO₂ levels. Carbon emissions in the atmosphere also have secondary effects alongside warming. Ocean acidification is global warming's less reported but equally severe sister phenomenon, and based on historical data, seems to be driven by exactly the

same mechanism. The acidification of oceans arises from the ocean's natural tendency to absorb carbon dioxide, becoming more effective when warmer. This natural reaction leads to a drop in pH of the water (an increase in acidity). The current combination of a carbon rich atmosphere and a warming globe promotes ocean absorption.

Figure 1.10-16 shows the gradual acidification (fall in pH) over the past 20 or so years. The trend seems fairly benign, but offers little insight, as no knowledge is gleaned as to the longer term pH dynamics of oceans.

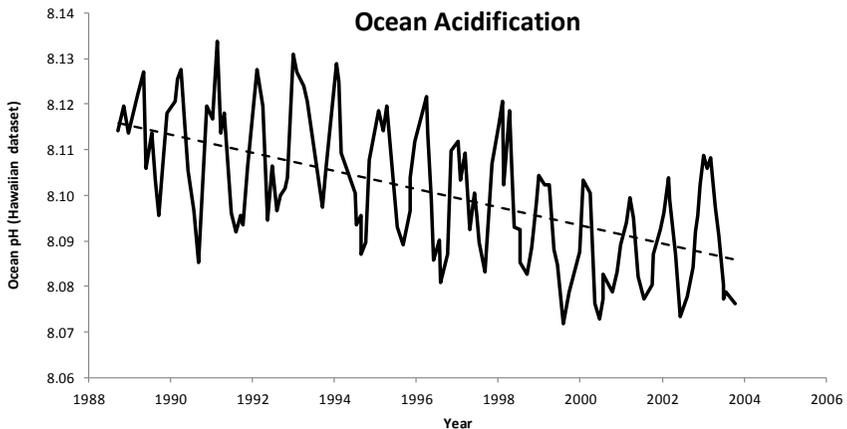


Figure 1.10-16: Plot of sample ocean pH levels from Hawaiian ocean. Adapted by author from [36]

Figure 1.10-17 shows this decline in a more relevant light, modelling pH based on temperature and known carbon dioxide concentrations over the past 25 million years. The results are shocking, showing how the modern change in ocean pH is unprecedented in rapidity. Not only this, but our warmer and more carbon rich atmosphere has produced an ocean acidity which is more severe than at any point over the past 25 million years.

The effect of this acidification is complex and generally uncertain at this point in time. The rapid change in pH is however a cause for concern for calcifying organisms. The calcification process is used by a wide range of ocean organisms, such as corals in order to synthesise shells. This process is hindered by the increasingly acidic and carbon rich waters, and will potentially lead to a significant reduction in coral reef populations should the trend continue.

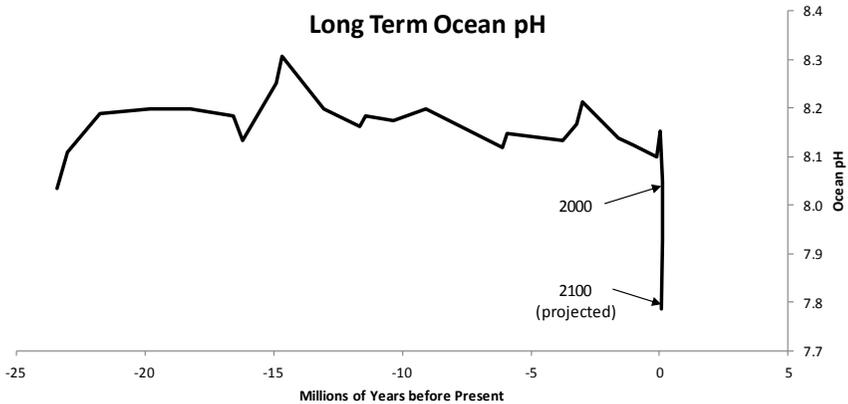


Figure 1.10-17: Long term ocean pH dynamics. Adapted by author from [37]

This effect in itself is not a disastrous scenario, but is exacerbated by the reliance of tropical coastal fisheries upon coral dominated, reef dwelling fish stocks. A large reduction in reef systems in the tropics may potentially lead to large-scale changes in the critical habitats of many fish species. These species, many of which are completely dependent on coral systems for food and shelter, would be expected to dwindle in tandem with falling coral populations^[38].

Additionally, direct effects upon some fish species include hypercapnia, in which the blood is saturated with carbon dioxide. This may potentially lead to increased mortality within fish stocks and has been observed in some species of fish in water of elevated CO₂ levels^[39].

Aside from the effects mentioned, how ocean acidification will manifest remains largely open to debate. This however does not mean that it is to be taken lightly, as with significant human populations dependent upon the sea for nutrition every day, and a growing world population set to further strain these fish stocks, the future of our marine biology is of the utmost importance. The rate of change in ocean pH alone seems to suggest that this trend is of our doing and is worthy of our concern.

Denial

While the mechanics of climate are not easy to follow, a cursory glance by even the most sceptical individual must suggest that something is changing, and that this change seems to hinge upon a period around our industrial revolution. Despite this conservative assessment of the data, a fierce movement has erupted

against the politicised science of climate, and it is one which is in good political stead.

This growing denial movement cannot be written off as ideologues in its entirety, as many act upon scientific and rational qualms with climate research. However, more often than not, opponents to climate legislation may be traced back to well funded ideological think tanks or businesses with strong vested interests against such legislation.

A 2010 article in the British newspaper, The Independent, suggested that: “...a complicated web of relationships revolves around a number of right-wing think-tanks around the world that dispute the threats of climate change.”^[40]

Amongst these, The Atlas Foundation, The Heartland Institute and the International Policy Network have been known to receive hundreds of thousands of dollars in support from oil giant, ExxonMobil in recent years, based upon information gleaned from the company’s reports. The Atlas Foundation has also offered financial support to over 30 other similarly inclined think tanks with anti-climate messages, and along with the Heartland Institute has been very active in organising large conferences to push this agenda, such as a New York event entitled “*Global Warming: Was It Ever Really a Crisis?*”^[41]

The Koch Brothers, influential figures in the oil industry, made their mark on the debate by funding an independent enquiry into climate, led by physicist and vocal climate sceptic Dr Richard Muller. Almost humorously, the big oil funded, climate sceptic fronted project witnessed Dr Muller admirably swallow his pride and stick to the science. In a submission to the U.S. House of Representatives, Muller praised the work of climate scientists as “excellent” and suggested the creation of a new agency to study climate change^[42].

Elsewhere, smooth talking journalists or politicians stand steadfast in their misrepresentation of the truth and insist on discrediting the consensus of climate change through cherry picking or lies of omission. Such commentators, such as James Delingpole or Christopher Monckton beguile their audiences with sweet sounding half truths such as “Antarctic sea ice has been increasing”*, or total fallacies, such as “there has been no warming since 1998.”^[43]

To the public, uneducated in climate science, tales of governmental and scientific conspiracy are easy and enjoyable to digest. It is convenient and

* *As we have already discussed, Antarctic increases in sea ice are due to complex ocean dynamics, and are not indicative of global warming's falsity - see [27].*

comforting to see 1998 as the warmest year on record, and any further climate legislation as the work of money hungry politicians. An insidious government does not require a total rethink of our consumer society, or a reflection upon our ecological ineptitude. It does not question our model of value, or the future of an ever growing market system in a changing world. It is a simple 'us and them' worldview, and requires no difficult introspection at a personal or social level.

From an alternative perspective, this tact is of particular interest, as it also demonstrates the payoff of the market incentive when faced with a cost incurrence which is not individualist, immediate or short term. Under a market system, the cost to redesign our oil hungry civilisation to one which emits carbon in ecologically tolerable amounts is astronomical. Despite this, any attempt to pay for these costs is met with hostility, due to the invisibility of the problem in the short term. Long term collective value, which underpins a future world not gripped by anthropogenic pollutants, is simply not the driving force of the market mechanism, and until a 'price shock' due to shortage or climate instability manifests, the market seems relatively unresponsive to the changing game.

The ideal of economic growth also comes under scrutiny when perusing denial and inaction at a global level. Balancing exponential productivity growth with decreasing carbon emissions is a task which seems very difficult, as the only recent dent in our ascendant emission profile occurred during the 2008 financial crisis; a significant period of de-growth.

As such, governments remain reluctant to commit fully to the costs of climate destabilisation, due to concerns for their own growth prospects. Again, from an evolutionary perspective this banally represents the pursuit of individual, short term value, at the expense of possible greater long term hardship for all involved - a collective irrationality.

It must however also be said that those on the side of the scientific consensus are not without fault in this argument. The recent viral video by environmental activist group 10:10, which depicts climate deniers being 'blown up' for not wishing to take part in emission reduction is crude, and is sadly indicative of the prevailing opinion of this camp's adversaries^[44].

If any progress is to be made in this difficult field, it must be understood that the individuals opposed are not solely to blame, nor are the powerful institutions which ensnare such individuals. The primary progenitor of such opposition is the system of values which demands that global warming *must not* be true, and

thus forces the hand of such denial proponents to either reject the truth or reject their entire value system. Rejection of an inconvenient truth in this case is the much easier path.

Any attempt to combat the effects of climate change cannot be drilled into the minds of those opposed simply by the fact of its existence alone, as seems to be the current main line of approach. Without reform of our economic system and its foundational principles of growth and consumption, any headway along this path is likely to be underwhelming and fraught with difficulty. It is not enough to simply tell people that they are wrong; instead we must come to understand that our pseudo-evolutionary social model is what is driving us toward this precipice.

A concerted effort to battle climate change does not necessarily mean higher taxes, nor does it necessarily override our liberties and freedoms. Such things only arise when trying to hammer the square peg of limitless growth into the round hole of sustainability, and attempting to model collective long term value within a short term and individualist system of commerce. Conversely, it seems that the benefits and security of a clean and renewable energy supply, as well as a world which is not gripped by addictive and damaging consumerism, may actually point toward a future more prosperous than the present.

Biofuels- Future or Folly?

A future increasingly powered by biofuels is one which is often on the lips of policymakers and industrial officials alike. The recent technological breakthrough in biofuels represents the current guise of the smooth talking cargoist. This line of apologetics asserts that technology will allow humanity to outrun ecological concepts without any systemic change or rethought.

Such a line of action however remains steadfastly ignorant of the concepts of ecology which underpin our energy and resource hunger. While there are certainly benefits to plant based biofuels and their usage as a replacement for fossil fuel derivatives, there are also significant issues which must be addressed.

It is first important to stress that, in essence, the only difference between biofuels and fossil fuels is temporal. The fossil fuel energy which we release today was sequestered by organisms long ago, using broadly similar approaches. The sole difference is that biofuel aims to release energy which has been sequestered very recently, by organisms which also lived very recently. As such, biofuel is essentially fossil fuel in real-time, absent of drawdown and absent of millions of years of natural stockpiling.

The benefit of the here-and-now is that we do not have to wait for natural processes to form fuel by hook or crook, we can select our organism based upon the quality of the fuel which we can synthesise from it. There are a whole host of crops from which we can derive fuel, from wood to jatropha, straw to algae, etc. A selection of these sources are shown in Figure 1.10-18, along with their range of CO₂ emission profiles.

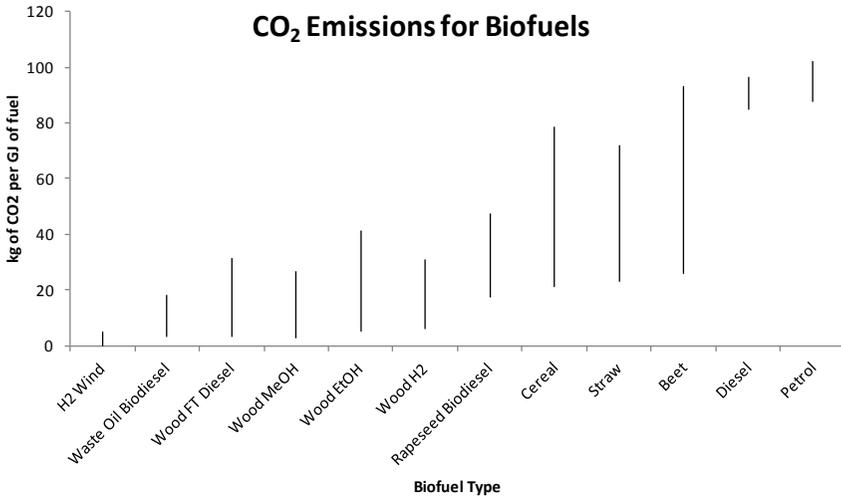


Figure 1.10-18: Various biofuels in relation to their carbon emission profiles - Adapted by author from [45]

What is immediately interesting is that there is quite a spread in the potential of each of these fuels, and most offer benefits over dominant petrol and diesel fuels in terms of their level of pollutants. This is however not representative of the entire story, as in order to reap these rewards, the biofuels are subject to the disadvantageous requirement that they must be grown here and now. This requires land.

It is currently not possible to summarise the global potential of biofuels accurately, due to the variety of crop management procedures from region to region. Research has suggested that possible yields lie around 30 gigajoules per hectare per year (GJ/ha/yr)^[46].

This figure of course has the potential to be higher in the future. Taking 50 GJ/ha/yr as a very rough average, in order to provide 10% of the global transportation fuel demand (approximately 170 exajoules per year^[47]) we would require approximately 7% of land under crops and pasture (around 5 billion

hectares). Needless to say, this is a gigantic amount of land to dedicate to biofuel production.

It is however an interesting fact that degraded agricultural lands, woodlands and watersheds are believed to amount to nearly 2,000 Mha globally^[48]. If this assessment proves to be accurate, and there is an opportunity to produce biofuels in ways that would help to restore degraded lands and watersheds, then this is positive news.

From this very simple estimate, the vast tracts of land needed to generate the energy which we consume via the drawdown of fossil fuels becomes dauntingly apparent. A further calculation posited that it was impossible to cover even half of our current energy demand (conservatively assuming 29.2% of the Earth is land, of which 13% is arable, energy conversion efficiencies of 1% from sunlight to biomass, and 20% yield as oil) using conventional biofuel technologies^[49]. The concept of ghost acreage becomes all too clear when we peruse how much land we need now to recreate our ancient stockpile of drawdown energy.

A further effect of this land requirement is that important carbon sequestering rainforest regions in Brazil and South East Asia are currently being cleared at an unprecedented rate to make room for soybean and oil palm plantations for the production of biodiesel. This is simply unsustainable and only offsets one problem by exacerbating another.

The usage of this additional land is however not the sole concern. To improve yields, arable crops are generally fertilised at rates of up to 350kg/ha/yr of nitrogen^[50]. If new land is brought into cultivation for biofuels, as seems necessary to meet policy requirements, fertilisation will be required, which in turn will lead to an increase in emissions of N₂O.

Crutzen et al (2007) presented research which considers N₂O release from rivers, estuaries and coastal zones, animal husbandry and the atmospheric deposition of ammonia and NO_x. This study suggested that the amount of nitrogen returned to the atmosphere through mineralisation as N₂O is in the range of 3–5%. N₂O emissions could therefore significantly reduce the currently assumed emission benefits from replacing conventional fossil fuels with biofuels^[51].

Cultures of microalgae for biodiesel production are however a promising possibility, and offer many benefits due to the lack of competition with food production^[52]. These cultures may make use of stagnant bodies, wastewater or

even artificial bioreactors on non-arable land for algae fuel production. Figure 1.10-19 shows the benefits of biofuels based upon algae cultures in terms of global land mass.

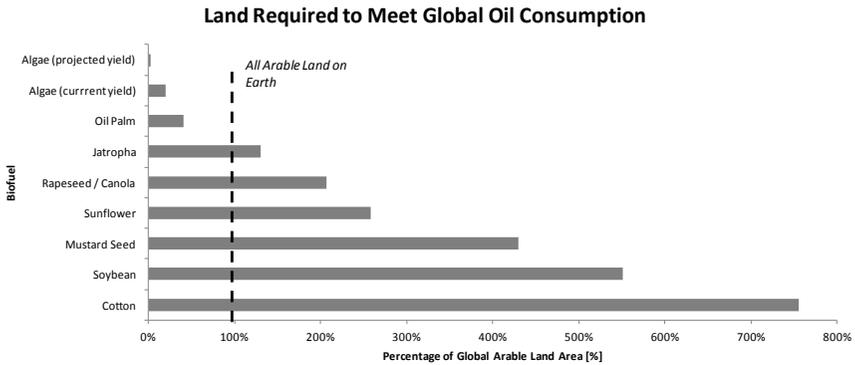


Figure 1.10-19: Plot of land required for various biofuels to meet global oil energy requirements - Note that all fuels, with the exception of algae and palm oil, require significantly more land than all the arable land on the planet in order to meet our drawdown needs - Adapted by author from [53]

Additional benefits of algae include high oil content in comparison to other crops, fast growth rates allowing more rapid turnover of fuel production, and potential for carbon neutrality. However, despite the potential positives, it is clear that biofuels alone are not a silver bullet which can save our economy from any form of systemic change. When offset against the backdrop of increasing food insecurity, climate change, and the lack of maturity of technologies available, it is clear that biofuels can only be part of a larger portfolio of strategies to make our civilisation ecologically coherent.

Cargoism can only go so far, and depending upon biofuel to save the day, while pushing forth with a socio-economic model which is deeply inefficient and unsound cannot be viewed as a cogent strategy from any standpoint.

To Act or not to Act

Given what we know and what we do not know about climate change, do we commit to action or do we resign to business as usual? Again, I do not suggest that you adopt my opinion towards this difficult debate, but in light of the potential risks and uncertainties, and given the evidence in favour of anthropogenic warming, I feel it would be foolhardy not to act. While the risks and their timescales are poorly understood at this moment in time, the stakes are unimaginably high should we choose to throw caution to the wind.

Indeed, it seems that given the known effects of CO₂ and other greenhouse gases, that even if the source of the current warming was not anthropogenic at all, continuing to accelerate greenhouse gas emissions would only exacerbate the problem and potentially increase its severity.

In addition, the future of our civilisation's access to drawn down fossil fuel energy is precarious, and continuing to exploit progressively lower quality oil reserves will yield nothing but diminishing returns. This factor is intrinsically linked with climate change, and forces us to look hard at our ecological footprint. It is not an argument anymore to use scepticism of climate change in order to champion a return to business as usual. We have been dealt the cards, and squabbling over what they mean is nothing more than a temporary diversion.

From an ecological standpoint, our exuberant growth and its subsequent negative effects upon the environment is academic. The path to resolving these issues is not an easy one, and certainly cannot be attained by fine tuning our pseudo-evolutionary social system. We stand at the apex of beneficial evolutionary individualism for our species, and attempting to reduce emissions, while preserving wasteful competitive markets based upon exuberant growth is not an effective path to take.

Returning to our peers in the winery vat, a suggestion that the way forward for the exuberant yeast would be to become more scrupulous and reduce their uptake of drawdown sugar would be met with scorn. For each individual cell, continuing to strive for exuberant growth is the only viable route, and without a social contract of some form, no single cell would agree to such a proposition.

Yet this is the path that our pseudo-evolutionary market presents to us. Individuals are prompted to live their lives in line with the exuberant precedents, while also somehow expected to wean off the abundant fossil fuel energy which fostered it. The holes in this path forward are painfully obvious when perused ecologically, and perhaps more maddeningly, like our theoretically scrupulous yeast brethren, the diminishing returns of growth* are already manifesting themselves within our cultural constructs.

* *The diminishing returns of growth in per capita income are already observable - more of this will be discussed in chapter 1.13*

Drowning in Waste

It would be an incomplete assessment to merely review climate change as the sole incarnation of humankind's ecological impact upon the world. Our industrial system is primarily fuelled by burning fossil fuel, and so carbon emissions and other greenhouse gases are an understandable upshot of this. While the yeast in the winery vat produce their poisonous alcohol when fed with a surplus of sugar, humans are more varied in their vices.

As we have perused as far back as chapters 1.2 and 1.3, the system of cyclical consumption which drives the market system requires an unimaginable turnover of material production. The production of materials into refined forms which are not naturally occurring provides some significant issues that are ecologically analogous to our yeast parable.

A gigantic proportion of the non-recyclable, toxic or dangerous waste that arises from our industrial consumer society ends its useful existence in the oceans, most notably in what has come to be known as the Great Pacific Garbage Patch. The name of this 'patch' is perhaps slightly misleading, as the area is primarily a concentration of semi-degraded plastics, chemical sludge and other small fragments of debris, that are not immediately noticeable by the naked eye. None the less, the swirling currents of the pacific gyre mean that human waste which finds itself in the ocean is likely to find itself pooled within this area, rather than dispersed.

The result is an incredibly large region of water in which high concentrations of plastic detritus is present. Due to the inherent difficulty in measuring these concentrations accurately, estimates of size have ranged from 700,000 square kilometres (about the size of Texas) to more than 15,000,000 square kilometres^[54].

The presence of these plastics in the marine ecosystem presents some serious problems for various species dependent upon the Pacific in the area surrounding the gyre. The longer lasting plastics in the patch typically end up being ingested by fish, birds and other animals, either being mistaken for food, or accidentally consumed alongside food.

The picturesque Midway Islands, which lie in close proximity to the patch, suffer an average of twenty tonnes of plastic washing up on their shores every year, around 5 tonnes of which ends up in the stomachs of the indigenous Laysan Albatross. Of the 1.5 million albatrosses that inhabit Midway, nearly all

are found to have plastic in their digestive system.* Approximately one-third of their chicks die due to choking, plastic toxicity, or other factors related to their ingestion of garbage^[55].

This is obviously an abhorrent phenomenon that is tremendously wasteful and damaging to the conservation of endangered species, but in the scope of human ecology, how do the deaths of indigenous birds and fish in the middle of the Pacific Ocean affect human civilisation?

In addition to the particles' danger to wildlife local to the patch, on the microscopic level, the floating debris can absorb organic pollutants from the seawater, which result in toxic effects and hormone disruption when ingested. Many of these fish which ingest the toxic chemicals are near the bottom of the food chain, and are preyed upon by larger fish.

The result is a bioaccumulation, whereby, in each step up the food chain, the toxicity is magnified for the larger animals nearer the top. When these fish are eventually consumed by humans, the resulting ingestion of toxic chemicals is more severe. This effect is very difficult to measure, due to the complex factors involved, but the basic heuristics of the process are well known^[57].

The result of this is a scenario which is fully in keeping with our parable of the yeast in the winery vat. As humankind produces waste, this waste accumulates and undermines the population. In this case, the waste is toxic plastic detritus, and the vehicle by which it undermines us is by progressively poisoning our food stocks.

However, there remain myriad other manners in which the same dynamic manifests itself within human civilisation. As we have discussed through the incorrect, but illustrative Gaia hypothesis, humankind is dependent upon a vast web of other species, whose services go far beyond the simple provision of food in our seas.

6th Mass Extinction

Some 66 million years ago, when the Chicxulub asteroid impacted what is now the Yucatan peninsula of Mexico, life on Earth was subject to a catastrophic extinction event. This event has since wandered into our pop-culture as 'the asteroid that killed the dinosaurs'. The 6 mile across asteroid impact released

* *Photographer Chris Jordan presented his stark images of dead albatross chicks on Midway Atoll, their stomachs filled with plastic buttons, toys, cigarette lighters and other detritus - see [56]*

upward of a billion times the energy of the nuclear bombing of Hiroshima, wiping out nearly 3/4 of plant and animal life-forms - an obvious result of such a brutal collision.

However, a less salient fact for the human mind to digest is the fact that we are currently living through an extinction event of similar scale. In a 1995 study published by the journal, *Science* and entitled *The Future of Biodiversity*, the present rate of extinction may be up to 140,000 species per year^[58].

Harvard biologist E. O. Wilson is more conservative in his estimates, but still argues that up to 30,000 species per year (or three species per hour) may be disappearing in the wild^[59]. The current rate of extinction has been estimated to be between 100 and 1,000 times higher than the historically typical rate of extinction under normal conditions.

So what is the cause of this explosion in the extinction rate? Unsurprisingly, almost all evidence points to our ever increasing population. Figure 1.10-20 shows the correlation between the rising human population and the rising amount of extinctions.

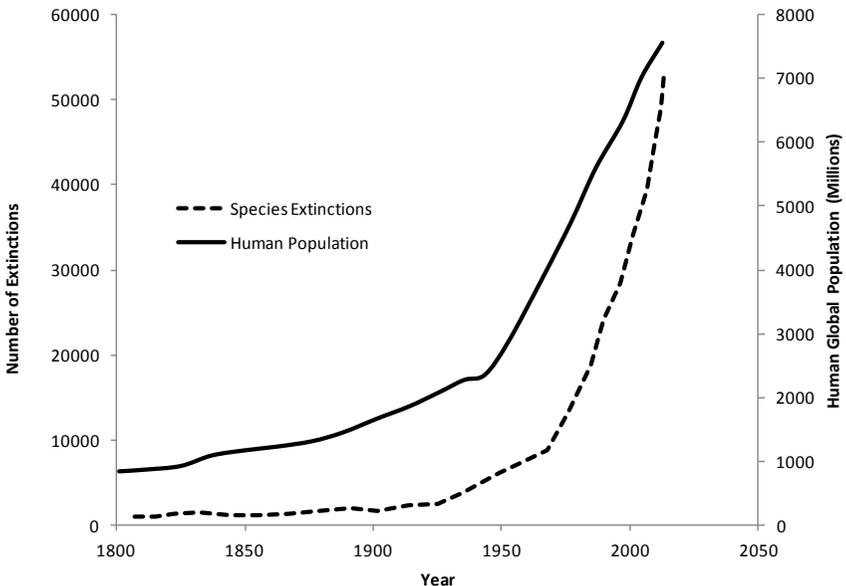


Figure 1.10-20: Graph of human population and species extinctions - Adapted by author from [60]

But substantially more evidence exists than just simple correlations. In a study entitled *Human Domination of Earth's Ecosystems*, the staggering scale of human enterprise on earth is described. Humans annually absorb 42 percent of the Earth's terrestrial net primary productivity, 30 percent of its marine net primary productivity, and 50 percent of its fresh water; Forty percent of the planet's land is devoted to human food production, up from 7 percent in 1700; Fifty percent of the planet's land mass has also been transformed for human use^[61].

These shocking numbers led the authors of *Human Domination of Earth's Ecosystems*, including the current director of the National Oceanic and Atmospheric Administration (NOAA), to conclude:

"[A]ll of these seemingly disparate phenomena trace to a single cause: the growing scale of the human enterprise. The rates, scales, kinds, and combinations of changes occurring now are fundamentally different from those at any other time in history. . . . We live on a human-dominated planet and the momentum of human population growth, together with the imperative for further economic development in most of the world, ensures that our dominance will increase."^[62]

So with humans as a likely cause of this mass extinction, and the mass extinction likely to continue so long as consumption, population and human development continues, what ramifications can we expect? Is it simply do eyed conservationism to bemoan the disappearance of the dodo, the quagga or the panda? How does this affect us?

There is of course sentimentality towards our fellow life-forms on earth, but the primary cause for concern here is the services which nature provides humanity to bolster carrying capacity.* Environmentalist think tank, The Economics of Ecosystems and Biodiversity (TEEB) petitions for these services that nature provide for free to be understood and accounted for within legislation and regulatory frameworks. Some powerful examples it gives are listed below:

Conserving forests avoids greenhouse gas emissions worth \$3.7 trillion

Halving deforestation rates by 2030 would reduce global greenhouse gas emissions by 1.5 to 2.7 GT CO₂ per year, thereby avoiding damages

* We will discuss the value that nature offers humankind in chapter 1.12, and how this is not accurately modelled through simple market prices.

from climate change estimated at more than \$3.7 trillion in NPV terms. This figure does not include the many co-benefits of forest ecosystems.

The importance of coral reef ecosystem services

Although just covering 1.2% of the world's continental shelves, coral reefs are home to an estimated 1-3million species, including more than a quarter of all marine fish species. Some 30 million people in coastal and island communities are totally reliant upon reefbased resources as their primary means of food production, income and livelihood,

Bee keeping generates \$213 million annually in Switzerland

A single bee colony ensured a yearly agricultural production worth \$1050 in pollinated fruits and berries in the year 2002, compared to just \$215 for direct products from beekeeping (e.g. honey, beeswax, pollen). On average, Swiss bee colonies ensured a yearly agricultural production worth about \$213 million by providing pollination, about 5 times the value of the production of honey. The total economic value of insect pollination worldwide is estimated at 153 billion euro, representing 9.5% of world agricultural output in 2005.

Tree Planting enhances urban quality of life in Canberra, Australia

Local authorities in Canberra have planted 400,000 trees to regulate microclimate, reduce pollution and thereby improve urban air quality, reduce energy costs for air conditioning as well as store and sequester carbon. These benefits are expected to amount to some \$20-67 million over the period 2008 to 2012, in terms of the value generated or savings realised for the city.^[63]

The lucrative examples listed above however are among some of the most threatened forms of natural services by human activity. Deforestation continues to accelerate in order to provide more space for large scale food production; coral reefs remain under serious threat due to the trends of ocean acidification and other forms of human pollution. Pollination by bees is perhaps the most worrisome of these issues, as the lax use of pesticides to reduce short term waste has contributed to the collapse of many European honey bee colonies, in a phenomenon which continues to progress.

By continuing to place strain on the environment, through pseudo-evolutionary, self directed incentive systems, abstract economic growth, accelerating

consumption and needlessly exuberant population expansion, humankind continues to encroach further upon these valuable life support systems.

This trajectory is intrinsically self defeating, and ultimately erodes carrying capacity by undermining the processes which support us. In the same regard as climate change, and the pollution of the food chain, the mass extinction of biodiversity is just another facet in our yeast-like exuberance in the winery vat.

Conclusions

The ecological reality of human civilisation presents some difficult truths for the market system from a theoretical basis, as we have seen in the previous chapter. What this chapter has demonstrated is that the real world implications of human ecology are undoubtedly occurring with some severity.

The reality of climate change, poisoning of the food chain, and erosion of life supporting biotic ecosystems stand as warnings against the pervasive attitude that humans can expand unconstrained, and can use their intuitiveness to incrementally solve issues as they arise.

In actuality, these phenomena arise from the fundamental pseudo-evolutionary nature of the market system, and the short-sighted individualist incentives that it inculcates. As we have demonstrated in previous chapters, the rising human population on earth is primarily driven by nations who are economically disadvantaged in the global spectrum of inequality.

The market system demands inequality in order to function, as libertarian philosophers such as Rothbard will nonchalantly insist. There is therefore much to be said relating to the market's role in exacerbating birth rates in developing nations, and thus creating circumstances under which our population continues to bloat.

Furthermore, the developed world does not escape unscathed from this criticism, as the bloated consumption patterns of the West, littered with needless excess, constancy and waste, is also accountable for the mountains of detritus in our oceans, and the vast swathes of land being cleared to raise livestock. These high levels of consumption, as we have seen in chapter 1.2, are almost exclusively artificialities engendered by the market's requirement for constant, cyclical flows of goods and labour.

The marketplace must therefore take the brunt of criticism for these trends, as the incentives which it perpetuates are as ecologically basal as the outcomes which we are observing. It is only with an understanding of nature, and a system

of economics which takes nature's indifference toward humanity in its stead, can a truly prosperous human civilisation emerge.

Chapter 1.10 - References and Notes

- [1]. Svante Arrhenius, *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground*, Philosophical Magazine and Journal of Science Series 5, Volume 41, April 1896, pages 237-276.
- [2]. Svante Arrhenius, *Worlds in the making: the evolution of the universe*, Harper, 1908, pp54-61
- [3]. J. T. Kiehl and Kevin E. Trenberth, *Earth's Annual Global Mean Energy Budget*, Bulletin of the American Meteorological Society, Vol. 78, No. 2, pp197-208, February 1997
- [4]. Plot created using the NIST Chemistry WebBook - <http://webbook.nist.gov/>
- [5]. *Move to cut methane emissions by changing cows' diet*. The Guardian, 10 July 2007 - <http://www.guardian.co.uk/science/2007/jul/10/ruralaffairs.climatechange>.
- [6]. G. R. van der Werf, *CO₂ emissions from forest loss*, Nature Geoscience 2, 2009, pp737 - 738
- [7]. Forster, P., V. Ramaswamy, P. Artaxo, T. Bernsten, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: *Changes in Atmospheric Constituents and in Radiative Forcing*. In: *Climate Change 2007: The Physical Science Basis*. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA
- [8]. GISTEMP Team, 2015: GISS Surface Temperature Analysis (GISTEMP). NASA Goddard Institute for Space Studies. - <http://data.giss.nasa.gov/gistemp/>
- [9]. Gerald A. Meehl et al, *Combinations of Natural and Anthropogenic Forcings in Twentieth-Century Climate*, Natural and Anthropogenic Forcings in Twentieth-Century Climate. J. Climate, 17, pp3721–3727
- [10]. David W. J. Thompson et al, *A Large Discontinuity In The Mid-Twentieth Century In Observed Global-Mean Surface Temperature*, Nature 453, 646-649 (29 May 2008)

- [11]. Data taken from National Oceanic and Atmospheric Administration, National Centers for Environmental Information - <http://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/climate-reconstruction>
- [12]. Michael E. Mann, *Global Signatures and Dynamical Origins of the Little Ice Age and Medieval Climate Anomaly*, Science, 27 November 2009: Vol. 326 no. 5957 pp. 1256-1260
- [13]. Data taken from National Oceanic and Atmospheric Administration, National Centers for Environmental Information - <http://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/climate-reconstruction>
- [14]. D. O. Gough, *Solar interior structure and luminosity variations*, ESA and European Physical Society, ESLAB Symposium on Physics of Solar Variations, 14th, Scheveningen, Netherlands, Sept. 16-19, 1980. Solar Physics, vol. 74, Nov. 1981, pp. 21-34.
- [15]. A. L. Berger, *Obliquity and Precession for the last 5000000 years*, Astronomy and Astrophysics 51, 1967, pp127-135
- [16]. Data taken from National Oceanic and Atmospheric Administration, National Centers for Environmental Information - <http://www.ncdc.noaa.gov/data-access/paleoclimatology-data/datasets/climate-reconstruction>
- [17]. Temperature taken from: GISTEMP Team, 2015: GISS Surface Temperature Analysis (GISTEMP). NASA Goddard Institute for Space Studies. - <http://data.giss.nasa.gov/gistemp/>. Total solar irradiance (1880 to 1978) taken from: N. A. Krivova, L. Balmececa, S. K. Solanki, *Reconstruction of solar total irradiance since 1700 from the surface magnetic flux*, Astronomy & Astrophysics, 467, 335–346 (2007). Total Solar Irradiance (1979 to 2009) from Skeptical Science - <http://www.skepticalscience.com/solar-activity-Sunspots-global-warming.htm#temperature>
- [18]. Dana L. Royer, *CO₂-forced climate thresholds during the Phanerozoic*, Geochimica et Cosmochimica Acta, Volume 70, Issue 23, 1 December 2006, pp5665–5675
- [19]. *Ibid*
- [20]. Adam Z. Csank et al., *Estimates of Arctic land surface temperatures during the early Pliocene from two novel proxies*, Earth and Planetary Science Letters, Volume 304, Issues 3–4, 15 April 2011, pp291–299

- [21]. Gary S. Dwyer, Mark A. Chandler, *Mid-Pliocene sea level and continental ice volume based on coupled benthic Mg/Ca palaeotemperatures and oxygen isotopes*, Phil. Trans. R. Soc. A (2009) Vol 367, pp157–168
- [22]. Andrew C. Kemp et al, *Climate related sea-level variations*, PNAS, 2011.
- [23]. Martin Vermeer, Stefan Rahmstorf, *Global sea level linked to global temperature*, PNAS, 2009
- [24]. Michael E. Mann et al, *Proxy-based reconstructions of hemispheric and global surface temperature variations over the past two millennia*, Proc. Natl. Acad. Sci., 105, pp13252-13257, 2008
- [25]. Stefan Rahmstorf, *A Semi-Empirical Approach to Projecting Future Sea-Level Rise*, Science 19 January 2007: Vol. 315 no. 5810 pp. 368-370
- [26]. W. T. Pfeffer, J. T. Harper, S. O'Neel, *Kinematic Constraints on Glacier Contributions to 21st-Century Sea-Level Rise*, Science 5 September 2008: Vol. 321 no. 5894 pp. 1340-1343
- [27]. Jinlun Zhang, *Increasing Antarctic Sea Ice under Warming Atmospheric and Oceanic Conditions*. American Meteorological Society, 2007.
- [28]. Data taken from National Snow and Ice Data Center (NSIDC) - nsidc.org/data/
- [29]. J. Stroeve et al, *Arctic sea ice decline: Faster than forecast*. American Geophysics Union, 2007.
- [30]. I. Allison, et al. *The Copenhagen Diagnosis, 2009: Updating the World on the Latest Climate Science*. The University of New South Wales Climate Change Research Centre (CCRC), Sydney, Australia, pg 30
- [31]. Robert J. Nicholls, *Coastal flooding and wetland loss in the 21st century: changes under the SRES climate and socioeconomic scenarios*. Global Environmental Change, 2004.
- [32]. G. McGranahan, *The rising tide: assessing the risks of climate change and human settlements in low elevation coastal zones*. Environment & Urbanization, 2007.
- [33]. Hillary Hylton, *Forget Irene: The Drought in Texas Is the Catastrophe That Could Really Hurt*. Time, 31 Aug 2011 - <http://www.time.com/time/nation/article/0,8599,2091192-2,00.html>.

- [34]. John Nielsen-Gammon, *Texas Drought: Spot the Outlier*. Climate Abyss, 29 Aug 2011 - <http://blog.chron.com/climateabyss/2011/08/texas-drought-spot-the-outlier/>.
- [35]. Kate Galbraith, Kate. *Catastrophic Drought in Texas Causes Global Economic Ripples*. New York Times - 30 Oct 2011. https://www.nytimes.com/2011/10/31/business/energy-environment/catastrophic-drought-in-texas-causes-global-economic-ripples.html?_r=1.
- [36]. John Volkman, *Report of the Ocean Acidification and Oxygen Working Group*, SCOR Biological Observatories Workshop, 2009.
- [37]. C. Turley et al, *Reviewing the Impact of Increased Atmospheric CO₂ on Oceanic pH and the Marine Ecosystem in Avoiding Dangerous Climate Change*, Cambridge University Press, 2007.
- [38]. *Ibid*, pp67-68
- [39]. *Ibid*, pg68
- [40]. Jonathan Owen, Paul Bignell, *Think-tanks take oil money and use it to fund climate deniers*, The Independent, Sunday 07 February 2010 - <http://www.independent.co.uk/environment/climate-change/thinktanks-take-oil-money-and-use-it-to-fund-climate-deniers-1891747.html>
- [41]. *Ibid*
- [42]. Richard Muller, tatement to the Committee on Science, Space and Technology of The United States House of Representatives, 2001.
- [43]. Fiona Harvey, *Ukip's Lord Monckton thrown out of Doha climate talks*, The Guardian, Friday 7 December 2012 - <http://www.theguardian.com/environment/2012/dec/07/doha-climate-talks-ukip-lord-monckton>
- [44]. Damian Carrington. *There will be blood – watch exclusive of 10:10 campaign's 'No Pressure' film*. The Guardian. 30 September 2010
- [45]. *Sustainable biofuels: prospects and challenges*, The Royal Society, January 2008, pg 56
- [46]. R. E. H. Sims, A. Hastings, B. Schlamadinger, G. Taylor, P. Smith, *Energy crops: Current status and future prospects*, Global Change Biol. 12, 2006, pp2054–2076
- [47]. *Sustainable biofuels: prospects and challenges*, The Royal Society, January 2008, pp 51-52

- [48]. UNEP, *Global environment outlook 3 – past, present and future perspectives*. United Nations Environment Programme, Earthscan Publications Ltd: London, 2002
- [49]. P.M. Schenk et al, *Second Generation Biofuels: High-Efficiency Microalgae for biodiesel Production*. Bioenergy Research, 1, 2008, pp20-43
- [50]. *Sustainable biofuels: prospects and challenges*, The Royal Society, January 2008, pg 40
- [51]. P. J. Crutzen et al, *N₂O release from agro-biofuel production negates global warming reduction by replacing fossil fuels*, Atmos. Chem. Phys., 8, 389– 395 , 2008
- [52]. J. Sheenan et al, *A look back at the U.S. Department of Energy's aquatic species program – biodiesel from algae*. National Renewable Energy Laboratory, USA, 1998.
- [53]. P.M. Schenk et al, *Second Generation Biofuels: High-Efficiency Microalgae for biodiesel Production*. Bioenergy Research, 1, 2008, pp 20-43 (Table 1)
- [54]. P. G. Ryan et al, *Monitoring the abundance of plastic debris in the marine environment*. Philosophical Transactions of the Royal Society B: Biological Sciences 364 (1526): pp1999–2012, 2009
- [55]. Shinsuke Tanabe et al, *PCDDs, PCDFs, and Coplanar PCBs in Albatross from the North Pacific and Southern Oceans: Levels, Patterns, and Toxicological Implications*, Environ. Sci. Technol., 2004, 38 (2), pp 403–413
- [56]. Photographs available at - www.chrisjordan.com/gallery/midway/
- [57]. Rolf U. Halden, *Plastics and Health Risks*, Annual Review of Public Health, Vol. 31: 179-194 (April 2010)
- [58]. S. L. Pimm, G. J. Russell, J.L. Gittleman and T.M. Brooks, *The Future of Biodiversity*, Science 269: 347–350 (1995)
- [59]. Jeffrey E. Foss, *Beyond Environmentalism: A Philosophy of Nature*, Wiley, 2009, pg35
- [60]. J. Michael Scott, *Threats to Biological Diversity: Global , Continental, Local*, University of Colorado Law School, Colorado Law Scholarly Commons Shifting Baselines and New Meridians: Water, Resources, Landscapes and the Transformation of the American West (Summer Conference, June 4-6), 2008
- [61]. P. M. Vitousek, H. A. Mooney, J. Lubchenco, and J. M. Melillo. 1997. *Human Domination of Earth's Ecosystems*. Science 277 (5325): 494–499.
- [62]. *Ibid*, pg 498

- [63]. TEEB, *The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB*, 2010, pg8

1.11 Overshoot II - Depletion

AS WE HAVE DISCUSSED in chapter 1.9, Liebig's Law of the Minimum and the Catton inequality allow us to express the total carrying capacity of an ecosystem in terms of relationships between resource 'staves'. An ecosystem is always limited in terms of its carrying capacity by the shortest or most scarce of these staves.

The previous chapter has perused the concept of humanity as exuberant yeast, slowly suffocating itself in its own various waste products. This chapter now assesses the human ecosystem from the perspective of the detritivore, which is consuming the resources bequeathed to it at a rate much more rapid than their rate of regeneration.

Peak Oil

The most obvious and perplexing example of humanity's dependence upon detritus is the fossil fuel issue. As the humble yeast so eagerly laps up its sugar in the wine vat, so does humankind burn through the ancient reserves of stored hydrocarbon energy. Yet in this exuberance, not only does our civilisation pollute and degrade itself, but it also places a demand upon fossil fuel which is millions of times more rapid than its rate of regeneration.

The effects of this are twofold:

- Human civilisation becomes dependent upon a resource which will be depleted.

- The human population swells beyond the capacity that can be supported in the absence of this resource.

As we have already seen, such a scenario is utterly predictable ecologically, and commonplace within many biotic ecosystems, so discussion of the basic premise is trivial. What is of more interest within this chapter is the detailed assessment of what stage human civilisation has reached in relation to this phenomenon.

Perhaps unsurprisingly, several decades ago, M. King Hubbard predicted that humanity's dependence on fossil fuel was inadvisable, due to the certainty of its eventual depletion^[1]. More specifically, Hubbard predicted that the extraction of fossil fuel would peak and then begin an irreversible decline, before being depleted entirely. Most current estimates place the peak of oil production as occurring at some point between 2010 and 2030^[2].

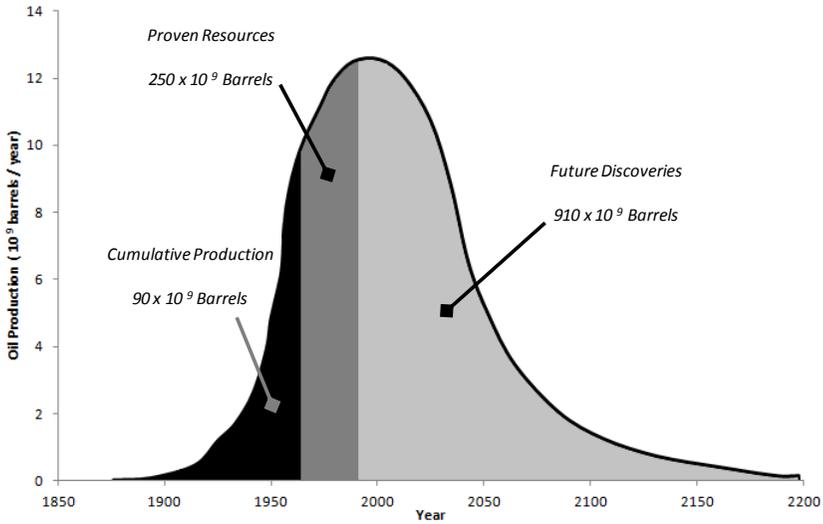
The Association for the Study of Peak Oil and Gas in North America uses various data sources to collate the peak year of oil production for each oil producing nation. A subset of this data is presented in Figure 1.11-1. As shown, many of the top producing nations have already peaked, and only a handful of significant producers remain without a clear peak. This small subset of producer nations represent around 2/3 of global oil production.

Despite this reality, much interest is heaped upon unorthodox extraction methods in order to access hydrocarbon energy in more awkward locations. These unconventional sources include tar sands, oil shale and deep water crude, and are typically much less cost efficient to access.

This progression of diminishing returns in fossil fuel extraction is fully in keeping with the graphic shown in Figure 1.11-1. As oil production peaks, producers must rely upon unconventional shale oil and tar sands sources, which offer the potential for large amounts of oil, but also require much more energy investment in purification and extraction in order to produce a unit of energy. As oil becomes more inaccessible and difficult to refine, the energy input required grows, thus diminishing the effective net energy value of each barrel of oil produced.

While we could delve more deeply into this issue and discuss specific figures relating to the peak of production, in its most basal form, oil is a textbook drawdown resource. As long as civilisation demands this resource at a more rapid rate than it is able to regenerate, depletion and overshoot is unavoidable.

So what is the current state of oil consumption? Figure 1.11-2 shows the trend in global oil demand. The more developed countries are perhaps surprisingly entering a decline in demand, due to improved energy efficiency and usage of renewable energy. However, the rest of the world are entering the ascendancy, and have surpassed the West in their demand for oil.



World Oil Production 2013						
Global Oil producer Rank	Producer Nation			Production Trends		Comment
	Production Increasing	Production Flat / Volatile	Production Decreasing	Barrels / Day	Peak	
1			Saudi Arabia	-110000	No	Top 10 Nations Produce ~2/3rds of global oil
2	Russia			145000	1987	
3	USA			1111000	1970	
4	China			25000	No	
5	Canada			-193000	No	
6			Iran	247000	1974	
7	UAE			-39000	No	
8	Kuwait			25000	1972	
9		Iraq		-36000	1979	
10			Mexico		2004	

Figure 1.11-1: Peak oil assessments - Full data available from [3]

While the decline in oil demand within the developed countries of Western Europe, North America and Japan is encouraging, we must remain focused upon the context which this decline fits into. With peak oil either imminent or in the recent past, how likely is it that the rest of the developing world can wind down their usage of crude oil as production rates fall?

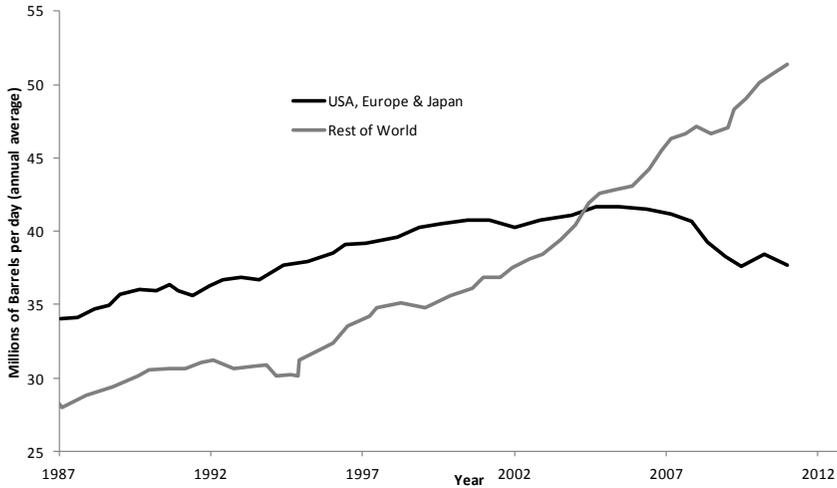


Figure 1.11-2: Trends in global oil demand (developed and developing nations) - Adapted by author from [4]

In 2005, the U.S. Department of Energy issued a report entitled *Peaking of World Oil Production: Impacts, Mitigation, and Risk Management*, which became colloquially named 'The Hirsch Report' for its lead author. In 2005, the West's consumption of oil had already reached a plateau and began to gently decline (as in Figure 1.11-2), however the outcome of the report pointed to the serious implications that the decline in oil production would have for the U.S. economy, and the wider world.

It proposed that a global mitigation plan would be required 20 years in advance to the peak of production in order to fully alleviate the economic and social upheaval that would occur post-peak^[5]. This is sobering reading, but it is important to understand that this forecast is entirely ecologically predictable from base principles.

What is equally important to understand here is that the market economy is fundamentally tied to the issue of peak oil in ways that are not often discussed. As we have seen in chapter 1.2, the market model fundamentally functions on a mechanism of cyclical consumption. Business models which are more aligned to this structure are more profitable within this kind of economy. The business model surrounding liquid fuel fits this model of 'economy' to a tee, as it breeds dependence upon a product which must constantly be purchased, as opposed to a more efficient and robust energy portfolio, based upon renewables, electric vehicles and microgeneration.

It is therefore not surprising that companies operating these business models are immensely profitable; 7 of the top 10 world's largest companies by revenue are petrochemical firms, and of the top 50, over one third represent oil and gas^[6]. Despite the salience of peak oil and how it is almost certainly imminent, the petrochemical industry still attracts investment of hundreds to thousands of percent more than the aggregate of the entire renewables sector. This is shown for North America in Figure 1.11-3.

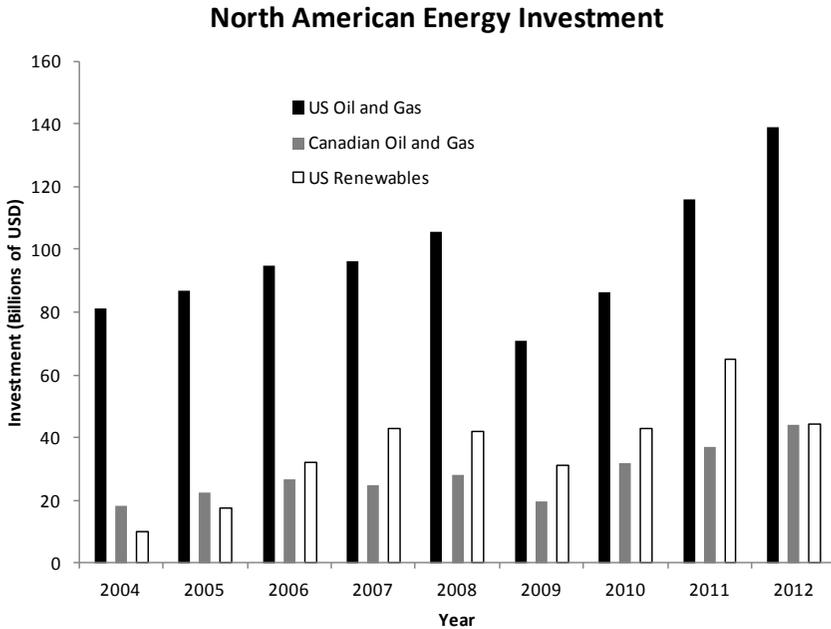


Figure 1.11-3: Yearly North American investment trends - Oil and gas versus Renewables - Adapted by author from [7]

So while we may rightly be concerned by the peak oil crisis, we must realise that the pseudo-evolutionary nature of our market economic system is simply operating within the basal ecological constraints of a detritus ecosystem. The profitability and economic domination of petrochemical firms is simply an expression of the values system within a detritus economy - raiding the stockpile in the short term is more profitable to the individual than temperance or restraint.

Boughey's pond is as apt a metaphor here as it ever was. Like the detritivores and bottom feeding fish, humankind has been bestowed a rich stockpile of leaves by chance of our ecosystem. We may buy and sell the leaves to one another for great profit, as the fish may compete with one another in similar ways, but the

fundamental problem remains the same; the resource will eventually expire, and with no adequate substitute, population crash looms.

Agricultural Markets and Erosion

In the previous chapter, we have already discussed the effects of large scale clearance of land for agricultural purposes, and how this acts to damage life supporting biotic ecosystems in the long term. However, there is another equally detrimental effect of this method of competitive industrialised agriculture.

The vast majority of our agriculture is dependent upon the humble soils of arable land. Despite its ubiquity, soil is actually a highly complex mixture of organic matter, living organisms, minerals and liquids that requires equally complex processes to form. Once formed, soil is naturally removed by the action of water or wind in a process called soil erosion, which has been occurring naturally for some 450 million years, since the first land plants formed the first soils.

However, we must make a distinction here between the natural background rate of erosion -which removes soil at roughly the same rate as soil is formed - and 'accelerated' soil erosion — loss of soil at a much faster rate than it is formed. Through poor agricultural practises, such as overgrazing or unsuitable cultivation, the land can be left unprotected and vulnerable, and soil may be detached, transported and deposited at rates and volumes which are much larger.

Professor Bruce Wilkinson of the University of Michigan has presented analysis to show just how prominent humanity's role in soil erosion is. Over the last 500 million years or so (on the geological timescale) the average loss of soil to erosion is approximately 60 feet every million years. However, when assessing the agricultural land in United States, where soil is being eroded by human agricultural activity, the rate of soil loss averages at around 1,500 feet per million years^[8].

Worse still, rates of soil erosion are observed to be higher for other agricultural land around the world. Natural processes operate over areas larger than those affected by human agriculture, but even taking that into account, humans move about 10 times as much sediment as all natural processes put together.

In 1990, the Global Assessment of Human-induced Soil Degradation (GLASOD) estimated that around 15 per cent of the Earth's ice-free land surface is afflicted by all forms of land degradation. This is shown in Figure 1.11-4.

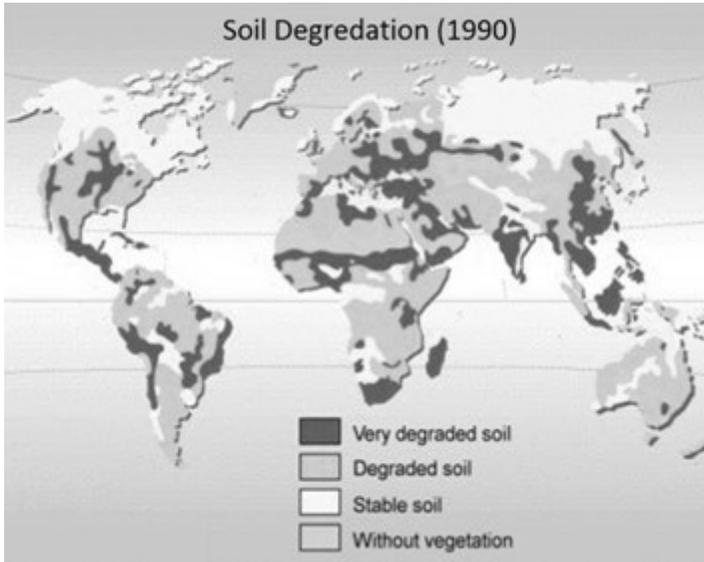


Figure 1.11-4: GLASOD Soil Erosion map - Adapted by author from [9]

So how does this relate to our view of humankind as the pool dwelling detritivore? To answer this, we must first look upon soil as a resource which has been bequeathed to us by an accumulation of natural processes over time. While we do not directly use the soil for energy or food, we must none the less consider it as a stave within our ecosystem. We require the properties of soil to grow food for our consumption, and thus to facilitate our ongoing survival.

As the agricultural revolution took hold, humanity awoke to a world of immeasurable stockpiled wealth. New technology allowed humans to use the rich build up of soil from our plant predecessors to grow huge amounts of food, and support a population boom. However, by exploiting the soil and degrading it at a rate that exceeded its rate of replenishment, human farmers entered draw down, and began stealing fertile soils from the future. The scenario is directly analogous to our usage of fossil fuel reserves.

As we have argued time and time again (see chapter 1.2), the high levels of consumption and waste in Western society are squarely attributable to the system of incentives encouraged by the market. Similarly, the needlessly high birth rates that exist within developing countries are also an indirect function of international economic inequality, as is so ingrained within market economics that prominent thinkers in its field will nonchalantly exhort its necessity (see chapter 1.8).

These two phenomena; voracious, wasteful consumption, and rising population load are factors which place the greatest stress upon global agriculture, but they are not alone. As we will discuss later in the chapter, the plague of the Marshallian firm model, and the idealised competitive business loom high over modern economics, and equally agriculture. Government institutions and free market think-tanks attempt to instil this idealised view of business (which we have debunked as falsehood in Chapter 1.6) onto the agricultural marketplace with some regularity.

The Agricultural Marketing Resource Center (AgMRC) is an American think tank which receives funding from the USDA Rural Development fund. It focuses upon giving farmers and producers advice upon how to market their produce in order to create a vibrant and competitive agricultural marketplace. However, in a policy paper issued in 2003, it clearly understood the issues associated with the agricultural marketplace, and its domination by very large, intensive producers.

"Although not unique to agricultural products, conditions in which little physical differentiation exists across available offerings are common in many agricultural markets (e.g., produce and milk). A critical problem associated with parity markets is that, by definition, the prototypical strategy for creating competitive advantages (e.g., differentiating a product along important core product attributes) no longer represents a viable approach for marketers of agricultural products. This might suggest that agricultural producers are destined to compete solely on the basis of price, which puts pressure on profit margins and, as a consequence, represents an outcome that favors larger enterprises over smaller, independent producers."^[10]

Despite admission that larger, more intensive firms intrinsically have an advantage on price over their smaller competitors (an accidental admission that the Marshallian model is bunkum), the policy think-tank ignores this, and instead makes one of the more absurd examples of free-market mental gymnastics yet heard;

"A second strategy for cultivating competitive advantages in the face of physical product parity entails adding irrelevant product features. Clearly, such a notion runs counter to traditional notions suggesting that differentiation must occur along core product attributes that are viewed as highly important and relevant to customers' buying decisions. Yet existing evidence supports the non-normative conclusion

that a product can be meaningfully differentiated through the inclusion of a unique attribute that objectively is meaningless or trivial with respect to product quality."^[11]

In this regard, the drawdown of fragile soils in order to boost yields is utterly inconsequential. What is of greater importance is the penetration into the marketplace by smaller firms in order to fulfil the Marshallian model of a competitive marketplace, even though larger firms are admitted to have efficiency benefits in the production of goods. Indeed, small firms are encouraged to grow by, in AgMRC's own words; writing objectively trivial and meaningless words on their produce.

Sadly, much international policies are similarly mired in meaningless drivel, and championing of the marketplace at all costs while turning a blind eye to wider implications. In a study of smallholder subsistence farmers by the International Food Policy Research Institute (IFPRI), a rare, reasoned conclusion is reached;

"While some smallholder farmers have the potential to undertake profitable commercial activities in the agricultural sector, other farmers should be supported in exiting agriculture and seeking nonfarm employment opportunities."^[12]

Despite this, a wealth of literature, produced both by the West and locally within developing countries encourage subsistence farmers to transition into fully commercial operation, in order to get the most from their land and drive economic growth. Many nations, including Sub-Saharan states, place this commercialisation of agriculture at the centre of their economic policy plans^[13].

This approach no doubt has some considerable benefits by pulling land-bound subsistence farmers out of poverty, but it is done so at the tremendous detriment of the robustness of the soil, and often artificially rides upon a wave of temporary means, such as inorganic fertilizers. This, in the long term, is utterly self defeating, and robs the future of its soil^[14].

Wider Resource Depletion

Like oil and other fossil fuels, resources which are non-renewable are subject to similar extraction trends. As the detritivore burns through the vast supply of energy supplied to it by ancient processes, it too comes to bear down upon other finite resources with its bloated population and consumption patterns. Like fossil fuel, the human detritivore consumes these other resources at rates which are far

beyond their rate of replenishment, and thus also begins to draw down these secondary resources.

Within human drawdown, once such resource is phosphorus. Segueing from our discussion of agricultural overfarming, no additional resource is more relevant to the world's food production issues than humble phosphorus. Phosphorus is a major active component in fertilizer, and is required in order for the fertilizer to function.

Despite this, expert research has shown that within 50 to 100 years, global reserves of phosphorus extracted from phosphate rock may likely be completely depleted, with peak extraction happening as early as 2030^[15]. The effects of the oncoming scarcity of phosphorus are not pleasant reading, with estimates of up to two thirds of the global population being almost entirely dependent upon phosphorus based fertilizers to maintain food yields on overfarmed land^[16].

A similar trend is emerging with copper. Copper is one of the most important manufacturing and industrial metals available, due to its high conductivity and malleability. It is used in almost every electronic item that you own, as well as in data cables, car radiators, refrigerators and water pipes, etc.

In December 2006, copper mining magnate, Ross Beaty shocked his audience at the Northwest Mining Association convention by stating that copper demand was increasing by more than 575,000 tons annually and accelerating^[17]. Based on these 2006 figures for per capita consumption, Tom Graedel, professor of ecology at Yale University estimated that by 2100, global demand for copper will outstrip the amount extractable from the ground. Graedel's calculations were of course mindful of the fact that copper is not like oil, in that it can potentially be reused, recycled and repurposed ad infinitum. However the paper concluded that even with this recycling in mind;

"Providing today's developed-country level of services for copper worldwide (as well as for zinc and, perhaps, platinum) would appear to require conversion of essentially all of the ore in the lithosphere to stock-in-use plus near-complete recycling of the metals from that point forward."^[18]

Despite this prognosis being echoed by business magnates and ecology experts alike, cornucopian surrealism remains strident in its defence of unchained economic growth. Julian Simon, a senior fellow at the libertarian-leaning Cato Institute has used copper specifically as an example to criticize the very notion

of resource depletion and peaking. In his book *The Ultimate Resource 2*, Simon uses the argument that ever improving extraction technology will continually bolster the known reserves of copper^[19]. It should be clear to the reader that this argument is the most simplistic cargoist ideal, as already discussed in Chapter 1.9.

Rare earth elements are perhaps a poignant addition to this discussion, as these precious substances are all but unknown to the public, despite being so ubiquitous within our high tech devices. Rare earth elements have found their way into the public consciousness via the lexicon of depletion, rather than the actual knowledge of their usage; as laypersons, we didn't even know they existed before we were told they were running out.

In 2012, China, the major global producer of these exotic metals, warned that after over 50 years of excessive mining, the country must restrict exports by using quotas to manage the decline of extraction. This line of action has been heavily criticised by other developed nations, due to the fact that so many modern products require rare earth elements in order to function^[20].

More examples are of course available, but this general trend of depletion is commonplace across nearly all forms of resources upon which humankind depends. In 2002, the World Wildlife Fund issued *The Living Planet Report*, which estimated that humanity is using over 20% more natural resources each year than can be regenerated, and this 20% is growing each year. Based upon likely scenarios of population growth, economic development and technological change, the report goes on to warn that by 2050, humans may have consumed between 180% and 220% of the Earth's biological capacity^[21]. How can it be that our civilisation is so wasteful?

The Price of Competition

An oft overlooked, but significant contributor to the immense wastage and resource inefficiency that underpins modern civilisation is also enshrined as one of the unquestioned pillars of market interaction. The idea that competition delivers the best possible product at the lowest possible price may hold tenuously for the market's preferred short term and individualistic incentive structure, but collectively, the axiom of competition resembles a classic collective irrationality with regards to resource depletion.

Within a market economy, the process of competition determines winners and losers based upon the perceived superiority of the products. However it is seldom considered that the losers are still made of *things*, and usually just as

many things as the winner. Enter a supermarket anywhere in the world today, and you will be greeted with innumerable duplicates and variations of items as mundane as toilet paper, bleach or white bread.

The shelf lives of these items will vary considerably, but the fate of the item should it fail to pique a passing customer's interest is depressingly consistent. The 'loser' in this market competition will likely be cast into a landfill, a fate which befalls a shocking proportion of our food produce every year*.

The resource efficiency of this aspect of the process is certainly questionable, but it is just one minor dimension of the inefficiency brought upon by the system of competition. It must also be considered that the loser items are manufactured, packaged and transported via processes which all consume additional resources, energy and space. Beyond foodstuffs, more technical loser items will have undergone research and testing, requiring investment from countless human man-hours.

The core of this issue lies in the fact that the value of a product is vindicated after it is already a product. The resources are gathered, the item is designed and manufactured, the item is packaged and transported, and only then are the previous actions validated via competitive market processes.

In a system based upon assumed infinite resources, under which the market paradigm came into being, this process is entirely justified, as the risk to the producer in bringing an item to market is the only real risk to consider. However under a depleting resource reality, the prerogatives of the system must be inverted, as the risk of extracting resources when there is insufficient demand (or rather requirement) acts only to increase the severity of the scenario.

Again, credence must be given in some form to the idea of recycling, as this does much to truncate the severity of depletion. However, as already discussed within chapter 1.2, even within a system where all material is recycled, duplication and unsuccessful products still represent energy expenditure in a world which is marching toward energy scarcity.

Furthermore, such duplications call for duplications of manufacturing facilities, transport infrastructure and design processes in parallel. The resources expended in this arms race of production are not reclaimed by recycling, and can never hope to be.

* *A recent article into the waste occurring in UK supermarkets showed that as much as half of produce stock can end up being wasted - see [22]*

The humble concept of packaging grants a further axe to grind against this idea that competitiveness is intrinsically an efficient manner of discourse. Packaging has become indispensable in differentiating between similar products and creating strong brand identification. In the world of marketing and branding, the nature of a product's packaging ranks as one of the most common topics of discussion and debate.

Yet packaging waste represents a significant proportion of waste within economies. According to the Scottish Environmental Protection Agency, packaging makes up as much as 10% of the total waste in the UK, and this number has been much higher in the past^[23].

This packaging wastage is tremendous, and the volume of packaging is significantly exacerbated by the concept of market competition. As we have discussed in chapter 1.2, the usage of packaging for sundry items was relatively rare during the mid 1800s - disposability was simply not a cultural force at this time. It is only with the artificially intense competition of modern market economics that such wars between otherwise mundane items are waged based upon ostentatious packaging.

Furthermore, the increased requirements of transportation within a globalised market economy present further packaging woes. As farmers are convinced to ship their produce further and further afield in order to develop new customer bases and take advantage of untapped market share, their temperamental foodstuffs must suit up for the journey. To vacuum pack a lettuce or cucumber in a sheath of plastic would be unthinkable to the craftsman era Americans of the 1800s, yet this is a total banality in modern groceries and foodstuffs.

Conclusions

Discussion of humankind's path toward overshoot makes for profoundly sobering reading, but none the less, a great deal of criticism of the market incentive system can be gleaned from these dire omens. As we have seen, the peaking of such a wide variety of natural resources is driven by a combination of artificially high consumption rates, and rising human population.

As we have demonstrated in chapters 1.2 and 1.3, high consumption rates within developed societies are wholly manufactured as a means of quelling overproduction and maintaining market functionality. This is encouraged through the various arts of obsolescence. Furthermore, a compelling argument can be made from chapter 1.8 that rising population numbers, primarily driven

by the developing world, are exacerbated significantly by economic inequality, which is the modus operandi under a system of self directed individualism.

All of these trends are pseudo-evolutionary abstractions which culturally mimic the natural exuberance observed within biotic ecosystems, such as our leafy pond example. As such, the outcomes are banal and predictable, but still spell the end of human civilisation if an alternative path is not sought. We must also be wary of the cargoist talking points that will so confidently allay our fears by appealing to some wondrous cornucopian technology, which will allow markets to blaze on unabated.

Chapter 1.11 - References and Notes

- [1]. M. King Hubbert. *Nuclear Energy and the Fossil Fuels*, Drilling and Production Practice (1956) American Petroleum Institute & Shell Development Co. Publication No. 95, See pp 9-11, 21-22 .
- [2]. Steve Sorrell, Richard Miller, Roger Bentley, Jamie Speirs, *Oil futures: A comparison of global supply forecasts*. Energy Policy 38 (9): 4990–5003. (September 2010)
- [3]. Steve Andrews, Randy Udall, Steve Andrews, *The Oil Production Story: Pre- and Post-Peak Nations*, Association for the Study of Peak Oil USA, June 2014
- [4]. Mamta Badkar, *New World Oil Demand Blasts Past Old World*, Business Insider, 24 Jan 2012
- [5]. Robert L. Hirsch, Roger Bezdek, Robert Wendling, *Peaking Of World Oil Production: Impacts, Mitigation, & Risk Management*, AIChE Journal, Vol. 52, No. 1, January 2006
- [6]. Information taken from Wikipedia - https://en.wikipedia.org/wiki/List_of_largest_companies_by_revenue
- [7]. Andy Stevenson, *5 Reasons Why the State Department Gets Tar Sands Development Impacts Wrong in Keystone XL Review*, Natural Resources Defense Council, March 4, 2013
- [8]. University Of Michigan. *People Cause More Soil Erosion Than All Natural Processes*. ScienceDaily, 4 November 2004
- [9]. L.R. Oldeman. R.T.A Hakkeling, W.G Sombroek, *World Map of the Status of Human-induced Soil Degradation: An Explanatory Note*. Wageningen, International Soil Reference and Information Centre, Nairobi, UNEP
- [10]. Michael J. Barone, Thomas E. DeCarlo, *Emerging Forms Of Competitive Advantage: Implications For Agricultural Producers*, Center for Agricultural and Rural Development (CARD) & Agricultural Marketing Resource Center, MATRIC Research Paper 03-MRP 5, March 2003, pg1
- [11]. *Ibid* pg14
- [12]. Shenggen Fan, Joanna Brzeska, Michiel Keyzer, and Alex Halsema, *From Subsistence to Profit: Transforming Smallholder Farms*, International Food Policy Research Institute (IFPRI), July 2013, pg16
- [13]. R. A. Nyikai, *Commercial and subsistence Farming: What is the future for smallholder Kenyan agriculture?* African Crop Science Conference Proceedings, Vol. 6. pp591-596, 2003

- [14]. Mulugeta Seyoum, Heluf Gebre kidan, *Effects of N and P fertilizers on Yield and N uptake of flooded rice grown on Vertisols of Fogera Plain, Ethiopia*, Journal of Agricultural and Rural Development in the Tropics and Sub- Tropics, 2005, Vol 1, Iss1, pp47-51
- [15]. Dana Cordella Jan-Olof Drangert, Stuart White, *The story of phosphorus: Global food security and food for thought*, Global Environmental Change, Volume 19, Issue 2, May 2009, Pages 292–305
- [16]. Michael Pollan, *The Omnivore's Dilemma: A Natural History of Four Meals*. Penguin Press (11 April 2006)
- [17]. Dorothy Kosich, *Ross Beaty's decade-long copper dream comes to an end*, MineWeb, 18 June 2014 - <http://www.mineweb.com/uncategorized/ross-beatys-decade-long-copper-dream-comes-to-an-end/>
- [18]. R. B. Gordon, M. Bertram, T. E. Graedel, *Metal Stocks and Sustainability*, PNAS Vol 103, No.5, 31 Jan 2006
- [19]. Julian L. Simon, *The Ultimate Resource 2*, Princeton University Press 1998
- [20]. Chinese Information Office of the State Council, *Situation and Policies of China's Rare Earth Industry (White Paper)*, 20 Jun 2012
- [21]. *Living Planet Report 2002*, World Wildlife Fund, pg 19
- [22]. *Tesco says almost 30,000 tonnes of food 'wasted'*, BBC News, 21 October 2013 - <http://www.bbc.co.uk/news/uk-24603008>
- [23]. Scottish Environmental Protection Agency (SEPA) - <http://www.sepa.org.uk/regulations/waste/packaging-waste/>

1.12 The Misaligned Cost Constraint

COST IS A MECHANISM by which we live and breathe. For all but the super rich, the purchase of an item or service will be heavily influenced by its monetary cost. Parliaments and senates across the world quibble and bicker over the costs of policies to the taxpayer ad nauseum, while corporations carefully weigh their strategies against the immutable logic of cost. This immutable logic is the driving force of market economics; costs must be outweighed by benefits. It is an intuitive axiom, and one which is difficult to disagree with. However, as the title of this chapter implies, disagreements are indeed to be had.

What will be argued here is a point that again links back to the idea of ecology, individualistic, pseudo-evolutionary notions of value, and how these factors relate to macroscopic societal success. By understanding the fundamental idea of value, both at the level of the society and the individual, we can gather a greater understanding of monetary cost, and how one is not necessarily indicative of the other.

Societal Notions of Cost

Costs and benefits are ever present in evolutionary theory. Within animals, competition for mates incurs much higher risks of conflict than over food or territory, but this potential cost is offset by the more substantial benefits of reproduction. Cost and benefit analysis is therefore not solely a human invention, but rather a model of what is naturally self evident. The drumbeat of natural selection stands as testament to the instinctual nature of cost-benefit analysis within all lifeforms as a force for survival.

Humans do however stand separate to animals in some regards; our abilities to foresee, to predict and to understand our environment far exceed those of our animal relatives. These abilities have enabled us to break our biological shackles and suppress our instinctual cost-benefit analyses to a degree.

Our reason allows us to look beyond the direct individualistic motives which drive natural selection and adopt more collectivist 'evolutionarily novel' behaviours. Such trends, such as empathy for strangers, may have little relevance to the individualist, but if reasoning from a collectivist standpoint, the benefit to society is apparent (see chapter 1.8).

Our ability to break free of the staunch evolutionary vestiges of our being is however limited. Though humans are no longer subject to natural selective pressures to the extent of our animal peers, our society remains a haphazard mishmash of individualistic evolutionary metaphors, and collectivist cultural expressions.

Our justice system stands as a collectivist force which enshrines our individualistic ideals of morality – that crime should be punished. Our governments stand as the defining ideal of collectivism, yet they compete on a grander global stage as a single, selfish player in a competitive market. The right and left political spectrum which we have come to love and hate even seems to mirror these differing interpretations of cost, with rightists supporting individualistic social Darwinism, and leftists championing collectivism and equality.

Underpinning all of these ideas is the function of cost. Returning to Dawkin's forest (see chapter 1.9), we can see our individualist trees straining ever higher to reach the sunlight, unperturbed by the costs they are incurring. As the trunks grow larger to support this quest skyward, more and more nutrients are required to satisfy the tree's hunger. Luckily, the goal of each tree in the forest is entirely aligned with this individualist way of thinking. Each lifeform seeks* only to live long enough to reproduce and sire more lifeforms. That single benefit outweighs all costs incurred in growing to such unwieldy size.

As humans, our motives are (hopefully) more eclectic than this. We may seek to master our career, a sport or hobby, experience interesting places or events, or discover and create, of course in addition to settling down and raising children. I have attempted to aggregate the wishes of the vast majority of people in the deliberately open question; "*Is the current social system the most beneficial model for humanity?*" at the opening of this section.

So let us apply the same logic: is the individualistic model of cost beneficial to humanity? Could humans prosper in Dawkin's forest? If our goal is to sustain a

* *There is actually no seeking; this is merely a process that occurs.*

prosperous and beneficial civilisation for humanity, can a purely individualist model of cost deliver? This will be the underlying direction of this chapter.

Failure of Accounting for Emergent Cost

Consider an automotive company, specialising in the manufacture of cars. It is a fairly typical outfit, catering neither for luxury or budget cars, but general purpose, average day to day vehicles. As with all companies, the producer is subject to global market pressures, and must therefore sell vehicles in order to prosper. The logic is simple and immutable – the company must sell more cars than its competitors while keeping its costs as low as possible.

This requirement leads to certain behaviours being adopted, and certain decisions being made within the company that affect the products that are produced. For example, the company may desire to implement underhanded tactics to sell more cars through perceived or planned obsolescence. For simplicity, let us suppose that the company does not indulge in tactics to this effect any more severely than any other competitor within the marketplace.

In order to keep costs low, the company uses average quality materials and subcomponents to produce the cars, and designs do not typically spend a great deal of time being optimised. The vehicles remain fully compliant with all safety requirements, but are not particularly high in quality. Customers are generally satisfied with the vehicles, as they have sufficient reliability, adequate performance, and are priced well for working families or young car owners.

This is a fairly typical scene within any market. A company prospers by creating products that appeal to a large number of people. Within the market, it is likely that a handful of similar firms exist, each with differing levels of market share.

Now, if presented with the question 'where are the costs in this industry?', even most economically uninitiated individuals will probably hit the nail on the head first time. The costs may be from the design process, manufacturing, materials, factory rental, upkeep, and employment of a labour force. More economically astute individuals may divide these costs into fixed and variable subcategories, but the answer remains banal.

However, we must augment this question slightly in order to make this answer absolutely correct. For the list of costs above to be the answer, the question must be phrased:

“From an *individualist* standpoint, where are the costs in this industry?”

This augmentation allows us to glance back at our answer and see just what we have stated. What we have in fact given is a list of direct costs that affect the producer. What we have totally neglected here is the collection of additional costs that will be incurred by the surrounding society due to this industry.

Like the neoclassical economists who bravely covered their ears to criticism, we seem to be obsessed by the idea that collective well being is merely the sum of all individual well beings; however this is very clearly not true. Despite the simplistic nature of this example, there will be costs that are incurred by the society which are complex, chaotic and unpredictable.

As a simple example, while low cost automobiles allow a greater proportion of people to access transport on demand, the aggregate result may not necessarily be a cheaper and more efficient transport system, but rather a more costly and inefficient one. More cars on the road puts a larger strain on transport infrastructure, which in turn makes the transport infrastructure less efficient. City centres around the world have average traffic speeds which are frankly laughable^[1], and subsequently woefully wasteful of both fuel and time.

Under the neoclassical perception that value and cost within a society are simply the aggregated values and costs of all actors within the society, this conclusion makes no sense. The cost-benefit analysis of the manufacturer is rational, as a profit is being turned, and the cost-benefit analysis of the consumer is also valid, as the customer is satisfied with the purchase. Yet at a societal level, the outcome is a scenario which is inefficient and costly.

Where have these costs come from? Neoclassical economic theory steadfastly clings to its ideal that a society is simply the sum of its parts, yet emergent phenomena are clearly active at a societal level which cannot be readily modelled through conventional market exchange. We may label these as 'emergent costs', i.e. costs which emerge only at the level of the society. Crucially, these costs cannot be modelled under a conventional individualist incentive system.

It is interesting to note the role of modern government taxes in all this. Governments often introduce taxes or fines on undesirable behaviours in order to coax businesses and consumers away from such behaviours. A business tipping toxic or dangerous waste into the ocean may seem fine and dandy from an individualist standpoint, but as soon as a government begins taxing the company for their pollution, the game has to change.

These kinds of strategic taxes* are a frantic attempt by a battered and bloody collective medium to account for the emergent cost of such activities. From an individualist standpoint, the company has nothing to lose by polluting so long as profits remain adequate. However, the local community must put up with the polluted region, and the associated costs. These costs must be recouped from somewhere, and it is in theory these strategic taxes which do so.

The government are unfortunately dealing exclusively in a monetary system which is designed from the individual viewpoint, so while such taxes are sometimes introduced, and have the desired effect, the approach is easily corruptible (see chapter 1.7). Emergent cost is simply too complex and too unpredictable to be adequately targeted by our primitive, individualist currencies. As such, many collective irrationalities and emergent phenomena go entirely unnoticed by the modern monetary system.

The failure to eliminate these prevailing, invisible costs may prevent us from adequately addressing the problems of climate change and resource depletion (which are ironically emergent costs in themselves). One of the most criminal and poorly understood failings of individualist notions of cost is outlined in the following sub-section.

Intrinsic Obsolescence

Intrinsic obsolescence is a term which as far as I am aware was invented by filmmaker Peter Joseph^[2], figurehead of the sustainability organisation known as the Zeitgeist Movement. Intrinsic obsolescence is somewhat different to the other forms of obsolescence which we have covered, as it is largely unconscious, unplanned and hardwired into the wider culture of market economics.

Revisiting our car manufacturer in the previous example, we can see that the manufacturer purchases materials and components which are of adequate quality, spends a suitable amount of time on design of the product, and generally satisfies its customers with the final product.

Now, the reason these vehicles are not built to a higher quality is relatively simple; the manufacturer is constrained by cost. The requirement for the manufacturer to turn a profit demands that a balance is struck between the affordability of the product and the cost to produce.

As such, while the vehicles sold are at a level of quality which satisfies consumers, they fall far short of the possible technical design and build quality

* *I would like to point out that not all taxes are so well intentioned.*

for their function. This is not seen as a problem within the cost mechanism of the market, as both the customer and the producer are satisfied by the trade.

However, at the macroscopic level, there are invisible costs incurred due to the inferiority of these products, in comparison to what could feasibly be produced using the best possible approaches. The costs may be fuel inefficiency, lack of reliability, poorer safety, poorer performance etc. While each consumer may feel that the product is adequate, the top level view is a transport system which is significantly less efficient and more costly than it could be. Again, haphazard government taxes attempt to rectify this, by progressively introducing emissions or safety regulation which price less efficient cars off the road.

While some automobile manufacturers, such as the Ferraris and Bugattis of the world, may come close to engineering perfection with their products, they are produced as artistic pieces, rather than useful tools*. However, envisage a transport system where every car on the road was at the absolute pinnacle of engineering performance, reliability and efficiency. Not only would this greatly reduce the looming threats of climate change and peak oil, but it would improve the performance of the infrastructure as a whole. The reason for not attempting to make this reality you ask? The cost of such a task observed by individual actors within the economy, despite the overwhelming value that would be created.

This is the crux of intrinsic obsolescence; products which are satisfactorily produced under the individualist cost mechanism are almost always poorer quality than what is technically possible at the time, leading to a situation where emergent aggregated costs are incurred at the macroscopic level.

Granted, these costs may be negligible, but likewise they may be catastrophic, and the individualist cost constraint of the market has no way of adequately quantifying this. An interesting example of this kind of effect is the energy wasted by heating intrinsically obsolete houses. Every year, 75,000 homes can collectively waste an amount of energy equivalent to the Gulf Oil spill^[3]. While the cost to insulate these houses and improve their heating performance is cheap in comparison to the emergent costs incurred, actions by home owners and governments to combat this cost have been sporadic and piecemeal due to the direct individual costs involved.

* *The Bugatti Veyron, like many other supercars, was actually produced at an economic loss.*

Again, imagine the possible energy savings if these intrinsically obsolete houses were retrofitted with the best possible insulation and heating technology, utilising renewable energy and sustainable building techniques. The strain on the energy sector would be drastically reduced, as well as savings on the energy bills of the households involved. Such an eventuality however is painfully unlikely, and this is due to the ever present constraint of cost.

Emergent Costs

But the idea of cost within a market society is not tied to the mere production of goods. The world echoes with the sound of governments debating the costs of various social programs, welfare schemes and healthcare systems. These debates are inextricably linked to the lives of real people, including you or me. Despite this, the individual costs must invariably take precedence, often weighed against the unrealistic talking point of national debt (see chapter 1.4).

Perhaps one of the most pertinent examples of emergent cost from a human perspective is the effect of inequality. As we have seen from chapter 1.8, the distribution of wealth within a society can cause a rich portfolio of dysfunctions.

The distribution of wealth is traditionally seen as a distribution of merit. While this has already been critiqued, let us suppose for a moment that it is in fact true, and that income is generally distributed to people based upon their level of contribution to society; would this be an adequate model for social organisation?

From a conventional market standpoint, each actor will tend to chase value and avoid unnecessary cost in order to remain competitive. Out of this competition will arise a hierarchy of merit with various different stratifications. All actors across the economy will pursue value to the utmost extent, and minimise cost wherever possible, aggregating to a society where cost is minimal and value is high.

However, the chaotic social effects of inequality upon groups within the society are not considered here. The interplay between various social classes is a characteristic which cannot be modelled at the level of the individual, as it is fundamentally collective in nature. Therefore, the higher occurrences of mental illness, crime and other disorders within unequal societies cannot be quantified by a solely individualist doctrine.

These societal trends have real costs. Alleviation of social dysfunction requires investment, either via justice systems or healthcare. Because these costs are not direct or immediate from the perspective of the individual, the market

fundamentally cannot model them. Similarly, such social dysfunction produces additional costs which are nuanced, complex and impossible for markets to react to - such as social cohesion, levels of trust or general wellbeing* .

These costs act to worsen the lives of those within the society, yet they have emerged from a scenario where all individuals are justly rewarded based upon the competitive maximisation of individual value - the market ideal. The emergent costs of complex societies are therefore potent and must be considered.

The Value Argument

The primary aim of currency is to facilitate the exchange of value, by creating a central medium against which all values may be measured. If I hold £10 in my hand, I know that this amount of currency can purchase varying amounts of goods and services, in theory based upon the value which those goods and services embody. I may be able to obtain one pizza, or one music CD using my £10, but my £10 would not get me very far towards purchasing a car or house. The basic rationale behind this is that houses and cars offer more value to me than CDs and pizza.

While there are few who would argue with the difference in value between a pizza and a house, the failings of our currency system to properly model value within the greater world are painfully apparent. Take as a prime example, the long suffering economy of Greece, which has been in the doldrums of recession since the financial crisis, and has more recently been gripped by the misplaced fervour of austerity. Within Greece, the population in larger cities are falling back to basal barter economies, and a service based proto-economy known as time banking^[4].

The significance of barter in this case is that, for all intents and purposes, the basic structure of this economic model is identical to monetary capitalism, with one exception; barter does not have an agreed currency to facilitate exchange. People continue to trade valuable goods for individualistic mutual gain, but the value which the good represents is not tallied using a recognisable medium. The good is simply taken for what it is, as measured directly against the value of other items.

For example a person may desire a gold necklace, and so would offer a book to the seller to trade. The seller would refuse, as the perceived value of the

* *Chapter 1.8 has conclusively shown that each of these phenomena are exacerbated by wider income inequalities.*

necklace is higher than a single book. The buyer may then revise the trade to include several books, perhaps some which are rare or valuable. The seller would then agree to the trade, as the perceived value of the necklace has been met or exceeded. While currency is absent, the central trade mechanism, and the concept of value is unaltered.

Time banking is largely an extension of the same barter idea, but is designed in order to facilitate exchange of valuable services rather than products. Each person with a skill offers an hour of their time for an hour in return. A person may be skilled at hairdressing, and so would cut a families hair for one hour. In return the family may offer the services of their son, who is a skilled mechanic and could repair the hairdresser's car. In Greece, time banking is being used to facilitate exchange of everything from counselling to massages, and all without any form of currency.

So why are these trends significant to our discussion? It is because they underline the complete failure of modern currencies to capture the concept of value. The Greek economy is demonstrably bustling with value; from the goods that are filling up the barter economy, to the valuable services being exchanged by time banking. Despite this, each actor within the economy has no way to exchange this value for individual and mutual gain, because the currency system is unsound, i.e. there is ample value, but no money to represent it.

The reason for this monetary scarcity has already been visited in chapter 1.4, and it is linked directly to the market incentive within banks leading them to make money by selling money. However, the effect of this monetary creation scheme permeates far more deeply than the broad macroeconomic issues relating to debt; it has come to warp our very concept of what value is.

Value is a fundamental concept of human society, and without a rigorous understanding of what value is, and how to maximise it, economics is all but useless as a philosophy, never mind a science. In a debt backed economy, value cannot be adequately tallied and accounted, as currencies are solely a reflection of the incentive structure within banking institutions, not impartial measurements of exchange.

But even before the evolution of such debt backed leveraging, when currency was tied to gold and thus relatively stable, the nuances of value remained inherently difficult to model. Within a complex, interlinked economy, there are gradations of value which manifest only at higher vantage points across the macroscopic scale, and are thus generally absent from monetary representations.

To a trader in the marketplace, it may seem as if only the value of traded goods is relevant, but to the observer at the level of the township, such a bustling market may degrade the quality of life of nearby citizens. To the regional authority, surging sales in the markets may bring about unmanageable waste in the local landfills, and erode areas of natural beauty. Climbing to a higher vantage point allows us to see the flows of value for what they really are, and how positive results at the micro scale, can become negative when all is accounted.

A diagram exemplifying gradations of value is shown in Figure 1.12-1, adapted from the brilliant work of the MetaCurrency Project. The horizontal axis represents the gradations of value as they rise through various levels. Note that a higher level does not necessarily mean that the value at this level is more valuable than lower levels; it is simply the level of vantage across an economy at which this type of value becomes visible. As such, the highest level of value is the emergent subset, simply because this type of value cannot be invoked until everything else has been taken into account.

The concepts introduced here are challenging, as such, it seems beneficial to explore gradations of value by using an example. The MetaCurrency Project (who's ideas will be discussed in great depth later in the book) explore this concept through the whimsical story of Milly the Cow^[6], and since farmyard animals can lighten the mood of seemingly any topic, I will stick to the script.

Milly is a cow owned by a farmer. Despite the seeming simplicity of farmyard economics, Milly the cow presents an interesting example of gradations of value. Like any other cow, Milly is valued for her meat. Entering Figure 1.12-1 from the bottom left hand side, we arrive at tradeable value. As crude as it may sound, Milly may relatively easily be dismantled into component parts and sold as a product. The meat sold will bring the farmer revenue; nothing surprising here.

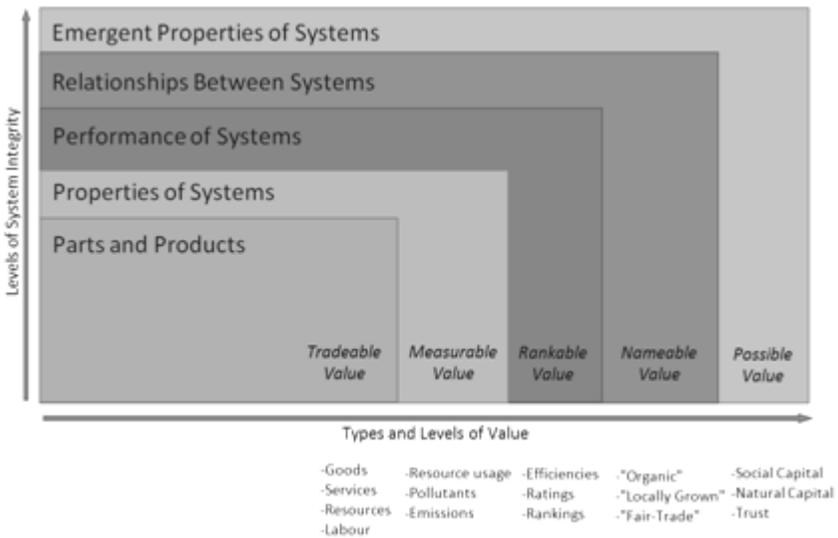


Figure 1.12-1: Example of value gradations within an exhaustive model of value - Adapted by author from [5]

However, progressing up and right across Figure 1.12-1, we arrive at the realisation that Milly, like all living things, is actually a system. She requires grass to eat and pollutes the environment with methane, but also produces milk at a certain rate. These are her measurable values, which arise simply from her functionality as a system.

Continuing up and across Figure 1.12-1, we arrive at a higher vantage point than before. We are now in a position to determine the performance of Milly as a system in comparison to other similar systems. We may deduce that Milly is able to yield more milk per unit of grass and methane than any other cow in the field, and as such is ranked 1st in the herd. This is Milly's rankable value in comparison to other systems of the same type.

However, in order to progress further to a yet higher vantage point, we must begin scrutinising Milly against other criteria, and how she fits into the bigger picture. In order to do this, we must focus on the relationships between systems, and how systems both upstream and downstream of Milly are enriched or hindered. The world of nameable value is where things begin to get less cut and dry.

Within the globalised world of trade, Milly may find that her meat or milk is sold overseas. The relationship of Milly with whoever buys her products or

services downstream is thusly affected, as if sold within the region, Milly's produce may be labelled as "locally grown" and potentially made more expensive.

Similarly, the relationship of Milly's produce with systems upstream of her may also affect her nameable value. If the farmer decides to feed her solely with a natural diet, she may be sold as "organic" or "grass-fed" while if fed on hormones and other artificial means, Milly may yield more produce, but lower quality produce which will not carry a nameable value.

The final layer of the onion is the emergent layer of value, which is constantly evolving based upon all other criteria which precede it. It just so happens that Milly's position as number one milk cow in the herd has attracted a fanbase of children. The children are enamoured with Milly for her unique personality and unrivalled milk production. The local interest has led to Milly being enrolled in a competition by the local school, who have also adopted her as a mascot for the football team.

From the farmer's point of view, it may seem lucrative to sell Milly for meat or run her into the ground giving milk, but from higher vantage points, we can see how these pursuits of value undermine others. The value of Milly in the local community may galvanise town spirit and enable greater levels of value to be invested in the local area. The effect of this emergent morale may far outweigh the benefits of selling the meat of one cow.

Now admittedly, this story seems farfetched, but the overarching point of this is that value exists in ever increasing levels of complexity, as viewed from ever rising vantage points. Even within this simple example, we can see that our current model of currency captures raw extractive tradeable value very well, and goes some way to representing certain aspects of measurable value, but its accuracy steadily declines from then onwards.

The important question arising from this is, without a sound and comprehensive representation of value, how can actors within an economy ever hope to exchange value effectively when our model of currency can only accurately capture a limited spectrum? With all this in mind, it does not seem at all surprising to look at the wastage which our current system espouses when our

currency systems are so skewed toward the extractive, tradeable forms of value* at the most basal level.

This quandary has resulted in the formation of several sprawling projects, attempting to create a new model to measure value within an economy. The difficulty in articulating these arguments to the general population remain central to the uptake of new-value systems, but none-the-less, think-tanks such as the Ingenesist Project†, and proposed systems such as the LET System (Local Exchange Trading System) are gradually gaining steam. The LET System in particular, defines the problem of modern currency in an especially concise and clear manner:

"All over the world communities suffer from a shortage of money, simply because there is only so much of it, it's gone elsewhere and they can't print their own.

When you think about it, this situation is nonsensical. Money is merely a means of exchange, a set of tickets, a number in your bank account. It has no value in itself - you can't eat it, wear it or build anything with it.

It is a measure of value, like an inch measures length or a ton measures weight. There need never be a shortage of the measure.

Imagine a carpenter not working because he has run out of inches!"^[7]

Yet that scarcity of a measurement facility remains the defining factor in a huge swathe of our decisions as a species. This scarcity of the unit we use to measure value has profound knock-on effects into the nature of our resource usage, which we will discuss presently.

Scarcity as a Prerogative

Through no other social phenomenon is the extractive model of value exploited more effectively than through the principle of artificial scarcity. We may define

* *In reality, our current economy is actually more heavily skewed toward speculative value, which cannot accurately be represented on Figure 1.12-1. The original figure by the MetaCurrency project - from which Figure 1.12-1 is derived - actually includes a box for the speculative economy which sits off the scale to the bottom left, suggesting that this aspect of the economy is not a natural system at all; a sentiment which I tend to agree with.*

† *The discussion covered by the Ingenesist Project is perhaps worthy of a book in its own right - for more information, go to: <http://www.ingenesist.com/>*

artificial scarcity as the purposeful or indirectly disincentivised withdrawal of efficiency or abundance, in order to safeguard active market prerogatives.

The idea of artificial scarcity is one which has heavy overlap with intrinsic obsolescence, but differs on a few key criteria. While withholding technical efficiency through intrinsic obsolescence is an unconscious necessity in order to remain competitive, artificial scarcity is a conscious effort to veto, undermine or withhold efficiency or abundance in order to maintain a business model.

The most pertinent example of enforced artificial scarcity strikes me each time I visit a cinema. The modern cinema exists as a bubble of unimaginably sparse scarcity, often within cities of relative abundance (at least by comparison). Within the cinema, no food or drink from outside may be consumed under penalty of exclusion.

Despite the fact that one could very easily have brought a selection of snacks from home, the diktat of the cinema demands that vastly inflated prices are paid for low quality foods. Bringing food from home would create a veritable abundance within the maintained bubble of scarcity, thus mitigating the potential extractive value to be gleaned from consumers. Plainly; scarcity breeds dependence

This approach to marketing is often colloquially referred to as selling to a 'captive audience,' but in reality, this general style of scarcity maintenance permeates to some extent across almost all marketplaces, in order to boost the extractive value turnover. Energy companies, as we have seen, are keen to lobby against energy portfolios which may hinder the ability for value to be extracted from consumers.

The presence of cheap, abundant energy from the sun, and other sources pose issues for these institutions, as it lessens the effective scarcity of energy, and hence the consumer dependence upon extractive business models. Similarly, companies which deal in raw materials are keen to downplay the volumes of their reserves in order to artificially maintain higher prices and hence greater turnover.

In addition, the effect of scarcity allows commodities to more readily be fetishised as symbols of status or power. High quality goods become the reserve of the elite within a society only in part because they are of high quality, but also due to their scarcity, and hence exoticness. Realistically, there is no natural law which dictates how quality must be distributed throughout a society. What if the

highest quality goods and services were accessible for all? Would this stifle the incentive to work hard* and condemn all individuals to complacency? Or would such a scenario unlock the hidden potential of those unable to channel their ability? Would it lead to a world of unparalleled energy efficiency due to the usage of better technologies across social classes?

The answers to these questions are not available to us, as under the extractive model of value, such worlds of efficiency are too costly. More importantly, such eventualities are anathema to the fetishised world of luxury goods. The Ferrari would simply not cut it in a society where sleek, high performance, high efficiency, luxurious automobiles are the norm.

Similarly, if Ferrari decided to channel their engineering knowhow into making luxurious, high performance, high efficiency vehicles for the everyday man, they would utterly destroy their brand status, and most likely not sell many cars in the process.

As such, the engineering prowess of high level sports car manufacturers must remain behind sealed doors, and only be unleashed to satisfy the token purchases of the rich and famous, thus maximising allure and safeguarding the future of the company.

We may conjure a plethora of examples of businesses boosting their profits by withholding technical efficiency or abundance, but many of these have already been well documented elsewhere. The key point to understand here is the underlying logic of such behaviours. At its most basal level, the actions of all of these interest groups are essentially preventing a phenomenon, be it technology, social change or government, from bringing food into their cinema.

But what are the costs associated with scarcity which are passed on through the society? While the producers of these products benefit from extensive profits due to exploitation of extractive value, the emergent costs which are incurred are too large to accurately quantify. What we can say is that, as already suggested, a world where the most efficient, most high tech equipment is used wherever it is needed is one which does not fear climate change or peak oil.

Absurdly, this obsession with scarcity permeates far beyond actual physical resources. The digital world of media and information is limitless in its ability to replicate data and present it identically to millions of people around the world.

* *A critique of the idea that human motivation is driven by the pursuit of money and goods is the topic of chapter 2.3*

Yet this world of near infinite resource is constantly beset by corporate bought laws, attempting to maintain their scarcity based income models.

The likes of SOPA, CISPA and the numerous other digital laws which have assaulted our parliaments are simply the bare faced attempts to fight abundance and uphold scarcity, rather than adapting and finding new business models within the altering technological landscape.

Constrained to Cost

An emergent property of money's failure to correctly account for value is that cost is frequently used as a veto for change or development. Many examples can be plucked from the air. Climate change is perhaps the most ludicrous example of 'costism,' where governments, corporations and think tanks squabble over the costs of infrastructure and procedural changes to combat global warming. Yet not for a moment is it considered that the cost model which constrains these actions is invalid in such discussions.

The cost of aligning infrastructure with global warming targets is centred upon the individualistic notions of competition, and yet the nature by which these costs were incurred was wholly emergent in origin. Despite this, much discretion surrounds the politics of cost. Different political parties can apply different levels of emphasis to various costs across society in order to tailor to their own ideologies, or the ideology of their financial backers.

The enormous cost of the Iraq war - estimated to be nearly \$2 trillion in 2013^[8] - did not dissuade the USA and its allies from military intervention in the country, because of the complex ideological, geopolitical and financial politics involved. This is over 10 times the amount of money required to achieve the climate change targets for the entire developing world, and over 20 times the amount of money begrudgingly pledged by the developed world UN Framework Convention on Climate Change (UNFCCC) Cancún Agreements^[9].

Why can the enormous costs of the war in Iraq be tolerated, yet the meagre comparative costs of preparing the world for the effects of climate change are scoffed at repeatedly? Is the threat of climate change not greater than that posed by the Iraqi Baathist regime? The answer is of course that cost is deeply subjective, and is slanted heavily toward the individualist motives of the marketplace.

There is a cynical, bipolar understanding within states and corporations that currency can indeed be created on a whim, contracts can be drawn up for

billions of dollars, and the profits plundered without concern. Government debts can be extended when required, and debt ceilings lifted if beneficial. Interest upon the government debts can be paid by the sale of more illusory bonds ad infinitum.

Yet elsewhere, crippling, internally inconsistent phobias related to the narrow interpretation of cost may be used to veto non-profitable improvements in society. In these circumstances, the absurdly gigantic government debts are upheld, and paraded as the reason why the people cannot have what they require. Poverty, economic inequality and unemployment are issues which stand as among the most damaging and derided in modern society, yet they are obviously problems which are entirely soluble once this staunch costism is rescinded.

As we have seen in chapter 1.5, the eccentric desire of Williamson to employ the poverty stricken and work-deprived had remarkable rejuvenative effects that were long lasting and far reaching, despite the fact that they were employed to construct a folly.

Imagine a modern Williamson, employing the poor, the unemployed and underemployed with a \$2 trillion war fund at his disposal, to repair ailing infrastructure, to build new, efficient homes and tend to other projects which are sorely needed. What profound effect this would have upon society? We will likely not know the answer under this paradigm, as we solely look upon the cost of such a campaign measured through our limited currency and our ideological cynicism. Thus the potential value, positively oozing from those underutilised, is left untapped to corrode society through the effects of inequality and chronic unemployment.

Value and Cost in Nature

As discussed in the previous chapter, humankind's exuberant growth, and its pseudo-evolutionary system of market discourse results in ecologically predictable degradation of surrounding ecosystems and life supporting services. We have already perused this phenomenon from an ecological perspective, but there is an additional economic perspective which is important to grasp.

As the financial representation of value which we use is fundamentally tied to the market incentive system, and thus is individualist and profit oriented, the ramifications of its usage in society results in certain environmental emergent costs which cannot properly be accounted for. In economics, this effect is naively known as the externality.

The basis of this is that the direct market incentives which encourage extractive, profit based value are often to the detriment of other, higher order real world value. As we have already seen, nature provides humans with incredibly valuable services which support or improve human life. The system of economics based upon the market price mechanism is intrinsically insensitive to these valuable services, because they are complex, chaotic and not obvious from an individualist standpoint.

Increasingly, attempts are being made by inter-governmental institutions to account for these valuable services, and hold corporations and governments to understand the natural value that their day to day business relies upon, takes for granted or erodes through external costs. A graph of the costs related to the degradation of natural capital is shown in Figure 1.12-2.

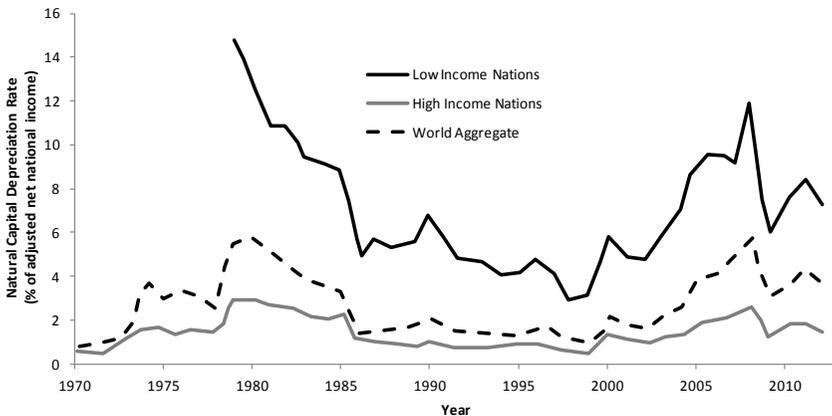


Figure 1.12-2: Depreciation of measureable natural capital in low and high income nations - Adapted by author from [10]

While the percentages may seem small in relation to the net national income, consider the effect upon a nation if a 2-6% fine was applied to the books every year due to the damage caused to natural systems. This value would likely eclipse, or seriously reduce any economic growth that the nation enjoyed that year. What is perhaps most convincing in this demonstration is that, as implied in the previous chapters, supposed economic growth is wiped out when the costs of drawdown in carrying capacity are considered. It is therefore demonstrable that economic growth in the modern era has been primarily based upon extraction of resources at unsustainable rates.

This however is beside the point. What is of more interest here is the general philosophy of how our notions of costs are inherently flawed and superficial, and how this shortcoming results in staggeringly large costs being completely ignored. In a 2010 study by TRUCOST, it was estimated that at least \$6.6 trillion of damage was done to natural systems in 2008 alone^[11]. This value represents 11% of total global economic output, and is nearly 4 times the size of the 3.0% global economic growth claimed for this year. Of this, the top 3,000 private companies were responsible for over \$2 trillion worth of damage^[12].

This failure of our currency and market system to account for value is damning. In the tomes of economic data, despite the eventual downturn of the financial crisis, 2008 still ranks as a year where globally generated value supposedly grew by 3%. Despite this, the world in 2009 was actually trillions of dollars worse off due to the damage done to natural ecosystems.

This failure to properly account for nature is however frustratingly pervasive in our market based society. Even those on a small local level, be they business owners or politicians, are equally illiterate and blinkered by the conventional sense of cost and value.

In 2007, Edward Barbier, professor of economics at the University of Wyoming produced a study on mangrove trees in rural Thailand. Mangroves provide four essential ecosystem benefits to humans: wood and products such as shellfish, plants, honey and medicines; nursery and breeding grounds for offshore fisheries; storm protection; and carbon sequestration. However, since the 1970s, Thailand has lost approximately one third of its mangrove through conversion of the land to shrimp farms. These shrimp farms have contributed significantly to Thailand's economic growth through export^[13].

Barbier's analysis (Figure 1.12-3) shows that conversion of the mangrove wetland into shrimp farms has large economic benefits in terms of private profits i.e. the land is more profitable as a shrimp farm than a mangrove wetland. However, much of these profits are bloated by government subsidies, which, when subtracted, narrow the profit gap significantly. Furthermore, when the mangrove wetland is valued for its many life-supporting functions as described above, and the shrimp farm valued including its effects on water pollution, the shrimp farm reveals itself as a large economic burden in comparison to the mangrove wetland.

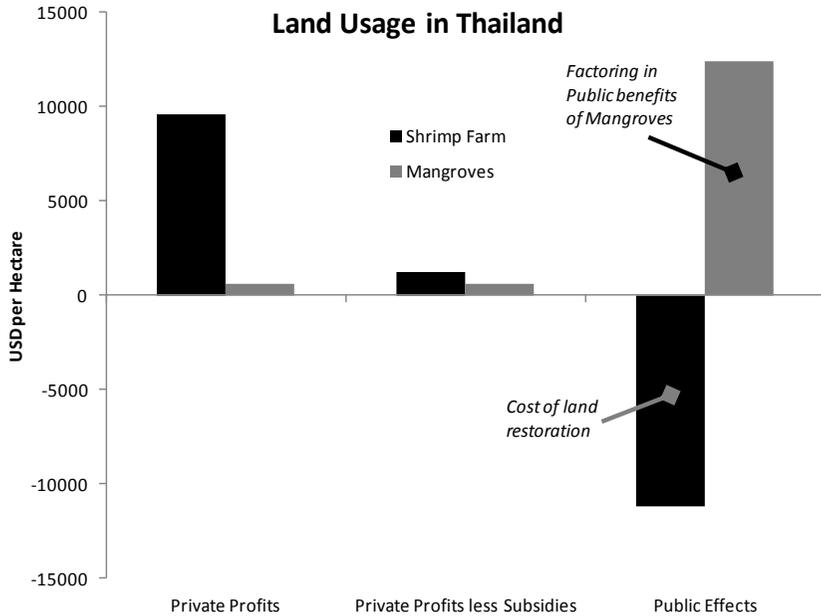


Figure 1.12-3: Assessment of natural value in mangrove land usage - Adapted by author from [14]

Similar analysis has been carried out in other nations, industries and scenarios, and the results consistently show that the extractive, market-based value of a natural system is frequently outstripped by its natural, life-supporting value.

In a study by TEEB (The Economics of Ecosystems and Biodiversity), the effect of the lumber industry in China was assessed. Over the period 1949-1981 China logged some 75 million hectares to satisfy demand for timber for construction and other uses. The ensuing rapid deforestation resulted in the loss of ecosystem services, notably watershed protection and soil conservation.

In 1997, severe droughts caused the Yellow River to dry up for 267 days, affecting industrial, agricultural and residential water users in northern China. The following year, devastating flash flooding occurred in the Yangtze and other major river basins, resulting in the loss of 4,150 lives, displacement of millions of people, and economic damages estimated at \$30 billion)^[15].

Figure 1.12-4 shows the market cost of timber in relation to the wide variety of environmental disasters which followed. The value of the timber gained from the spate of deforestations is significantly less than the resulting damages stemming

from it. What is perhaps telling is that the 1998 flood represents a small proportion of the total damage in relation to general precipitation and water runoff. These costs however are much less obvious, despite being greater.

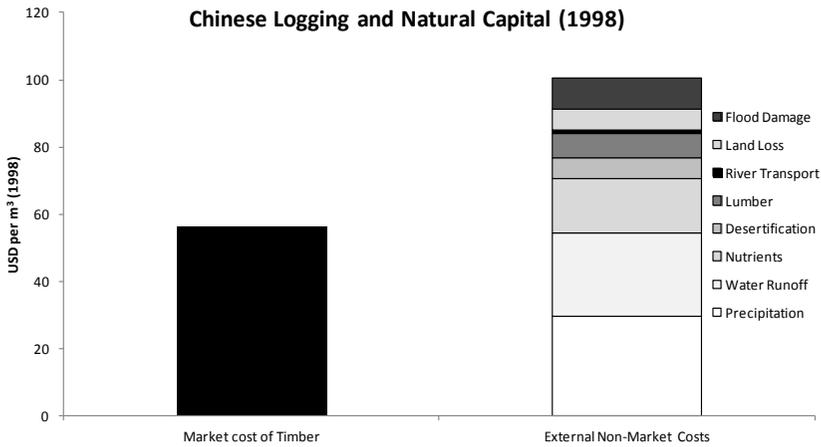


Figure 1.12-4: Extractive, market value vs. natural capital in Chinese logging industry - Adapted by author from [16]

So why does nature seem to go under the radar when we are accounting for value and costs? The reason is once again linked to our modelling of value as an individualist, profit based and primarily extractive currency. The costs incurred due to the degradation of nature are felt in a dispersed, delayed and complex manner, which is not in keeping with the conventional views of profit and loss.

Despite this, TEEB and other organisations have been fighting for many years to make a representation of these costs appear in company ledgers. Their results have not been overwhelming, as like any augmentation of the market incentive, their push must be through the corruptible realm of institutional regulation. Convincing powerful, globalised companies that gigantic swathes of their profits must be paid back as penance for natural damage is a very tough case to sell.

Decoupling of Economics with Reality

At the end of 2010, China made its indelible mark on the global economy by surpassing Japan as the world’s second largest economy based on GDP. Despite the tremors of apprehension this created across the American dominated economic landscape, Japan understandably downplayed the succession. Japanese Economics Minister Kaoru Yosano stated that "*as an economy, we are not competing for rankings but working to improve citizens' lives.*"^[17]

Despite the circumstances of the situation requiring Japanese economists to shrug off the loss of face on the global stage, the statement from Kaouru Yosano rings with a certain clarity which is often neglected in the modern political arena.

Yet it is not just politicians who fall into the unyielding belief that economic growth indices are the be all and end all of measuring social health. In 2010, UK Prime Minister David Cameron announced a £2 million policy to quantify and record the happiness of the population, "*It's time we admitted that there's more to life than money, and it's time we focused not just on GDP but on GWB - general wellbeing.*"^[18]

Despite the inadequacy of GDP to measure softer social nuances such as personal and communal well-being, the proposal was looked upon as "woolly"^[19] by opposition and the public alike.*

What is it that makes us so unable to see the world without peering through the goggles of economic theory? Approaching either a learned or uneducated individual in the street and asking them what shape the country is in will likely prompt a discussion of the health of the housing, stock or labour markets, and the present state of economic growth. But does this collection of financial statistics really capture the true state of a country?

This ingrained economic outlook is fundamentally institutional, and it grows from the trend of decoupling the laws of economics from reality. Once upon a time, it may have been true that the economic jargon of the markets did in fact have a powerful bearing upon the average man or woman on the street. When the factories buzzed with activity, employment was high and labour's share in the productivity of the economy was more obvious and equitable, a case may be made for the importance of economic indicators.

However, the tenuous grasp that economic theory has on reality has been weakening for some time. Just as economics and well-being seem decoupled that a Prime Minister is forced to propose a separate measure, the study of economics and the actual economy of trade are too diverging at a staggering rate. According to der Spiegel, in 2010 the sum total of the money in financial markets was over 25 times greater than the value of all goods and services traded

* *We will see in the next chapter that growth is indeed not as closely correlated with well-being as many would hope.*

on the planet, and this trend is growing^[20]. An illustration of the relative size is shown in Figure 1.12-5.

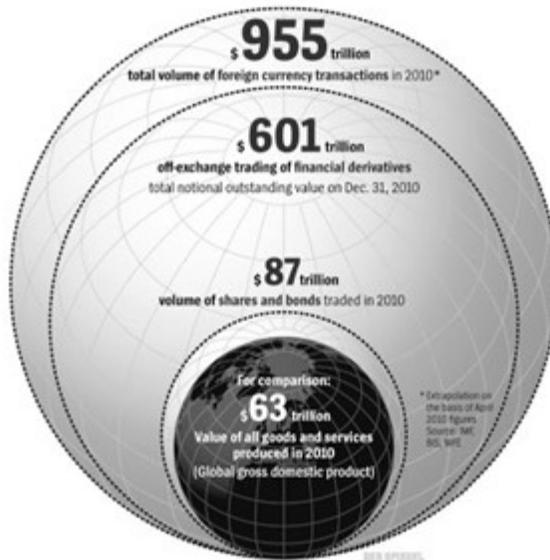


Figure 1.12-5: Illustration of financial markets in relation to actual goods and service markets - Adapted by author from [21]

This huge layer of abstraction between actual goods and currencies, stocks, bonds, derivatives and other complex financial measures was summed up pleasantly in a tongue-in-cheek parable by John Kay of the Financial Times. In this parable, crowds of onlookers become so wrapped up in devising complex and accurate measures attempting to correctly guess the weight of an ox, that the ox died from starvation, as nobody remembered to feed it^[22].

This is directly analogous to the real goods and services based economy - speculators and currency traders devise convoluted methods to take advantage of price trends, all the while, the humble families of Greece are reverting to barter as their ailing currency withers around them.

The reason why well-being and economics are so tenuously linked is simply another manifestation of the failure of modern currency to model value. This too extends into the abstraction above the actual economy, as the individualist prerogative of actors in the economy is to make profit, regardless of how it is done.

This is why nearly \$1,000 trillion is circulating within the enormous FOREX markets, as traders constantly try to make profit by converting currencies back and forth. On a macroeconomic scale there is literally no value to this pursuit, as it barely even acts to affect the actual relative values of the currencies by any meaningful amount, yet it is encouraged by the blinkered interpretation of value that the market system perpetuates.

Conclusions

As we gradually approach the end of the 'reasons to change' section of the book, we find that a lot of congruence between our various arms of study begin to emerge. As discussed in our assessments of human ecology, the market system perpetuates a concept of pseudo-evolutionary fitness (enshrined as profit) which is staunchly individualist in nature. As we have seen in this chapter, the economics of this value model results in various costs not being properly accounted for within society.

These costs would indeed also be completely invisible to the yeast in the winery vat. It is only through our intuition as humans that we are able to broach this topic and critique our own system of value. Despite this ability, the simplistic and powerful prerogatives that act within a market system are incredibly beguiling, and it is the result of these prerogatives, and the manner by which we measure them, that sees a world where the meaningless speculative economy is so bloated in relation to actual real-world value. It is similarly the reason why gigantic societal costs incurred by our exuberant growth are swept under the carpet.

The root of this is fundamentally the simplistic and individualistic motive of profit maximisation, and it is only by attempting to rein in this mechanism, through legislation, regulation or new, dictated accounting techniques that any limited progress has been made to make the market even concede that such externalities are real.

Chapter 1.12- References and Notes

- [1]. *Average speed in Europe's 15 most congested cities in 2008 (in kilometers per hour)*, Statista - <http://www.statista.com/statistics/264703/average-speed-in-europes-15-most-congested-cities/>
- [2]. The Zeitgeist Movement, *The Zeitgeist Movement Defined: Realizing a New Train of Thought*, CreateSpace Independent Publishing Platform; 1 edition (22 Jan. 2014)
- [3]. Brian Merchant, *Each Year, 75,000 Homes Waste as Much Energy as Contained in Entire BP Gulf Spill*, TreeHugger, June 15, 2010 - <http://www.treehugger.com/corporate-responsibility/each-year-75000-homes-waste-as-much-energy-as-contained-in-entire-bp-gulf-spill.html>
- [4]. *Greece's alternative economy with bartering*, BBC News, 19 January 2011 - <http://www.bbc.co.uk/news/world-europe-12223068>
- [5]. *Ideas behind the MetaCurrency Project*, MetaCurrency Project - <http://www.metacurrency.org/ideas>
- [6]. *Ibid*
- [7]. Michael Linton, Angus Soutar, *The LETSsystem Design Manual, 1.1 Money and Community*, Landsman Community Services Ltd, 1994 - <http://archive.lets.net/gmlet/design/dm1%5E1.html>
- [8]. Daniel Trotta, *Iraq war costs U.S. more than \$2 trillion: study*, 14 Mar 2013, Reuters - <http://www.reuters.com/article/2013/03/14/us-iraq-war-anniversary-idUSBRE92D0PG20130314>
- [9]. Framework Convention on Climate Change, *Report of the Conference of the Parties on its sixteenth session, held in Cancun from 29 November to 10 December 2010*, 15 March 2011
- [10]. E.B Barbier, *Account for depreciation of natural capital*, NATURE, VOL 515, 6 Nov 2014, pp32-33
- [11]. *Putting a price on global environmental damage*, TRUCOST, 05 October 2010 - <http://www.trucost.com/news-2010/100/putting-a-price-on-global-environmental-damage>
- [12]. *Ibid*
- [13]. S. Sathirathai, E.B. Barbier, *Valuing Mangrove Conservation In Southern Thailand*, Contemporary Economic Policy, Volume 19, Issue 2, pages 109–122, April 2001
- [14]. E.B Barbier, *Account for depreciation of natural capital*, Nature, Vol 515, 6 Nov 2014, pp32-33

- [15]. *TEEB For Business*, The Economics of Ecosystems and Biodiversity, 2010, pg 5 1
- [16]. *Ibid*
- [17]. *China overtakes Japan as world's second-biggest economy*, BBC News, 14 February 2011 - <http://www.bbc.co.uk/news/business-12427321>
- [18]. *Government 'planning to measure people's happiness'*, BBC News, 15 Nov 2010 - <http://www.bbc.co.uk/news/uk-politics-11756049>
- [19]. *Plan to measure happiness 'not woolly' - Cameron*, BBC News, 25 Nov 2010 - <http://www.bbc.co.uk/news/uk-11833241>
- [20]. *Out of Control: The Destructive Power of the Financial Markets*, Der Spiegel, 22 August 2011
- [21]. *Ibid*
- [22]. John Kay, *The Parable of the Ox*, Financial Times, 24 July 2012 - <http://www.ft.com/cms/s/0/bfb7e6b8-d57b-11e1-af40-00144feabdc0.html#axzz3NmIf9quO>

1.13 The Exponential Growth Fallacy

THE FINAL CHAPTER of our 'reasons to change' section of the book is a discussion perhaps of the most frustratingly obvious shortcoming of our socioeconomic system. It is an assumption that is baked into the policy and rhetoric of governments at the most fundamental level, and penetrates deep into the most basal motives of corporate operation. This phenomenon of course, is the concept of economic growth.

Yet despite the pervasiveness of economic growth in the schema of society, and its centrality to nearly all governmental policy, few understand the dire ramifications of a conceptual model in which the economy grows by a few percentage points each year.

The action of growing an economy by a percentage year-on-year may seem a benign and sensible path to take within a market system, but the wider mathematical ramifications of this desire to grow are poorly grasped within the population. By adding a percentage of the previous year's product onto the current year's product, and then aiming for a further percentage on top of this year's product in the coming year, we arrive at a function which is exponential. It results in a rapid quickening of gains which are compounded year-on-year.

Indeed, if we peruse the growth in average global GDP across the modern era, the relationship is almost textbook in its reflection of an exponential progression. This is shown in Figure 1.13-1. Note especially that the assumed cataclysmic effects of busts, crashes and market contractions are almost invisible on this scale, due to the sheer rapidity by which economic growth soars skyward. Indeed, since the great crash of 1929, global economic product has grown by a greater amount than the time between 1929 and the Norman conquest of Britain in 1066.

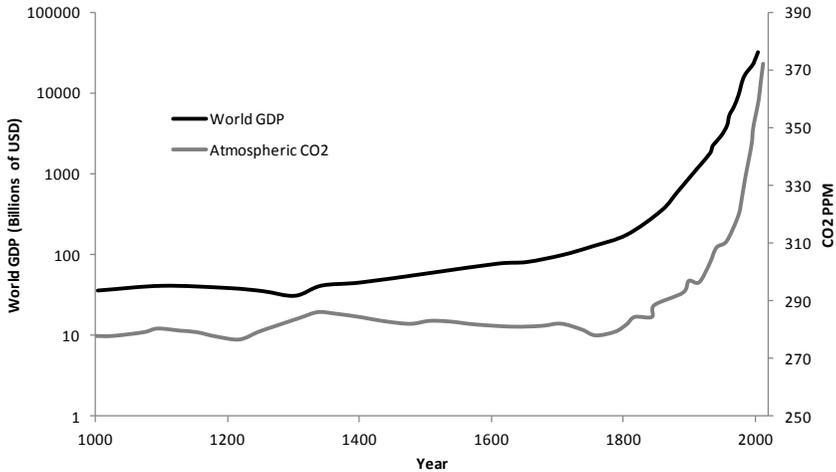


Figure 1.13-1: Plot of exponential progression of GDP over time - CO₂ data included for interest - Plotted by author from [1]

"But why is this phenomenon important?" I hear you ask. "Surely this is merely a reflection of the ascendant ability of the market to deliver gains at an ever faster rate." Yes, it is undoubtedly a reflection of the amount of goods, capital, financial products and services in circulation, so diverse and numerous that both William the Conqueror and Herbert Hoover would have struggled to imagine them. But there is a more insidious undertone to this ascendant growth, and it is the blinkered ignorance of this numbingly obvious fact that must condemn growth in the strongest possible terms. This fact is that the world is finite.

Exponential, ever-increasing growth is a function which trends toward infinity. As the global domestic product becomes larger, so too does the margin by which it grows each year, as these are expressed in percentages. The human mind typically struggles to comprehend this progression due to the rapidity by which it accelerates. As such, literature is full of pedagogical parables of the folly of those who fail to understand how exponential patterns grow with frightening rapidity.

Once such story, taken from the *Shahnameh*, an epic poem written by the Persian poet Ferdowsi between c. 977 and 1010 CE, tells of the inventor of chess, who shows his invention to the ruler of the country. The ruler was impressed by the game and gave the inventor the right to name his payment. The cunning inventor asked the king that, for the first square of the chess board, he would receive one grain of wheat, two for the second one, four on the third one, and so forth, doubling the amount each time.

The king quickly accepted the inventor's offer, even getting offended by his request of such a low reward, and ordered the treasurer to count and hand over the wheat to the inventor. However, when the treasurer took more than a week to calculate the amount of wheat, the ruler asked him for a reason for his tardiness. The treasurer then gave him the result of the calculation, and explained that it would take more than all the assets of the kingdom to give the inventor his reward^[2].

The broad lesson in this is that exponential patterns grow incredibly, almost unimaginably quickly. From one grain of wheat on the first square of the chessboard, by the 64th square, the inventor would have gained 18,446,744,073,709,551,615 grains of wheat, or approximately 18 quintillion!

On a finite planet, we are also playing on this chessboard. While we may not double our grains of wheat each year, we none the less add a couple of percent for each and every successive square. For each square, we demand more and more wheat to heap up. The resources we demand must be drawn from the finite earth which we inhabit. As we have seen, many of these resources are already being extracted at rates which exceed their replenishment. How, under such circumstances, can economic growth still be such an axiom of our political and corporate landscape. As with much of our pseudo-evolutionary market model, the answers lie within the realm of ecology.

Reflections on Exuberance

As shown in Figure 1.13-2, our economic growth and our population growth are almost perfectly aligned. One is intrinsically related to the other, and this is intuitive given the way our market system functions; more people means more produce, more services, more turnover, etc. The relationship between population and economic growth is however rarely discussed within society. Economic growth is viewed as an improvement of service, product or financial performance, rather than the basic fact that there are more people year-on-year to buy and sell items.*

* *Note that this relationship holds very well over long time periods, but economic growth is a much more complicated phenomenon in the short to medium term, as we will discuss later in this chapter*

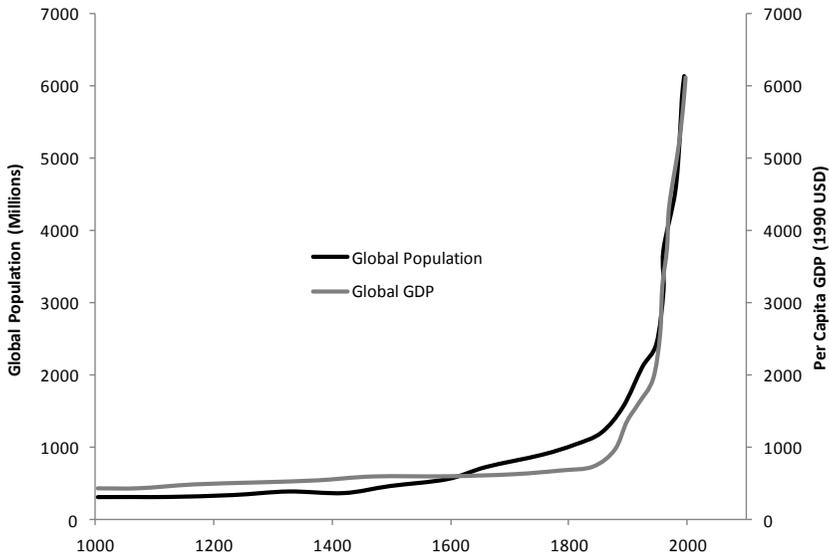


Figure 1.13-2: Economic Growth and Population Growth - Adapted by author from [3]

Growth of a population within a biotic community is a powerful phenomenon. Constrained by the static limits of an existing ecosystem, the population will typically oscillate around the carrying capacity relatively benignly, giving an approximately flat trend over time. However when offered new resources, this population can grow to meet its new capacity. In the wild, this pattern is largely understood, but William Catton eloquently applied these animalian observations to the growth of human civilisation. This view is interesting to contrast with the traditional idea that human history has been paved by technological, economic and social ascendancy, rather than banal population dynamics based upon ecological prerogatives.

A market oriented worldview often points to the post war 'Golden Age' of growth as a proof of the superiority of market commerce as a vehicle of prosperity. The period from the end of the Second World War saw the organisation of the Bretton Woods system, which allowed nation states to trade more openly through newly constructed institutions, such as the International Monetary Fund. The era is marked by consistent 4-5% growth in the West, strong union movements, relatively low inequality, and is generally looked upon as a positive and productive era.

Cultural and artistic memes enriched and diversified Western countries, with the birth of rock and roll and pop art in the 1950s. The counterculture of the sixties

saw sexual liberation and socially acceptable drug use become widespread amongst the young. Martin Luther King Jr. fought for racial equality on the grandest stage, culminating in the end of the divisive Jim Crow Laws in 1965. Manufacturing productivity soared, and in Western Europe, near full employment was attained through reconstruction and modernisation of war torn townships. In 1948, we saw the establishment of the UK's National Health Service, the publically funded healthcare system which still exists today.

Given that the only underlying dynamic which drove society forward at this point was an essentially identical market incentive system, is it valid to write off the market incentive as a vehicle of prosperity? Given that such openly social and collectively oriented projects as the British NHS, or the Union movement could come to prosper under a market model, can we not see our modern corporatist economy as the exception rather than the rule?

The answer to the above question is difficult, and cannot be discussed fully beyond the lens of ecology. Granted we may assess that under market incentives, a great deal of benefits were reaped during this period, but we must consider that the world was a rapidly changing place. The post war economic boom is perhaps the finest example of near-global exuberance available for us to peruse. The birth of the American dream perhaps stands as a strong example at a national basis, but the post war expansion witnessed significant prosperity in America, mainland Europe, Asia and even the Soviet states to a limited extent.

The end of the Second World War presented us with a world ravaged and left in ruins. America's eventual intervention in the war had propelled the nation to superpower status, and with its newfound riches it stood fast against the rise of communism by investing billions of dollars in Western Europe. The Marshall Plan as it became known initially showed little promise, but soon the magnitude of the reconstruction effort absorbed labour and safeguarded jobs.

The Western world emerged from the warring turmoil as a far more cohesive unit, seeking to secure prosperity through solidarity, rather than aggression. As we will see, this feeling of camaraderie and togetherness is indicative of exuberance in our mammalian kin. The interrelation of ecological exuberance and high employment due to liberalised international trade and post-war reconstruction led to significant economic growth, partially reinforced by the baby boom.

This expansion of population and economic activity was made possible by the assumed limitless reserves of drawdown fossil fuel at our disposal, through

improved drilling technologies. The cornucopian ideal was cemented as central policy, and commercial banks indulged themselves, loaning money into existence at ever increasing volumes from the 1960s onwards. This point is crucial, as the link between drawdown and our population exuberance is indelible. On the back of this wave of energy stolen from the future, and money loaned from the future, our metaphorical economies began the exponential ascendancy which is normality today.

However, ecology demands that exuberance is not eternal, and by the 1970s, the limits to this ascendancy began to rear its head. The rampant expansion of Western money supplies saw the Bretton Woods system decouple from gold in 1971, and left currencies as floating points in an event dubbed the Nixon Shock. This event caused ripples across the global economy, and in part led to the OPEC oil embargo of 1973, and the related stock market crash of the same year.

Almost immediately, the West witnessed what William Catton has termed 'post-exuberant despair.'^[4] What is especially interesting regarding this phenomenon is that it is well observed and well understood in the animal kingdom, particularly in mammals. From a population standpoint, mammalian post exuberance is often characterised by a decline in societal cohesiveness. Hierarchies become more ingrained and isolationist, the young and the outsider are viewed as intruders and violent, aberrant behaviour is exacerbated. Such studies are well documented in rodents and primates^[5].

In humans, the effect of post exuberance manifested within Western civilisation in unsurprisingly similar ways. The 1980s saw increasingly authoritarian governments sweep to power, with Thatcher in the UK disassembling the unions and most publically funded ventures. In the USA, Ronald Reagan set deregulation in motion and top bracket tax cuts in order to favour the wealthy.

Rich and powerful businessmen began to more flagrantly wield their influence to protect themselves, as the social hierarchy became more pronounced. As we have seen, inequality soared as a result, as wages for working people and middle earners remained relatively stagnant.

Despite the continuing growth of an increasingly abstract and speculative financial economy, the face of post-exuberance remains thinly veiled. Western nations struggle to register positive population growth without immigration, and post-exuberance xenophobia does much to ostracize this influx. Institutions of prejudice are safeguarded and reinforced by this feeling of malaise and despair,

with the British National Party growing steadily since its inception in 1982 and securing record numbers of domestic and European parliament seats in 2009^[6].

In the UK, hatred of welfare seekers evolved in tandem with this post exuberant scapegoatism, worlds apart from the fervour and support for the introduction of these socialised schemes in the exuberant late 1940s. A long similar lines is the stagnation of race relations, with the rise of articulate and well informed 'race realists' convincing despairing Westerners that the fault does not lie with them, but solely with people of different skin colour.

But we must however not be hasty in drawing conclusions that this malaise is definitively post exuberance. While it seems very likely, and fits all the criteria, we must consider that America saw a similar explosion of exuberance in the roaring twenties, followed by rising inequality and authoritarian hierarchical ideology in the run up to the great crash of 1929. Similarly, the European enlightenment was a considerable period of cultural and economic exuberance, which was itself limited by the century long decay of colonialism through revolution and war in America and France, and the imperial reshuffle of World War I.

Again, the mechanics of human society are complex and cannot be attributed to a single cause, but viewing these periods, and the countless others like them, through ecological terminology offers interesting insight. The idea of carrying capacity is one which we have already been introduced to, and human's ability to augment carrying capacity through trade, technology and conquest of new territory is demonstrable.

Viewing the American twenties through a lens of carrying capacity is interesting, as no additional land was gained, yet exuberance seemed to manifest itself regardless. Our metaphorical growth model however operates at a level of abstraction above the raw materials of carrying capacity, and while America did not gain land in this period, it gathered economic capacity through other means; trade and technology.

Following a brief recession after World War I, the Republican government funded massive scale transport and electrical infrastructure, and urbanisation rose sharply. The breakthrough of mass production allowed businesses to sell much more at much lower prices, and export trade increased in tandem^[7].

Hollywood and the cinema industry boomed, while black jazz music and sexual liberation became prevalent amongst the so called 'flappers' of the younger

generations. Minority groups and homosexuals began to be treated with a greater level of respect than experienced before, or significantly after the period, and women's suffrage extended to all states allowing voting equality. Gender parity became more pronounced as unmarried women increasingly worked part time clerical jobs within the cities. While labour unions were generally frowned upon, business leaders such as Henry Ford espoused attitudes of fairness and respect for workers, and moral ideals toward customers.

The tact of the United States during this period brought exuberance which was relatively short lived, as almost as soon as it began, inequality began to rise, through the treatment of immigrants, unions and the prohibition of alcohol.

The exuberance of this period was somewhat tainted with the hallmarks of despair. This was possibly due to the fact that the financial abstractions of growth through trade and other means of capacity augmentation were at best temporary. The foreign reactions to protectionist tariffs, and the fairly rapid recovery of Europe due to Versailles reparations, caused American export markets to have limited potential for further growth, especially in agriculture.

When further artificial growth proved impossible, and Wall Street crashed in 1929, this seething post-exuberance propagated, and the country entered a bitter depression which they would not escape until World War II. Further breakthroughs in carrying capacity augmentation, and an increased trade basis through the Bretton Woods system would revitalise America and Europe in largely the same manner, but with far greater effectiveness due to the opening of borders to trade, as Liebig's Law would suggest.

The 1920s in America were therefore partially consistent with the ecological view of society. Through protectionism and other creative trade policies, America was able to augment its carrying capacity to a limited extent, allowing a small, temporary bubble of exuberance to manifest.

The enlightenment is a slightly different era to comprehend, as rather than abstract trade based capacity, the European nation states actually seized land to increase their capacity and bring exuberance. The growth of the British Empire and other European conquests during this period is well known, and in particular led to Britain becoming a global superpower in its own right, strengthened by industrial technologies.

Social philosophers such as John Locke, David Hume and Adam Smith set out the foundations for modern secular states, angered by the superstition, abuse and

intolerance which dominated discourse. Child labour laws and other social policies were implemented during this period, and living standards began to rise.

The Holy Roman Empire became solidified in 1763 by the Treaty of Hubertusburg, and became a major European power. Under the ideal of enlightened absolutism, the state was governed according to the direction of leading philosophers. Economic and territorial growth followed, accompanied by the predictable liberalisation of social policy. Legal reforms were undertaken, including such positives as the abolition of torture and greater equality for Jews. Peasantry were offered increased liberties and compulsory education began to be implemented.

The American war of independence was not able to fully stem this exuberance, but while Britain was able to weather the storm and live through the renowned Victorian era, the limits to imperial growth became apparent, sowing the seeds for what would become a long and bitter decline for the British empire.

France is also an interesting case here, as rather than exuberance resulting from growth, the enlightenment values described by Denis Diderot et al in *Encyclopédie* were instrumental in inspiring the populace to overthrow the monarchy. A revitalised post revolutionary France then proceeded to forge its own exuberant empire through the military prowess of Napoleon Bonaparte.

The vast empires of exuberance which rose up during this period were met with the limits to growth first hand. The great powers squabbled over balance in Europe, with local and colonial territory being high up the list. The peak of exuberance had announced itself, and war, rather than de-growth was the only route forward.

While other important class struggles, political nuances, and clashes of ideology underpin these sprawling periods, the correlations with the concepts of exuberance and carrying capacity are noticeable, and are entirely predictable given our lineage as social primates with complex cultures.

Based upon this exuberant timeline, is it wise to suggest that our current quandary is the final post exuberance, or the end of the line for self directed individualism? There is nothing to suggest that a major technological breakthrough cannot produce another period of socially beneficial exuberant growth. Even today, we can see that giants such as China and India are undergoing ascendant growth under economic reforms. While the human rights

record of China remains questionable, this exuberance seems to have improved the situation immeasurably since the days of Mao Zedong.

However, we must question as to whether this trend can continue forever. If not, then chasing abstract growth will eventually yield no benefit, and will instead enshrine the xenophobic and authoritarian ideals of post-exuberant despair ad nauseum.

Based upon this striking correlation with the animal kingdom, we see that it is oversimplified to extrapolate a broad social trend from one era to another. The post war expansion, and others like it represent different worlds to our own, and we cannot expect what worked then to always work now.

As our conventional market incentive is a pseudo-evolutionary one, it is not valid to point to a period of demonstrable evolutionary exuberance as a rationalisation for its application in the absence of these dynamics. Western post exuberance seems deep rooted and malignant, and it draws shockingly close parallels with societies of our close animal relatives.

We are thusly met with two choices; either to continue to chase growth, however meaningless and abstract it has become, or to re-evaluate our societal order based on reason rather than evolutionary predeterminations. Not upon the reason of enlightened European philosophers, but upon a new economic reason, backed by a comprehensive grasp of real value.

Given the body of evidence presenting the effects of post exuberance on our animal peers, it seems that barking up the same tree in order to rekindle the 1950s will only act to further the gradual decline into authoritarianism, xenophobia and scapegoating. As humans we are armed with robust logic to project our long term collective future in ways that other animals may only dream of. To take such a gift off the table and mindlessly throw ourselves at the whim of ecological principles is lunacy. It is not the end of exuberant growth that is the problem; it is instead the way we are choosing to deal with it.

So can our society be rationalised within a market economy in order to circumvent our primordial addiction to exuberant growth? Or is there a more complex argument to be made? We must first confront the smooth talking cargoists who would have us believe that growth can continue unabated as our markets modernise and become 'knowledge-based' rather than 'product-based'. This flimsy line of argument is tackled presently.

Growth in the Digital Age

The common rejoinder of the market apologist when confronted with the conceptual flaws underlying economic growth, is to abstractly propose that economic growth and resource usage can be 'decoupled' in order to produce an economy which grows without straining the environment. In 2014, the United Nations International Resource Panel published a report which summarised the potential for this line of attack, and the three possible ways in which it could manifest.

1. *"Decoupling through maturation" - This type of decoupling is a "natural" process of overcoming clumsy and inefficient techniques, of building-up of infrastructures, and of actively reducing environmental pollution. This is related to the maturation process as countries shift from an extraction and production-based economy towards a service economy.*

2. *"Decoupling through shifting to other countries the more material intensive stages in product life cycles (burden-shifting)" - If domestic extraction and production is replaced by imported materials and products, resource use may decline domestically, but still occur elsewhere in the world where the more material intensive, often more polluting, stages in products life cycles may be taking place. This type of decoupling is often labelled as burden-shifting, where resource-intensive activities and their environmental impacts are shifted offshore.*

3. *"Decoupling through intentional resource productivity increase" - This is what is really needed to reduce pressures on limited resources, on climate, and on the environment in general. It requires technological innovation, infrastructures conducive to resource efficient and low material intensity manufacturing and living, and appropriate attitudes and consumption patterns.* ^[8]

Keen eyed readers will recognise that these points are all ecologically naive circumstances, which William Catton astutely summarised decades ago. Points 1 and 3 are products of the cargoist mindset, in which improving technology can offset the non-negotiable natural limits to growth, while point 2 is a simple shifting of staves from one economy to another.

But this concept of decoupling economic growth from resource usage remains the primary source of apologetics for the market minded, and has been for some time. As early as 1972, when Dana Meadows published her now renowned tome *Limits to Growth*, a sustained backlash against the author developed, rooted in

cargoism and technological cornucopianism. In a Newsweek article published the same year as *Limits to Growth*, Allen Kneese and Ronald Riker of the think tank, Resources for the Future (RFF) argued that:

"The authors load their case by letting some things grow exponentially and others not. Population, capital and pollution grow exponentially in all models, but technologies for expanding resources and controlling pollution are permitted to grow, if at all, only in discrete increments."^[9]

As we have seen in chapter 1.5, some aspects of technology related to microprocessors have observed trends which are comparable to exponentiality, so this criticism may had some weight in 1972. However, the proof is in the pudding; commodity prices have typically fallen over time, in line with the trends of more efficient technology. As shown in Figure 1.13-3, this trend is now rapidly reversing.

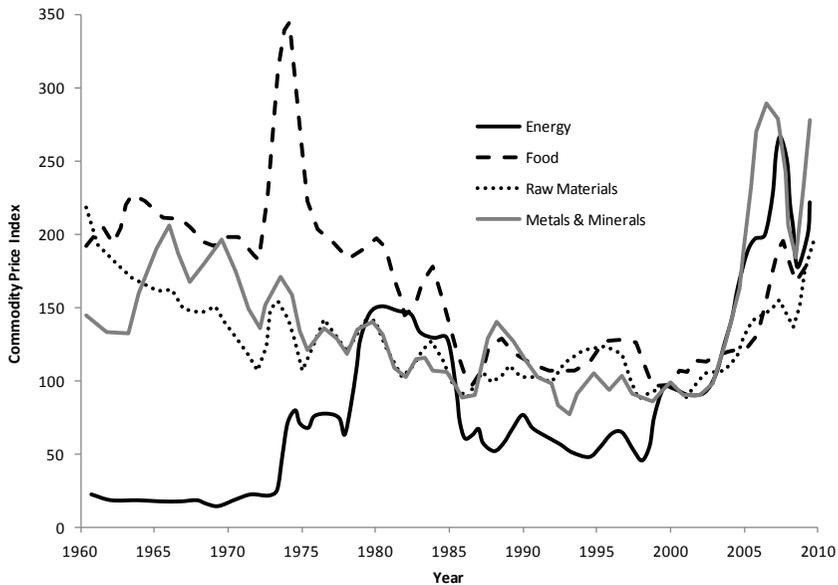


Figure 1.13-3: Commodity prices over time - Adapted by author from [10]

Similarly, perusal of specific material consumption rates on a global scale show similar trends. Figure 1.13-4, Figure 1.13-5 and Figure 1.13-6 show the extraction and production rates of various raw materials from various sources - all are observing consistent upward trends. In the case of Figure 1.13-6, all materials are actually observing an upward *exponential* trend. This is however not news to us, as we have discussed the extent of depletion in chapter 1.11.

What is of pertinence here is that despite political pressure to decouple consumption of resources from economic growth, it is clear that the phenomena remain fundamentally interlinked.

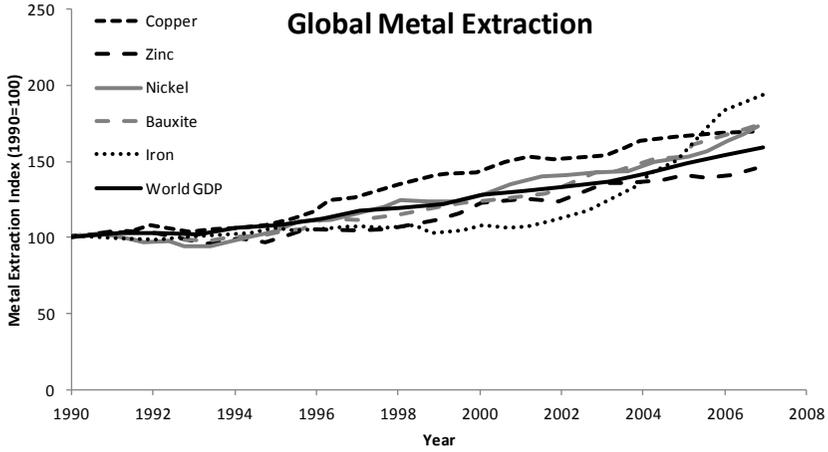


Figure 1.13-4: Global metal extraction in dex - Adapted by author from [11]

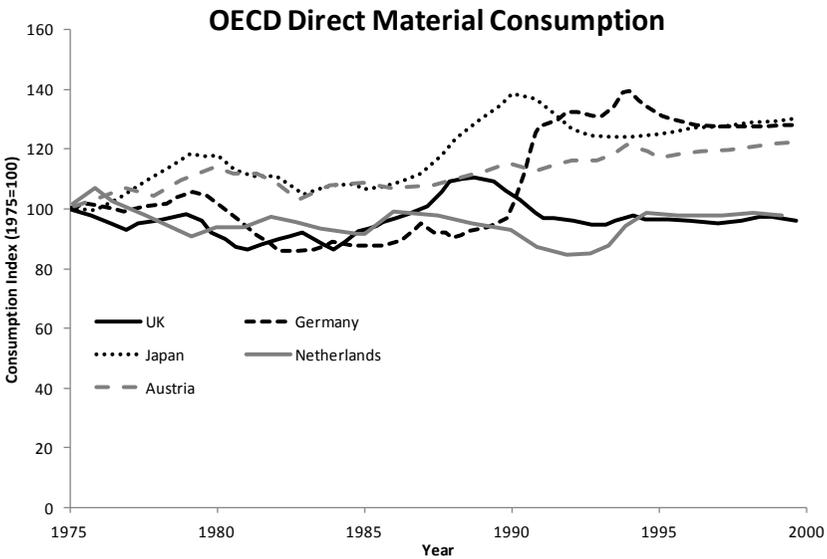


Figure 1.13-5: Raw material consumption in dex - selected OECD nations - Adapted by author from [12]

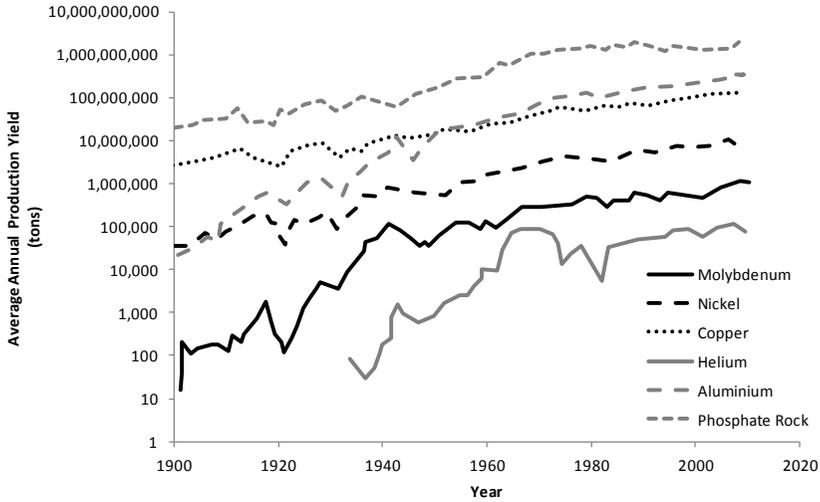


Figure 1.13-6: Global production yields in various raw materials - Note that the vertical axis is logarithmic, indicating exponential growth for all material yields - Adapted by author from [13]

Despite the clear correlations of economic growth and resource throughput, political institutions remain convinced that decoupling is a viable endeavour. A 2008 report issued by OECD as part of the Kobe summit championed the idea of resource productivity, and how increasing the efficiency of resource throughput, while minimising waste would result in a decoupling of economic growth and traditional consumption. The report summarised the mixed results of the developing world as follows:

- *Global extraction of material resources continues to grow, but there are signs of decoupling from global economic growth. G8 countries' resource productivity has been improving, their material intensity decreased by more than 47 % between 1980 and 2008 and their annual per capita material consumption declined from nearly 20 tonnes to less than 18 tonnes. Over the same period, OECD economies have reduced their material intensity by 42% and their per capita consumption declined by 1.5% to 17.6t.*
- *However, the overall level of material consumption has continued to grow in parallel with economic growth, albeit at a slower rate. This means that decoupling has been happening only in relative, rather than absolute, terms. And despite the decline witnessed over the 1980 - 2008 period – a trend partly attributable to the 2008 financial crisis – per*

capita consumption in G8 and OECD countries remains at high levels and is about three times that of the rest of the world.

- *Within the G8, Canada, Germany, Italy and Japan have succeeded in decoupling material consumption from economic growth in absolute terms. Some absolute decoupling has occurred across all G8 countries for certain material groups, such as wood, construction minerals, industrial minerals and metals, the latter experiencing the strongest decoupling^[14]*

So while decoupling has been piecemeal and mixed across the various nations, the report stands by the concept that 'absolute' decoupling, as it phrases it, is a tangible phenomenon. However, the report defeats itself in its own wording, as it still must concede that developed world consumption of resources remains "...about three times that of the rest of the world". Despite its reduction in resource usage, the developed world clearly remains a voracious consumer of the world's raw materials.

The argument for decoupling further unravels when we peruse what the economic growth in the OECD actually looked like over this time of 'decoupling'. This is shown in Figure 1.13-7. It is abundantly clear that despite the OECD still growing in this environment of resource frugality, it is growing significantly more slowly, with a noticeable downward trend.

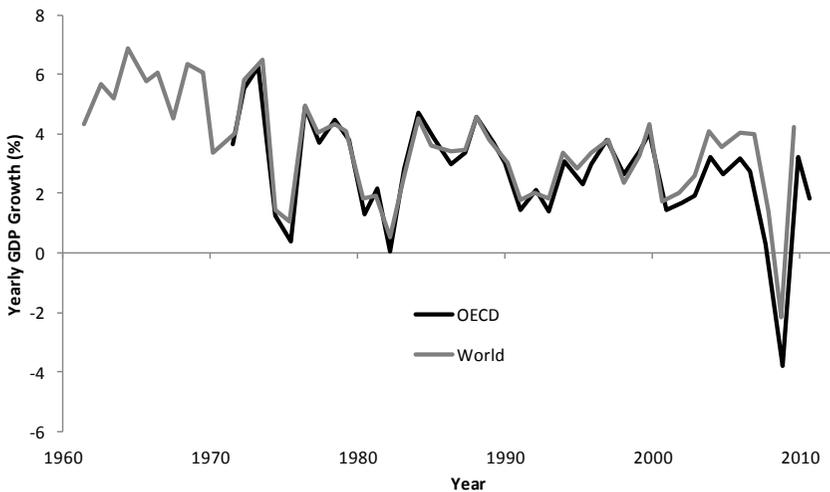


Figure 1.13-7: Growth over period of decoupling - note that OECD growth continues to slow, and generally lags behind the world average - Plotted by author from [15]

So was Meadows right in her heavily criticised *Limits to Growth*? Can growth really decouple itself from the non-negotiable ecological limits to material usage? In 2011, Professor Ugo Bardi published a book-length academic study, revisiting the arguments put forth in *Limits to Growth*. It was found that the 'business as usual' model - the strangely ominous sounding 'World3' - put forth within the original study some 40 years earlier, closely mimicked the trends that were observed in reality^[16]. Bardi went on to examine the reasons why the warnings of Limits to Growth did not gain steam in the public eye.

"In practice, the LTG [Limits to Growth] study was widely misread and misinterpreted. Scenarios were mistaken for prophecies of doom, the need for concerted action was seen as a call for world dictatorship, the plea for equality taken as an attempt to destroy the lifestyle of people living in Western Countries. In addition, the concept that it was necessary to stop polluting activities and slow down economic growth generated strong opposition from powerful industrial and political lobbies."^[17]

This conclusion rings of some truth, but is perhaps somewhat naive in its omission of the fundamental ecology of the human species. We currently exist in an unprecedented period of drawdown-backed exuberance, and as such we are able to steal energy from the future in order to support our lives now. This energy buffer of course means that we are no longer perilously at the whim of famine, pandemic or natural disasters, but it also grants us the ability to exuberantly expand into this untapped energy supply, just like the yeast in the winery vat.

The temporal abundance of fossil fuel energy and other drawdown resources means that all of our social prerogatives and institutions are imbued with this underlying assumption of abundant limitlessness. So yes, while the political and industrial lobbies may campaign to discredit studies critical of growth, and the public may see the lessons of these studies as indicative of coming tyranny or oppression, the blame in actuality lies with the overarching system which has inculcated these views into its institutions, and demands limitlessness in order to function.

But the underlying mechanisms of growth will be discussed later in this chapter. For now, with the concept of economic decoupling looking fairly haggard, we must move swiftly on to the second primary line of growth apologetics. That is, the concept that economic growth has fundamental social positives which are too important to ever let it cease.

The Social Returns of Growth

Not long after the publication of *Limits to Growth*, Yale economist and professor, Henry Wallich, championed a natural end to growth, absent of political or social intervention from beyond the demesne of the market. A true cargoist, Wallich argued for the sanctity of technology, and its ability to solve the problems ahead. However not only did Wallich state that technology required growth in order to continue its ascendancy, he further added that the cessation of growth meant consigning billions to permanent poverty^[18].

The late Wallich is not alone in his fervour for growth, and his faith in its potency for improving the lives of those in poverty. As we have already seen, economic growth is seen as the primary, uncontested vehicle to well-being, and even prime ministers who suggest other measures for well-being are ridiculed.

But does this intrinsic relationship between economic growth and general societal wellbeing actually exist, and can this be an argument for ignoring the hard ecological limits that await us should we continue to grow? The correlation of life expectancy with GDP in various nations is plotted in Figure 1.13-8. What do we see? Initially, there is a strong positive correlation with the size of an economy and the life expectancy of its citizens, but notice that this rises within a very narrow range of GDP, before reaching a plateau before the \$10,000 mark.

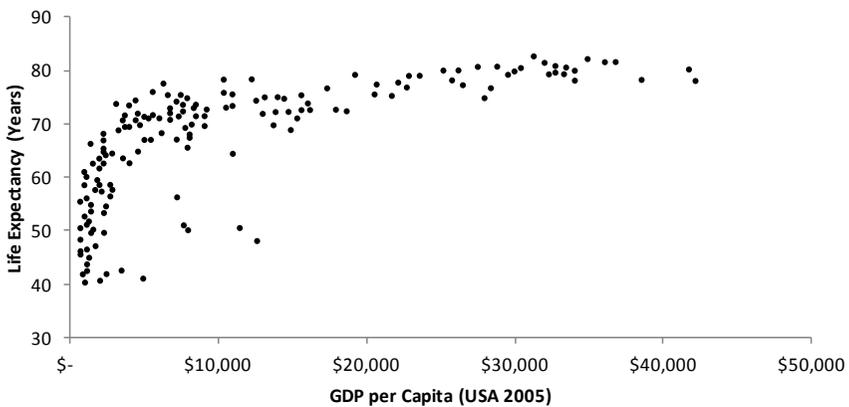


Figure 1.13-8: Per capita GDP versus life expectancy in various nations - Adapted by author from [19]

Despite the developed nations to the right of Figure 1.13-8 possessing GDP per capita beyond \$30,000, these nations observe no significant advantage in terms of life expectancy. Intuitively, this seems to make sense, as once a nation has attained a level of growth which allows a basic standard of living, and a basic

level of healthcare, further growth does not really yield any additional benefit, or yields benefits at rapidly diminishing returns.

This perhaps is a slightly unfair example, as life expectancy is at least bound by certain biological limits. However, perusing other, more fluid social measures of wellbeing yields almost identical results. Figure 1.13-9 shows a similar plot, but this time with the percentage of the population who feel happy and satisfied with their lives against GDP per capita.

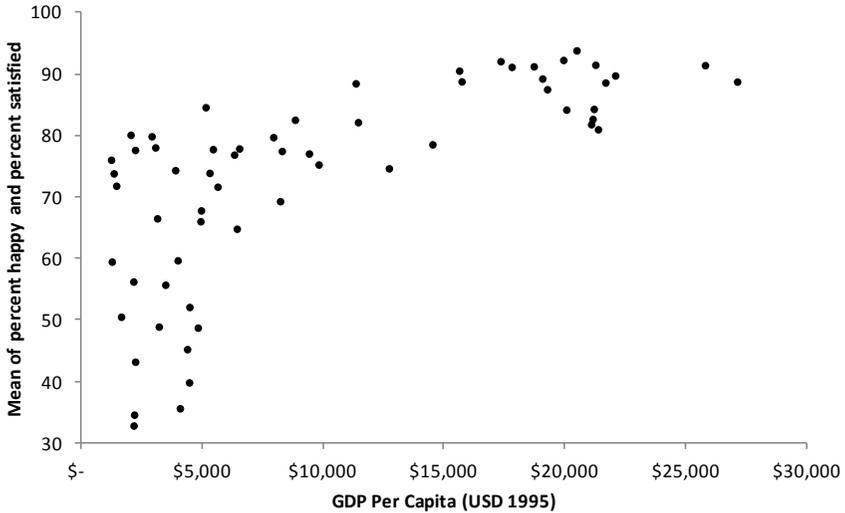


Figure 1.13-9: Per capita GDP versus Social Wellbeing (happiness) - Adapted by author from [20]

This is perhaps somewhat counter-intuitive, as wellbeing and satisfaction would appear to be a social property which theoretically has no limit. There is no hard reasoning as to why up to 100% of a population could not be satisfied with their lives, at least not in the same way that human lifespan is limited by biological factors.

Yet we also see happiness and satisfaction stagnating very quickly with increasing GDP, and then further growth failing to push any population significantly above 80-90%. Additionally, this seems to transcend culture, as even within nations, the same relationship holds true over time. For instance, in the UK, happiness in the general public reached its peak in 1975, and has not changed appreciably since, despite significant economic growth^[21].

This is interesting for two reasons. Firstly, economic arguments abound surrounding the importance of continued growth in order to maximise social welfare, yet the truth of the matter clearly seems to suggest that this is not the case. In an article for Forbes, The Heartland Institute's Peter Ferrara - a Harvard educated economist and lawyer - argued passionately for the importance of economic growth, irrespective of income inequality, due to the technological advances that it has provided for the poor^[22].

The primary flaw in this line of reasoning is immediately apparent for the reasons shown in Figure 1.13-8 and Figure 1.13-9; Ferrara glosses over the diminishing returns which growth provides. However, the deeper problem with Ferrara's argument stems from his misrepresentation of the economic theory surrounding the issue.

To show why this line of argument is irksome, we must begrudgingly consider the neoclassical model of growth; the Solow–Swan model (and its various extensions). This model posits that in the long run, assuming no technological or population growth, the economy eventually reaches a steady, no-growth state. Growth in this model can only continue with increasing the labour population (in which case the economy grows, but the GDP per capita does not), or if technology generates new productivity gains (in which case the economy simply grows by the gradual gains in technology)^[23].

So not only does Ferrara gloss over the fact that growth in mature economies fails to deliver measurable gains in social benefit, he also reverses the causality of the theoretical neoclassical growth model, and claims that growth drives technological progress, rather than technological progress driving growth. This is clearly an erroneous association which paints growth as a panacea for the poor, rather than a supposed side effect of population and technological development. Ferrara, unfortunately, is far from alone in his oversimplified and idealistic view of growth.

But the diminishing returns of growth are interesting for a second reason, and this brings us back to the concept of ecological exuberance. As we have seen, biotic communities gain a great deal when they are permitted to grow on a population basis. However the fact that the manifestation of these benefits seem to stagnate once an economy has attained a certain size underlines the shortcomings of self directed individualism.

In an evolutionary system, driven by the prerogatives of the individual, population growth (within constraints of course) offers a whole host of benefits.

However it potentially also results in strongly detrimental collective irrationalities, in the manners that we have seen. The diminishing returns of growth is not necessarily one such of these irrationalities, but it is an indicator that the aggregation of individual value does not map directly to collective value.

A community of individuals acting to maximise their own profit does not necessarily result in a society that is maximising its collective value. So while individualist prerogatives, both in nature and within our market system, may drive us to maximise individual value, this dynamic can be utterly meaningless at a societal level, despite the strong Darwinist rhetoric that frequently surrounds markets. Arguments from social benefit must therefore be treated as they are; inconsistently applied, and ignorant of the diminishing returns that growth provides.

What Really Drives Growth?

We have already touched upon the force of growth in the public consensus, and how it is perceived to bring with it a panoply of social benefits. However, the actual reason why economies grow still remains relatively shrouded in shadow to the public and the institution alike, which is somewhat strange given its centrality to policy.

The likes of Ferrara, and other corporatists seem to regard growth as almost a conscious decision which a society takes, either through directed policy or burgeoning and unified societal values. Yet as we have seen, the neoclassicist school of economics views growth almost as a case of happenstance, which is driven by population trends and piecemeal technological breakthroughs. What is the truth behind growth, and can it really be squarely levied against the functionality of the market?

One of the most important factors of course is the growth of population. When an economy gains more people, the general trend in economic product is upward. However, despite the long-term correlations between population and economic growth, the specific properties of growth, particularly in the current era, are much more fluid and independent of population than we may think.

A Brookings report in 2002 highlighted that the population growth in various regions of the United States did not correlate well with the economic growth in those same areas, despite the country as a whole seeing a general correlation in the two figures. One of the key talking points in this piece was Florida, which

observed a yearly influx of elderly citizens retiring to its beaches, with "...*the potential to destroy Florida as effectively as would a military campaign.*"^[24]

The impact of an aging population upon an ecosystem is a uniquely human phenomenon, as it is typically rare for an animal in the wild to die of old age - they simply live until they are no longer able to perform the strenuous tasks required to survive. Humankind is different in this rare aspect, as a combination of complex social support systems, and medical technology allows humans to live substantially longer than they would 'naturally' be capable of.

This is one of the underlying reasons between the seeming discrepancy between economic and population growth. While population growth remains a solid indicator of the growing size of an economy, increasingly older generations produce a skew in the data. Retirement and leisure time in old age is not as economically productive as the equivalent time of a younger person, and extreme age often brings with it substantial costs due to degrading health.

However the young do not escape this gradual divorcing of population and economic growth either, as they are disproportionately placed at the whim of our ascendant technology (as discussed in chapter 1.5). Figure 1.13-10 shows how the growth in available jobs in the USA has historically tracked growth in the working age population rather consistently, except for the 2000s, where it is comically mismatched.

Again we have the curse of collective irrationality looking over our shoulder. The progress in technology, and our greater medical capacity to care for our elders has led to a situation where economic growth is no longer as tightly correlated with population as it once was. The self directed, individualistic prerogatives of population growth remain a powerful force which drive economic expansion, but population alone is just one view to peruse in the complex topic of growth.

Where else can we look for other causal factors in the economic growth quandary? The contents of your very own wallet may be a good indicator. As we have seen in chapter 1.4, the creation of currency within public and private banking institutions is convoluted and counter-intuitive. By extending loans to the population en-masse, banks in essence create a scenario where the primary pool of currency in a society is insufficient to cover the debts raised to back it. While this may seem ludicrous at first inspection, the banking institutions are actually well founded in their reasoning behind this approach.

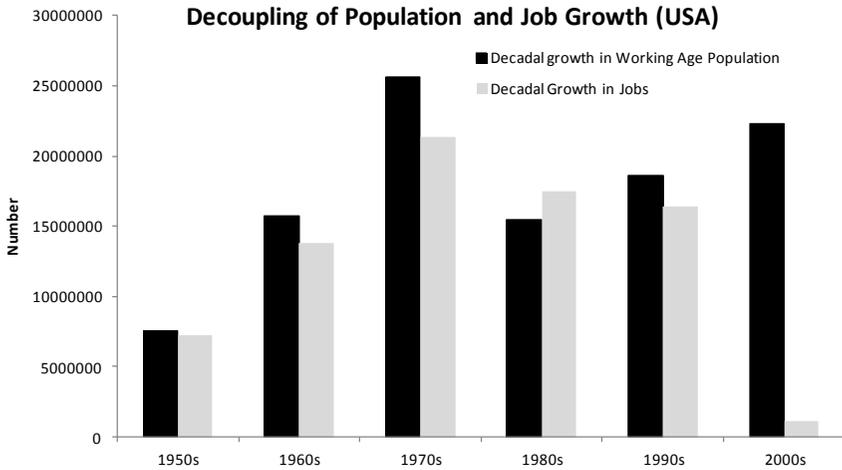


Figure 1.13-10: Working age population growth versus available job growth in the USA - Plotted by author from [25]

Loans are essentially investments, under which a profit can be turned in the longer term. Macroeconomically, the collective banking sector loans currency into society in order to support its development, in the hope that this development will yield returns in the long run. In a similar manner, governments loan currency into their economies backed by the sale of bonds, which are expected to mature to a higher value than the initial loan.

This nested array of loans upon loans is contingent upon one thing; growth of the economy, such that it is worth more tomorrow than it is today, and thus able to give returns to the investors in due course. As we have seen, societies throughout history have operated on similar prerogatives. Issues arise when growth within the economy does not meet the collective expectations of the investors, historically, resulting in debt collapse or debt jubilee.

The relationship with self directed investment within a society and the growth of economy is therefore fundamental. The environment of expectation amongst societal investors, as expressed by the constant extension of loans into the money supply, creates a scenario where steady state business is sidelined at the behest of growth business. Similarly, within growth businesses, those that grow with greater momentum are inherently more valuable to the investor.

Macroeconomically, this aggregates to a scenario where the economy as a whole is forced to grow in order to satisfy debt obligations to its investors. This is a powerful facet within the complex phenomenon of economic growth, but is it

really inherent to the market? Could a marketplace function instead as a steady state economy?

As it stands, the answer is unclear. The financial pressure for businesses and economies to grow partially extends from the inadequacy of our currencies to properly account value (as discussed in chapter 1.12). With the overwhelming majority of our currency pool backed by debt, money becomes nothing more than a token issued on behalf of an investor, expectant of a return.

This at its most basal level is individualistic market incentive, literally monetised into the currency which we exchange. Utilising this currency in a steady state economy is therefore impossible by its very definition, and this is so clearly evident by the financial misery that ensues when economies fail to grow.

Should monetary reform occur, and currencies take on a new and exciting role in society, then this discussion changes immediately, as currency could be redesigned in order to prevent individualistic speculation upon future trends. However this action would require a significant gutting of the financial sector as a whole, and the introduction of new, much more stringent regulations upon the interaction of money. Such an outcome cannot realistically be labelled as a market solution, as it would be an encroachment upon individualist, for-profit banking, and would be unrecognisable from any economy known in history.

Needless to say, the current phenomenon of growth is fundamentally tied to the market system, and its convoluted, chaotic process of endogenous money creation. But this conclusion is not a new one, nor has it silently remained on the sidelines. Michael Rowbotham, who's work on monetary reform we perused in chapter 1.4, wrote strongly about the intermeshing of inflation, debt and economic growth in his work throughout the 1990s^[26]. This is not to mention the efforts of economic Professor Herman Daly, perhaps the most vocal and renowned critic of growth since his scathing public resignation from the World Bank in 1994*, and publication of his masterwork *Beyond Growth* in 1997.

Daly argued that global banking institutions like the World Bank, were so ingrained with their market-centric monetary and social policies that *"...rather than redemption of the World Bank, I think it's probably time to have a model of death and resurrection... Kill them off and start over again with something new."*^[28] I would however argue that it is not the World Bank alone which

* During his resignation speech, Daly suggested that his former World Bank colleagues should get some "new glasses and a hearing aid" to aid them in dealing with the outside world - see [27].

champions growth at all costs, it is rather the aggregation of individualist actors within a complex world. To kill off the institutions would be an easy task in this regard; the actual challenge is to supersede the market incentive structure itself, a task which is much, much more difficult.

Conclusions

As we reach the end of our 'reasons to change' portion of the book, the sheer interconnectivity of human society becomes all too apparent. Growth is perhaps one of the most complex of these concepts, as it has its root in ecological exuberance, employment, debt, and so many other facets that we have assessed. As such, it is difficult to fully assess the market's role in driving unsustainable or unnecessary growth.

What we therefore can only conclude, is that unwarranted and harmful growth is macroscopic phenomenon which is driven by an aggregated individualist prerogative. It is in the evolutionary diktat of the organism to reproduce and pass on its genes, as it is also the financial impetus of the bank to extend loans in order to generate revenue. These prerogatives, and the others that we have assessed are the hallmarks of individualist incentive structures, and they inevitably drive phenomena which are chaotic and collectively irrational.

Reaching further back to chapter 1.9, we saw this dynamic metaphorically interpreted in Dawkins' forest, in which the trees are condemned to grow to inefficient and unwieldy heights due to the basal individualism of evolution by natural selection. Growth of our human ecosystem is no different to the parable behind this forest, with the exception that our basal evolutionary instincts are bolstered by our pseudo-evolutionary socioeconomic model.

The marketplace may therefore both be viewed as an extension of our biological prerogatives, as well as an exacerbator of those very same genetic predispositions. That is ultimately the broadest and most rational view that we can hold, as the chaotic and unpredictable relationships between culture and evolutionary genetics are currently beyond our capacity to quantify. Needless to say, the reasoning for a shift away from our individualist biological imperatives, and the market system which mimics and enshrines them is clear. The next chapter will offer a brief recap and summary of the discussion so far.

Chapter 1.13- References and Notes

- [1]. Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD*,
http://www.ggdc.net/maddison/Historical_Statistics/horizontal-file_03-2007.xls, cross plotted against CO₂ data from; Forster, P., V. Ramaswamy, P. Artaxo, T. Berntsen, R. Betts, D.W. Fahey, J. Haywood, J. Lean, D.C. Lowe, G. Myhre, J. Nganga, R. Prinn, G. Raga, M. Schulz and R. Van Dorland, 2007: *Changes in Atmospheric Constituents and in Radiative Forcing*. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA
- [2]. Abolqasem Ferdowsi, *The Shahnameh: The Persian Book of Kings*, Penguin Classics; Deluxe edition, 2007
- [3]. Ivo Šlaus, *Human Capital: Its Self-Augmenting Growth & Individuality - A Simple, Possibly Naïve Approach*, World Academy of Art & Science, Eruditio, Issue 1 - Part 1, June 2012
- [4]. William R. Catton, Jr., *Overshoot, the Ecological Basis of Revolutionary Change*, University of Illinois Press; (1 Jun. 1982), pg138
- [5]. John B. Calhoun, *Population Density and Social Pathology*, Calif Med. 1970 Nov; 113(5): 54.
- [6]. *European Election 2009: UK Results*, BBC News. 8 June 2009
- [7]. Lucy Moore, *Anything Goes: A Biography of the Roaring Twenties*, Atlantic Books (1 Sept. 2009)
- [8]. UNEP (2014) *Decoupling 2 : technologies, opportunities and policy options . A Report of the Working Group on Decoupling to the International Resource Panel*, pg5
- [9]. *To Grow or Not to Grow*, Newsweek, March 13, 1972, pp102-03 (RFF)
- [10]. UNEP (2014) *Decoupling 2 : technologies, opportunities and policy options . A Report of the Working Group on Decoupling to the International Resource Panel*, pg3
- [11]. Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet*, Earthscan, 2009, pg74
- [12]. *Ibid*, pg72

- [13]. UNEP (2014) *Decoupling 2 : technologies, opportunities and policy options . A Report of the Working Group on Decoupling to the International Resource Panel*, pg2
- [14]. *Resource Productivity in the G8 and the OECD: A Report in the Framework of the Kobe 3R Action Plan*, OECD, 2008. pg5
- [15]. Data taken from World Bank Group and OECD
- [16]. Ugo Bardi, *The Limits to Growth Revisited*, Springer, 2011
- [17]. *Ibid*
- [18]. Alan AtKisson, *Believing Cassandra: An Optimist Looks at a Pessimist's World*, Chelsea Green (September 1, 1999)
- [19]. Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet*, Earthscan, 2009, pg56
- [20]. *Ibid*, pg42
- [21]. *Chasing Progress - Beyond measuring economic growth: The power of well-being*, New Economics Foundation, 2004, pg3
- [22]. Peter Ferrari, *Why Economic Growth Is Exponentially More Important Than Income Inequality*, Forbes, 14 Jan 2014 - <http://www.forbes.com/sites/peterferrara/2014/01/14/why-economic-growth-is-exponentially-more-important-than-income-inequality/>
- [23]. Steve Keen, *Debunking Economics*, Zed Books Ltd, 2011, pp256-257
- [24]. Paul D. Gottlieb, *Growth Without Growth : An Alternative Economic Development Goal For Metropolitan Areas*, The Brookings Institution Center on Urban and Metropolitan Policy, February 2002, pg1
- [25]. Data taken from Bureau of Labor Statistics (BLS) - <http://www.bls.gov/ces/> - "Employment Levels" as compared to the BLS Civilian noninstitutional "Population", "Growth in Employment" and "Growth in Population" respectively
- [26]. Michael Rowbotham, *The Grip of Death: A Study of Modern Money, Debt Slavery and Destructive Economics*, Jon Carpenter, 1998
- [27]. Lissa Harris, *The economic heresy of Herman Daly*, Grist, 10 Apr 2003 - <http://grist.org/article/bank/>
- [28]. *Ibid*

1.14 Conclusions: The Ramifications of Inaction

REACHING THE END of this section of the book, we can now accurately summarise the effects of the market paradigm upon human society, and come to some roundabout answer to the question we initially proposed: *“Is the current social system the most beneficial model for humanity?”*

What is of clear importance here is that the current market based socioeconomic system is in fact not truly a system of our own theoretical concoction, but instead a broader expression of our own evolutionary individualism. This seems fairly obvious, given the inclinations for free-market proponents to describe the system as 'natural', and the evolutionary rhetoric which so often surrounds discussion of the market (e.g. survival of the fittest, the importance of competition etc.)

This is however beside the point, as the question still stands, is the system beneficial? Again, we must avoid the soapbox in this field of discussion if we are to truly get to the root of human society, so I am not going to proselytise an politically anti-market worldview. Our global society clearly bears multiple hallmarks of a species in the throes of overshoot, and the technological comucopianism which is so often assumed to thwart this correlation does not seem to hold a great deal of water.

I, for one, envisage a human race that does not collapse under the bloated strain of its own exuberant growth. I see humanity as a species with great potential, and with the capacity to create a complex civilisation that may last for millennia into the future. The prospect of our global society being condemned to the same fate as yeast in a winery vat is therefore rather irksome to me, although I appreciate that others may not share this view.

I am fully aware that many people indeed see society as a sum of individuals, and would not shed a tear over its collapse so long as their own prosperity was

safeguarded for their remaining days. However, we must stick to the question at hand, and the answer to this is quite clear; the pseudo-evolutionary system of markets is not beneficial to what we may perceive as human society. The following subsection summarises why.

The Exponential Precipice

Figure 1.14-1 shows a collection of trends within human society and the wider environment. What is patently clear is that we have a snapshot of a species who are ascending the ever steepening curve of overshoot. What is of special curiosity here is that only some of these trends are directly attributable to our exuberant explosion.

What we are also seeing alongside this is that our cultural phenomena, which are not rooted in nature and are wholly man made, are also reacting in tandem. Our money supplies and our models of economic growth are similarly exponential. This is entirely indicative of the pseudo-evolutionary nature of the market system; it is directly representative of our ecological circumstance.

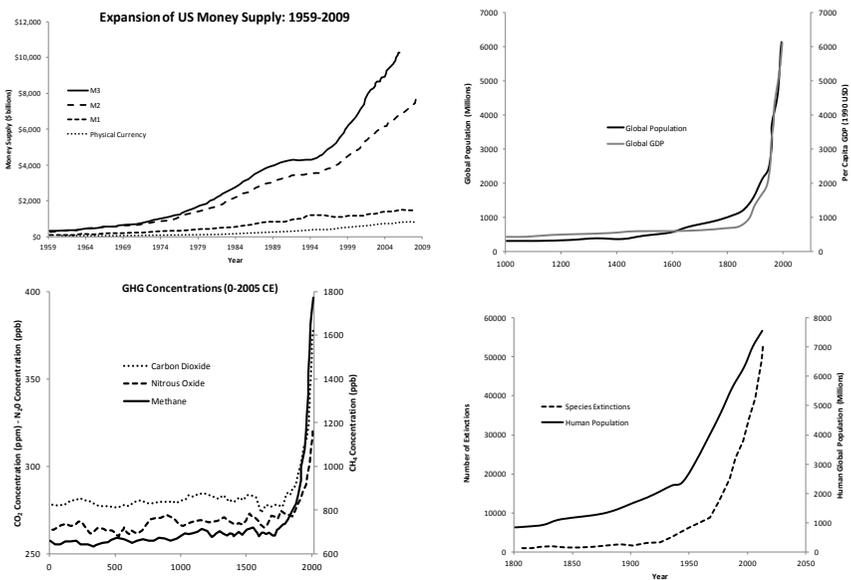


Figure 1.14-1: Various exponential trends within human civilisation - Taken from the preceding chapters

Our precipice may be readily predictable from rudimentary ecology, but our complex society as we approach the apex is fascinating. In the broadest possible sense, we are witnessing what is a fundamental clash between two axioms of our

humanity. On the one side, we have the crude but rugged Darwinian rigor which has dragged us through the Neolithic to our current pedestal atop the world. This facet of our being is staunchly traditional, individualistic and largely unrecognisable from the vast majority of other animals. It acts with evolutionary impetuosity, favouring the here-and-now and caring little for the future.

On the other side, we have a more inquisitive, curious and rational creature. This character finds its home in the study of logic, science and reason, and seeks to do whatever aligns with these ideals. Long term and collective values are to be found here, which in themselves are useless gestures from an evolutionary standpoint, but hold far greater relevance as we hurtle beyond where evolution can take us.

What is especially interesting is that this evolutionary versus evolutionarily novel dichotomy is echoed within the political spectrum, a device which is entirely man made. While our culture may not seem to be grounded within reality at times, viewing the human species from an ecological standpoint presents parallels which are fascinating. The right is traditional and individualistic, and enshrines the powerful forces of evolutionary rigor; the left is collectivist and progressive, and attempts to escape these associations through piecemeal policy. It is clear that in order to weather this coming storm, both ideologies must make concessions.

Ecological reality has dealt us a hand, and based upon the findings of this section, business as usual does not seem to be an option. We must align with whatever environment we are presented with in order to adapt, and the path of our adaptation now lies beyond the realm of what self directed evolutionary theory seems to be able to offer.

Projections for a Business-as-Usual-Approach

As Donella Meadows, lead author of *Limits to Growth* eloquently put, an accurate, time-based model of the future is more difficult than merely predicting that events will happen:

"The difference between the various degrees of "prediction" might be best illustrated by a simple example. If you throw a ball straight up into the air, you can predict with certainty what its general behavior will be. It will rise with decreasing velocity, then reverse direction and fall down with increasing velocity until it hits the ground. You know that it will not continue rising forever, nor begin to orbit the earth, nor loop

three times before landing. It is this sort of elemental understanding of behavior modes that we are seeking with the present world model."^[1]

Thus, when overshoot will begin to fully manifest itself is largely unknown, and rather unpredictable. What we do know is that the graphs shown in Figure 1.14-1 cannot continue rising forever - they have to come down at some point.

The ecological circumstances of business as usual in our market based socioeconomic model are however not the only concern. The mimicry of these basic ecological trends through our individualist market system have also been studied within computer models. Safa Motesharrei of the National Socio-Environmental Synthesis Center in the USA presented a paper in 2014 into the potential collapse of modern industrial civilisation. The paper states:

"The fall of the Roman Empire, and the equally (if not more) advanced Han, Mauryan, and Gupta Empires, as well as so many advanced Mesopotamian Empires, are all testimony to the fact that advanced, sophisticated, complex, and creative civilizations can be both fragile and impermanent,"^[2]

The authors identified two primary factors that contributed to the collapse of every civilization studied. The first of which, as already mentioned is *"The stretching of resources due to the strain placed on the ecological carrying capacity."*^[2] The second is a wholly market driven circumstance; *"The economic stratification of society into Elites and Masses (or "Commoners")"*^[2] This analysis rings true with our own assessment of technology and labour, inequality and cyclical consumption.

However science has become even more strident in voicing its dire omens for the future of society. At the 2012 Fall Meeting of the American Geophysical Union, an otherwise buttoned down affair, a complex systems researcher named Brad Werner delivered his provocatively titled presentation, *"Is Earth F**ked? Dynamical Futility of Global Environmental Management and Possibilities for Sustainability via Direct Action Activism"*^[3]

In this presentation, Werner came to many of the same conclusions that we have arrived at; the dangers of resource shortage, chaotic systems, and unconstrained economic growth. However, uncharacteristically for a purely scientific conference, Werner began to actually endorse political *"resistance"* to the system, as a tool to lessen the effects of the phenomena he described. Werner suggested that groups of people should *"adopt a certain set of dynamics that*

does not fit within the capitalist culture”, including “environmental direct action, resistance taken from outside the dominant culture, as in protests, blockades and sabotage by indigenous peoples, workers, anarchists and other activist groups.”^[3]

When advanced system theorists at geophysical conferences are urging the public to revolt against the market system, the dangers of our current path should be apparent. However the hallways of academia have been positively screaming about the folly of our path for decades. In 1988, anthropologist Joseph Tainter published his definitive work, *The Collapse of Complex Societies*, within which, he criticised the historical view that once great civilisations fell due to unforeseen foreign invasions, crop failures or epidemics of disease

Instead, Tainter argued that the ultimate cause of social collapse is economic, inherent in the structure of human society rather than the result of external shocks. This inherent flaw he argued was due to the diminishing returns on investments in social complexity^[4].

As we have assessed in the previous chapter, economic growth initially leads to prosperity and exuberance, but as it matures, this growth creates additional collectively irrational problems by its very own nature (increased resource throughput, increased population strains, larger loads upon infrastructure, etc.). As we have seen, this chaotic quandary results in diminishing returns in everything from societal happiness to the general affordability of goods and services.

Tainter went on to illustrate that modern statistics also, unsurprisingly, show that marginal returns on investments in energy, education and technological innovation are diminishing today, just as they were in our ancient counterparts prior to their collapse^[4]. Just like these past civilisations, we too are investing increasingly large amounts of energy into complex bureaucracy, institutions and infrastructure in order to deal with the problems caused by our ineffective society.

Yet Tainter's book is now nearly 30 years old, and despite the warning signs being apparent in the late 1980s, the modern global paradigm marches onward, somehow steadfast in its beliefs that the markets of today are somehow impervious to ecological phenomena. It is abundantly clear from numerous perspectives that this blinkered view is invalid, rooted in chronocentrism and exceptionalism. Economists and politicians who champion the marketplace as

the vehicle to a long-lasting human prosperity must realise that sizeable swathes of the historic and scientific community are sternly in disagreement with them, and have been for some time.

Top Level Assessment

The culmination of this chapter allows an interesting perusal of our current market paradigm from a macroscopic vantage point. Calling upon the four overarching categories of civilisation laid out at the beginning of the section (and included in Figure 1.14-2 for completeness), we can now examine the ramifications of market activity in each area, as concluded upon through the preceding chapters.

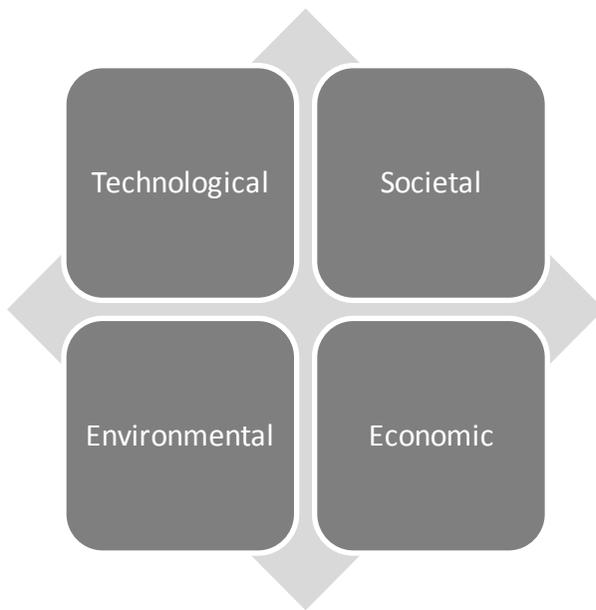


Figure 1.14-2 - Analytical division of civilisation

Starting with the technological aspect of human civilisation, we must decide whether the evidence presented aligns with a world which fosters and exploits technological progress to its fullest. A Schumpeterian worldview may attest to the efficiency of the market in selecting the most technically advanced products through creative destruction, but as we have seen in chapter 1.2, this pseudo-evolutionary process selects technologies which are best aligned with consumption capacity, not necessarily real world value. This consumption oriented progression directly discourages technologies which have enormous real value potential.

This process also inclines production of goods to tend towards shorter lifespans than may be possible, a process which makes little to no sense outside of a cyclically consuming market incentive system. Creating something which is technically inferior to what is possible is the bedrock principle of planned obsolescence, and it cannot be justified in any way from a strictly technical standpoint, only within the bizarre logic of the consumer society.

The requirement for waged labour in order for the consumer society to remain afloat also hinders our capacity to automate. While the market strives for labour efficiency, and directly encourages automation wherever cost efficient, the encroachment of technology is intrinsically at odds with the basis of our economy. This raises a conundrum in which we may only progress our capacity for automation to the detriment of our labour market, or forcefully maintain the axiom of waged labour while squandering the benefits of our technology.

Due to the short sightedness of the market incentive, and the spectrum of opportunities which automation brings to businesses, it seems that something similar to the former of these scenarios will likely play out. So while our system may foster automation to a certain degree, it may only do so by clashing with the inherent principles of employment itself, which cannot really be described as a positive application of technology.

The ramifications of the overarching market based value systems must also be assessed with regard to our societal structure, and the types of interpersonal relations which it fosters. The effect of inequality upon our ability to relate to one another remains a worrying concern, and its links to violence and other social ills are fairly well documented and conclusive. This leaves us with the obvious requirement for some compromise between market dynamics and equality. However, even strident libertarian thinkers struggle to conceptualise a market where true equality of opportunity actually exists.

The pseudo-evolutionary market incentive demands pseudo-ecological growth in order to deliver exuberance. While our culture may benefit from greater mutuality, peace and progress during times of exuberance, society under post-exuberant conditions encourages us to be bitter, xenophobic and authoritarian. For a world to remain in the best possible health, continual mock-ecological growth is required, but our planet is too painfully finite for this to remain reality. As such, our growth based system will at best deliver ebbs and flows of joy and malaise, and at worst throw our world into the abyss of ecological overshoot.

This brings us neatly to the third criterion; the effect of our social model upon the environmental health of our species and the planet. As alluded to, the centrality of growth to the market system, and its complex relationship with ecological overshoot is a pressing concern for long term sustainability. Growth correlates strongly with depletion of finite resources, pollution of the environment, climate change and rates of species extinction. It is indeed difficult to assess how the market system in any way benefits the environment, as conservation remains a reserve of the non-profit, the charity and the philanthropist.

The final pillar is economic, and we can approach this from multiple angles. Firstly, it is clear in the sense of the root of the word that society is not economical. Globalised industry, driven by the prerogatives of profit and growth, requires the wasteful transportation of resources to access new marketplaces all over the world. This lack of efficiency is further exacerbated by the concept of competition, in which we duplicate production infrastructure and products ad nauseum.

A second interpretation is through the actual vessel of finance and currency, which admittedly has helped many out of lives of poverty or subsistence. However the sheer instability of our economic system, and its multi-level misrepresentations of value are profoundly damaging in many regards. Furthermore, the sheer complexity and size of the economy above and beyond the real resources and goods that sustain us is indicative of its superfluity.

It is clear given the immensity of the evidence we have waded through, that the market system is not beneficial to human civilisation in its current form. However do not take my word for it. The conclusions reached in this chapter are generally echoed in the wider academic world. In 2012, the World Economic Forum produced a report which echoes many dire warnings similar to the discussion above. What is especially interesting is that they also divided human civilisation into categories similar to our own (technological, economic, environmental, societal and geopolitical) and assessed the coming risks on a 'business-as-usual' path ahead. These are plotted on Figure 1.14-3.

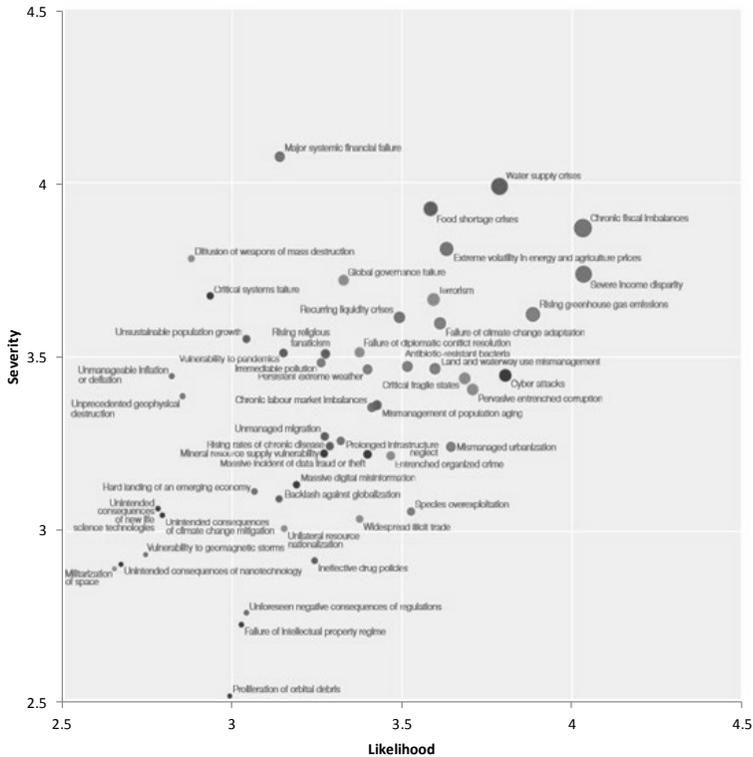


Figure 1.14-3: World Economic Forum Risk matrix - Adapted by author from [5]

As can be seen in Figure 1.14-3, many of the high-likelihood, high impact risks are similar to those that we have pointed out already. A collection of which are food shortage, water crisis, chronic fiscal imbalances, rising greenhouse gas emissions, volatility in energy and agriculture prices and severe income disparity.

This is no longer a distant problem, and the increasing weight of academia behind a shift away from traditional market capitalism is telling of the imperativeness of the issues. It is hoped that at the end of this section of the book, the reader largely agrees that the market system as we know it is unsuitable as a vessel through our uncertain future, and certainly unsuitable as a vessel to long term prosperity. The next section of the book will therefore tackle the difficult question as to what kind of socioeconomic model can we realistically put our trust in to supersede the marketplace and attempt to journey into the future as a prosperous and peaceful global human society.

Chapter 1.14 - References and Notes

- [1]. D. H. Meadows, (1972). *The Limits to Growth*. London: Earth Island Ltd
- [2]. Safa Motesharrei, Jorge Rivas, Eugenia Kalnay, *Human and nature dynamics (HANDY): Modeling inequality and use of resources in the collapse or sustainability of societies*, Ecological Economics, Volume 101, May 2014, Pages 90–102
- [3]. Naomi Klein, *How science is telling us all to revolt*, New Statesman, 29 October, 2013 - <http://www.newstatesman.com/2013/10/science-says-revolt?>
- [4]. Joseph Tainter, *The Collapse of Complex Societies (New Studies in Archaeology)*, Cambridge University Press; New Ed edition, 29 Mar. 1990
- [5]. *Global Risks 2012: Seventh Edition*, World Economic Forum, pg6

Part Two: Direction

IF THERE IS ANY WORD that is thrown around more than it may merit in the thought experiments of social philosophy, it is the word: utopia. The ineffable beauty and perfection of this concept would both inspire and haunt social thinkers long after the ancient Greek language fell from use.

Perhaps obtusely, the modern usage of the word seems to gravitate away from the perfect ideals of Plato and More, and further towards the end of the spectrum associated with ridicule or dismissal. Utopia's perfection renders it unobtainable. While this may certainly be true of the concept, a more complacent and damaging interpretation of this statement arises from Utopia's ashes. If perfection is impossible, then why bother changing anything?

It is this broad line of reasoning that is so often peddled to defend the warts-and-all market from criticism. While the market may be an imperfect medium for prosperity, it is the best that the imperfect human race can manage. Any attempt to improve upon the market system is therefore doe-eyed idealism, or the ramblings of a naive utopian. Right?

As the first section of the book has fairly conclusively shown, the market stands as more than an 'imperfect' medium. It is demonstrable that much is amiss within our socioeconomic system, and real threats of collapse loom on the horizon.

Is it farfetched perfectionism to seek a system which is more robust and stable? Is it naïveté to suggest greater fairness, economic freedom, equality of opportunity and education for a far larger portion of the global society? Most soberly, is it a utopian ideal to seek a society which is not racing towards ecological catastrophe due to a short sighted growth model? Certainly not, and these are precisely the outcomes which our current socioeconomic order is at the very least indirectly responsible for.

In the coming section, a fundamental approach will be outlined in order to define what kind of path we should select to begin the difficult journey through the end of oil, the explosion of population and the obsolescence of economic growth. The coming centuries will undoubtedly be our greatest test as an advanced

civilisation, and their outcomes will largely be decided by the integrity and flexibility of the new course we plot.

However, proposals and plans are nothing without study to back them up. Before humanity places its first step off the well trodden path of historical precedent, we must assess what awaits us in the dense wilderness beyond. We must rationally and logically consider the implications of our new direction, rather than continuing to pay for the knee jerk reactions and opinionated short-sightedness which have brought us to this quandary.

The following section of the book is therefore not only a proposal for change, but also a pre-emptive rebuke to common misconceptions or criticisms which naturally emanate from the taboo discussion of societal change. Empirical, scientific study must be favoured over preconceived notions of what humanity is or isn't, and what humanity can and can't do

2.1 The Path to a Post Market Age

IT IS NEEDLESS TO SAY that a medical philosophy which attacks solely the symptoms of illness is not adequate medicine at all. To target superficial manifestations of a deeper problem is to commit to a long term struggle to repress the illness, rather than cure it. In the best case, this is simply an inefficient way of dealing with a problem, as the symptoms will continue to recur; in the worst case, it undermines health and integrity, while masking clues to degradation.

It is therefore strange how different disciplines of human knowledge seem to approach matters in almost total isolation from one another, with methods which would seem idiotic to one another. To a doctor, it would be only the most temporary and desperate of approaches to attack the symptoms alone, and the approach would be employed only in the hope of finding the correct treatment for the underlying problem. A politician on the other hand, facing a rise in crime rate would no doubt respond with measures like more CCTV investment, or officers on the beat in the area. Perhaps a review of the law to be tougher on offenders would accompany these changes as well.

All of the above would be seen as normal or obvious to a member of the electorate, yet a psychologist looking at the same crime problem would come to a different conclusion. As we have seen, they may argue that the violence witnessed is correlated strongly with deeper social ills, rooted in the abusive, shameful or negative upbringing of the perpetrators. A sociologist or epidemiologist elsewhere may discover that the prevalence of consumerism, socio-economic stresses and levels of personal debt strongly affect the mental health and stress levels of individuals, leading to poorer social cohesion and interpersonal relationships.

Yet all of these conclusions, despite all being valid in some regard, will be reached in isolation from one another. It seems obvious to suggest that the links between these phenomena should be fully accounted for, and our approach

should be to combat them on a macroscopic level. Yet despite this, our social policy continues to put plasters on society's sores, while doing little or nothing to cure what generates them.

Elsewhere, we see the inadequacy of an abstract, debt based finance system tearing apart livelihoods and causing global hardship. Yet we do not dare to toy with the idea of reforming the way money mechanics function; we instead inanely fiddle with patchwork legislation to manage our ailing behemoth. We see mines steadily being stripped bare of precious materials, while a landfill on the other side of the globe becomes positively bloated with them. Yet our answer to these issues is not to slow down production and attempt to conserve such finite resources; it is instead to endlessly accelerate it in order to bring growth and faux-prosperity.

It is plainly obvious that the source of our plight does not lie in the bloodied and beaten symptoms of our broken social model. Prosperity no longer lies in the pantheons of Carl Sagan's chauvinistic nationalism, or racialism^[1]; in the narrow worldviews of religious clerics or the prima facie truths of usury based economy and commerce.

Conversely our woes do not lie in the waves of crime and undue violence; the terrorists and their fascistic agenda, the 'evil' bankers, or the 'corrupt' politicians in senate houses and parliaments. Our misdirection lies in the outgrowth of an antiquated, market-centric socio-economic system, and its accompanying collection of baseless and unfounded worldviews. It is plain to see from our assessment in part one that we have reached the end of the road for the pseudo-evolutionary social model.

It is patently clear that this manner of conduct must be buried, and a radically new paradigm must enter the fray, but what form will this new paradigm take? This chapter is an attempt to approach this difficult question, and to do so with a mind unencumbered by ideology, dogma or commonly perceived truth.

The Aim

Initially, it is wise to lay out exactly what we want a socioeconomic system to accomplish. This is in fact a relatively easy question to answer, as our current model already attempts to deliver these goals through its warped logic. The purpose should really be quite simple; to maximise the quality of life for each individual human being, both those alive now, and those who will live far off into the future.

Now, I can hear alarm bells ringing straight away from such a statement. Surely individualism and hedonism are at least partly responsible for the quandary that we find ourselves in? Indeed, the attempt to optimise human wellbeing through the individualist market mechanism is just what has led us to so many collective irrationalities in our environment and economy. However, what we must forever bear in mind when moving forward is that the pseudo-evolutionary brand of individualism which fuels modern market systems is not a true optimisation.

As we have seen, the super rich are just as mentally prone to the social stresses of competition as the middling and poor, despite purchasing power which extends far beyond their actual needs. Furthermore, the damaging environmental effects of sustained high levels of consumption are to be reaped by us all, not just those who are at the bottom of the ladder.

What we must instead talk about here is individualism from a macroscopic standpoint; an optimised form of individual well-being which does not aggrandise ever rising consumption. We must recognise the true sociological, physiological and psychological roots of human wellbeing, and enshrine these within the fabric of the social model. Furthermore, we must optimise this model such that these needs are met for the absolute maximum amount of human beings possible.

Therefore optimising individual human wellbeing becomes a complex function of optimising collective wellbeing. In other words, we must seek to deliver the maximum absolute value to each individual human, not the maximum relative value.

But what would this optimisation look like? Would a majority of humans be forced to live more meagre lives than they do now, in order to curb resource depletion? Would striking the balance between individual and collective wellbeing result in a reduction in life quality? In order to answer these questions, we need a mechanism by which to measure potential changes; a tool which acts in the way that economic theory does today.

The Methodology

The political landscape is one which has served mankind for many years, and it is one which still commands praise despite all its foibles. The democratic process is at least superficially fair, and allows for a degree of social participation in a nation's governance. However, as we have seen, this process is not conducive of actually obtaining the truth of the matter. The nature of democracy is readily corruptible by the quality of information fed to the

electorate, and even in the absence of disinformation, democracy is merely a reflection of aggregated beliefs, not reality. As such, for all its benefits, it simply must be retired from the heavy lifting of running a society.

But what methodology can arise to replace this ancient titan? Many social models have been proposed which present alternative approaches, but of the few that have been enacted, most are observed to collapse inexorably into dictatorship.

What we must be sure of, is that the global socioeconomic system is a technical creation. It is in most regards the largest and most technical creation in human history; a system so complex that mathematicians of old completely failed in their attempts to model it in any meaningful sense. It is partly for this reason that the philosophical ideals of the political left and right emerged, along with the various schools of economic thought.

This philosophical spectrum of views still exists today, despite the leaps and bounds made in mathematical modelling, and heterodox economic theory. Why do we need to vote for the left when we can test their claims against an ever growing body of statistics? Why should we believe the right when we can model the effect of their policies using mathematics? I would argue that this manner of thinking is obsolete, and waiting in the wings is a much more proven, powerful and effective tool. That tool is science.

To many, the scientific method is a strange and confusing beast, best left to the labcoat adorned initiated and the tweed clad of university hallways. Science is however perhaps mankind's strongest and most proven system. It demands evidence; it fuels debate; it constantly assesses the knowledge acquired with the knowledge emerging, and is quick and brutal to spot any discrepancies. Science understands the mental predispositions of humanity, and designs methods to get around these biases and find the truth.

Despite this impressive curriculum vitae, science is applied in a piecemeal manner across society. While the process churns through the most complex questions of our time, the halls of parliament buildings churn with rhetoric and pseudo-debate. As science unravels mysteries to our origins, our pseudo-scientific economy attempts to unravel itself.

We must recognise these absurd inconsistencies within our civilisation. While we trust science to fly us around the world, to launch spacecraft and maintain our orbital communication systems, we seem happy to leave our social and

economic systems at the whim of ancient cultures and ideologically tainted posturing.

However, we must also consider that science is often an iterative process, which requires a great deal of time to solve complex problems. Human civilisation is an extensively complex emergent system. As such we must be realistic as to how science can be applied without chaotic implications to the populace. The specifics of this will be tackled later.

Using the scientific method, we can design policy rather than propose policy. We can test economic models in isolation, on computer screens and in small communities, before rolling these out to the population at large. We can pick on absolutely any aspect of society, examine it, test it and create improvements based upon the bias minimising methods of peer reviews and double blind tests. Economic theory can be designed from the ground up to be efficient, sustainable and beneficial to human existence.

The Beliefs

To many, the idea of arduously designing a society from the ground up seems absurd, given the organic and culturally driven development of societies in the past. However, as we have seen, humankind is not in the most advantageous position to weather the coming storm. From technological, societal, economic and environmental standpoints, the current economic model performs inadequately, and does not offer any coherent solutions to the approaching issues on the horizon.

We can no longer hope to lean wishfully on the shoulder of natural mock-evolutionary processes in order to deliver a long lasting culture of prosperity. Instead, we must accept that our self directed exuberance will lead us nowhere, except over the crest of a catastrophic overshoot, as its siren song has so ubiquitously entranced other species throughout the ages.

We must therefore pose the question; given the current quandary, what would be the ideal way forward? We know the significant problems that our economic model must be designed to overcome. To even hope of curbing our exuberant population growth before we massively overshoot carrying capacity, it is imperative that the developing world rises to a quality of life on par with the West, thus prompting birth-rates to fall. However, under a wasteful and consumption fuelled economic model, a fully developed globe is not possible without resource depletion.

Likewise, it is apparent from the findings of part one that the socio-economic structure upon which our civilisation is built has become inadequate to contain the voracious scientific expansion which has characterised our most recent century. How would a free market economy function when automation is easily applicable to a higher proportion of jobs? In order to safeguard waged labour into the technologically advanced, post-industrial future, either a system of work sharing, a reduced reliance on an income or a combination of the two must be put into place, both of which are unthinkable under the watch of a market system without significant reform.

It is also patently clear that the ecological buffers which limit our ability to throw raw materials through industrial processing are here to stay. While resource decoupling is often touted as the saving grace in our increasingly digital economy, we have seen that this is a gross oversimplification. Continual growth can never be an option in any civilisation which is aware of rudimentary ecology, and the looming prospect resource shortage casts a foreboding shadow over the future of our vapid and consumer-centric view of property.

Meanwhile, our energy and food security rests firmly on the shoulders of an ever dwindling volume of fossil fuel. This precipice over a terrifying energy scarce future demands that we seriously rethink both our energy sourcing techniques, and our efficient usage of the energy procured by such methods. Coupled with a sore need for efficient resource management, this potentially dire energy situation essentially rules out a system of cyclical consumption in absolutely any form, regardless of methodological breakthroughs in recycling.

Robust solutions to the above challenges must be hardwired into the proposed economic system, in order to avoid the calamity that a conventional* market approach has obfuscated for so long. Not only must these solutions reverse the trends that are already in motion, they must also set in place safeguards which prevent reoccurrence in the future.

In contrast to the archaic market, science is the most empirical approach that we have developed, and while it too can occasionally deliver biased and incorrect

** The use of the word 'conventional' is not intended to dilute any meaning here, as while the rawest form of the market incentive (the pursuit of self interest, channelled through a currency with a strict and narrow definition of individualistic value) may not be readily equipped to foster a stable and prosperous society, a radically reformed market of some form may cope better. Note that this meta-market (more on this later on, and in chapter 3.1) would necessarily be unrecognisable from a conventional, pseudo-evolutionary market incentive for the reasons listed, and would of course have to be empirically and rigorously justified.*

results, the onus within the system is to root out and improve these incorrect views, rather than conceal them to gain political leverage. Science as a mechanism is therefore the natural first choice for the task of running the most complex and chaotic system which humanity has ever created.

The Benchmarks

While the aims of this projected society are fairly obvious, the rules by which this society must operate are less so. As with any society, the governing principles and philosophies must be formally laid out in some manner. Within modern nation states, this typically takes the form of a constitution, which, in the broadest sense, creates a set of rules by which a nation must abide. What will be presented here for the post -market society may be somewhat different from a constitution in the traditional sense, but its aims and function will be the same. The constitution will set out the overarching philosophies which will drive the society.

Construction of the constitution will not dwell on the minutia, as much of this will be covered within the third section of the book. Instead, we will focus on general direction, and build the society from the broadest possible principles, as such, the constitution for a post market society may be more sprawling than what may typically be observed in extant nations, but simultaneously less verbose.

In order to flesh out this process, we may revisit the four pillars of human civilisation which we used to assess the robustness of our modern day socioeconomic system. To save page flicking to the opening chapter, these pillars were: Environmental, Technological, Economic and Societal. As explained previously, these pillars are not necessarily exhaustive, but none-the-less give a good, broad overview of human civilisation.

The divergence from the general train of thought within modern market capitalism arises when we consider the relationship between these four pillars. As diagrammatically hinted in the opening section of the book, these different aspects of our world are typically viewed as separate but interdependent systems. This is echoed within modern politics particularly, with different policies being drafted for each individual pillar (e.g. environmental policy, economic policy, social policy, science policy, etc). These legislations are generally viewed as overlapping in some sense, but are not viewed as strictly related to one another.

As a corollary to this, the post market society must recognise that, as we have seen in our assessment of the modern world, these are not separate pillars, but rather nested systems. As is immediately evident, society at its current scale cannot continue to exist on a social, economic or technological level if the environment is inhospitable or unstable. This is therefore the most critical and basal system from which all other systems must derive. Within the constraints of this system, suitable technologies must exist, such that the complex economic and social systems are able to function. However, these technologies must be environmentally constrained in order to maintain or improve the wider environmental system.

The thought process then descends into each lower order system, for instance, even given a sound environment, modern human civilisation cannot exist without adequate technological systems to produce food, energy, shelter and so forth. Descending into the next nested system, we observe that within a functional technological system, human society cannot operate optimally without a sound economy to distribute needed materials, skills and knowledge. This may then be interpolated to the individual, who cannot function optimally without a society that fosters such behaviour. This leads us to the nested system approach which drives the overall design of a post-market society, as shown in Figure 2.1-1 and Table 2.1-1.

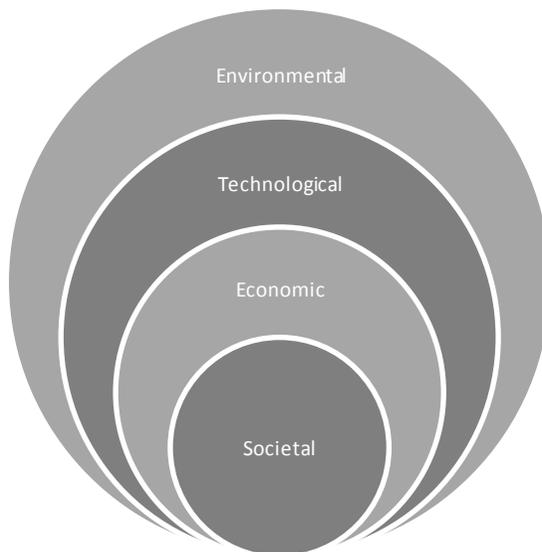


Figure 2.1-1: The nested systems view

Subsystem	Provides	Demands
<i>The Environmental System</i>	Raw materials, sustenance, a stable basis for human civilisations	Limitations on carrying capacity. Maintenance and protection from large scale human technological activity. Sustainable extraction of natural capital.
<i>The Technological system</i>	Efficient extraction and usage of raw materials and energy. Efficient transmission of data. Creation of various technologies to better humankind.	Upkeep and development by skilled human engineers and technicians.
<i>The Economic System</i>	Equitable distribution of goods, services, energy, materials and technology	A motivated population. Adequate volume of goods and services for the population. Technology and knowledge.
<i>The Social System</i>	A peaceful and prosperous life for the human individual. The meeting of human needs. Incentive structures to encourage beneficial human activity. Disincentive structures to discourage negative human activity.	Adequate and efficient provision of goods, services and technology.

Table 2.1-1: Dependencies and services within the nested system model

Note that in this breakdown, not only is each system wholly contained within the higher order system, but the higher order system is also symbiotically dependent upon the lower order systems. For example, the environmental system requires that the technological system does not extract from it at a rate which is unsustainable. It also demands that the technological system acts to maintain and protect the environmental system from human activity. Similar requirements are shown in the demands column of Table 2.1-1

In the event of the failure to fulfil a demand of a higher order system, all children of that system will fail. For example, if the economic system fails to provide labour, knowledge and materials to the technological system, then the technological system will fail, which will cascade down the chain and result in the failure of both the economic and social systems.

This is an important line of reasoning, as it not only allows us to create immutable and sweeping laws to generate the constitution for our society, but crucially, it also allows us to rank them. For instance, in the event that the social system fails to deliver its requirements to each human individual, the economic, technological and environmental systems remain in good health. This is therefore a less critical failure than if the environmental system were to fail. What this allows us to do is to create a series of benchmarks within the constitution which can be used to set the limits of the civilisation, using each of the systems as a point of reference.

Creating the Environmental Benchmark

Our world is a physical one, and it is upon its physical form that we are dependent. We require earthly resources in a wide variety of forms in order to function and prosper. This is academic from an ecological point of view, and is a point which is largely ignored by a free market paradigm, in favour of abstract perpetual growth, and unrestrained economic activity.

In order to sustain human life, it is imperative that global population remains comfortably within the maximum carrying capacity of the planet, adhering to the requirements of space, breathable air, clean water, food produce, access to energy, and availability of resources for construction of shelter and tools. In order to approach this simple principle which seems so difficult to balance, the ecological, resource backed reality we face must shine through and supersede any cultural construct.

Based upon this simple deduction, and the view of our nested systems approach, we may derive our first (and most important) benchmark in order to build our ground up social philosophy.

Our population must remain within the constraints of global carrying capacity, to a certain factor of safety.

Furthermore, we may also solidify the additional high-level requirements of the environment:

Our population must foster and act to maintain the natural processes which support it.

And;

Our population must extract all resources at a sustainable rate, to a certain factor of safety.

This simple set of rules encompasses the requirements of the environmental system, and comprises the highest order directives within our constitution to be.

It is useful to note the inclusion of the term 'factor of safety' in these benchmarks. This is perhaps not important with regards to the overall systems approach to the post market society, but it becomes important later on when we consider the more detailed technical specifications of how these systems might work. For now, consider the factor of safety as simply a manner by which we include uncertainty within the model.

Creating the Technological Benchmark

The technological system sits within the environmental system, and therefore shoulders most of the responsibility when maintaining its parent system. However, the technological system also has important requirements which must be fulfilled.

The primary function of technology within this model is to provide a reliable, efficient means to access the life supporting material which the environment provides. The technological system is blind as to how these means are distributed, as this falls to the responsibility of the economic system, however, the technological system must provide these processes, as we state in our first technological benchmark:

Our technology must be applied to the fullest extent in order to reliably and efficiently extract raw materials and energies which are necessary for human life.

The further benchmarks in relation to lower order systems may also be added:

Our technology must be used to facilitate efficient and accurate transmission of data in order to enable successful economic activity.

And;

Our technology must provide solutions which benefit humankind at all social and economic levels.

These points constitute the technological benchmarks, which sit below the environmental benchmarks from the previous subsection.

Creating the Economic Benchmark

Economy is a word which is so criminally misused and misunderstood in modern discourse. In market-centric political theatre, the economy has come to be treated as a proper noun, as if it were an entity in itself that is distinct from human affairs. In reality, the economic system is a set of rules by which we achieve economy, which is a state of affairs, not an object in itself.

Economy is achieved when usage of materials, energy, services and goods is efficient. Economy is therefore not an entity in itself, but rather the desired end goal of the economic system (and its parent systems). This reasoning is how we will approach the benchmark process for a post-market economic system.

The first benchmark of the economic system is in fact fairly intuitive when we consider economy as a result rather than a means. The requirement of the economic system is to take the spoils of the technological system and disseminate them to the population. This is embodied in the following benchmark:

Our economic system must provide an efficient process by which all humans have access to materials, energy, goods and services in order to meet their needs.

A further requirement placed on the economic system is to distribute human knowledge and labour to tend to the technological and social systems. This is embodied below:

Our economic system must fairly and justly distribute skills, knowledge and labour to activities which are in accordance with the social and technological requirements of this constitution.

The economic system is little more than these rules; it acts to distribute and optimise flows of resources based upon the technological and environmental reality.

Creating the Social Benchmark

As we have broached in part one of this book, the modern political establishment utilises broad proxies in order to represent social wellbeing. Availability of waged labour, economic growth and rising popular purchasing power are the gold standards by which most political tenures are judged. This is fundamentally erroneous on many levels, as we have seen. None of these criteria are correlated definitively with social wellbeing, and many indeed act to erode population health, both from a mental and physical standpoint.

To combat this, we must define a set of human needs which are immutable for successful social function, both at an individualist and collective level. This may prove linguistically difficult to convey, as a conflation of wants and needs is a central pillar of praise for the modern capitalist system. Under the heavily skewed and taboo phraseology of 'freedom', the ability for certain individuals to obtain absurd amounts beyond what they need is often heralded.

What is needed is therefore a rigorous societal hierarchy. Not a hierarchy of individuals based upon their purchasing power as we have today, but instead a hierarchy of needs. Fortunately, these hierarchies do exist and have been comprehensively fleshed out in psychological thought. For brevity, we will not consider the specifics here, but we will return to the concept of empirical and tangible human needs later in the book. For now, we just require the social system to meet these needs in order to define its function; this leads us to our first two social benchmarks.

Our society must aim to nurture our population through all possible and plausible means, generating the greatest possible absolute value and wellbeing.

And;

Our society must strive to meet the human needs of the entire population, without exception.

A further benchmark may be defined relating to the interaction of the social structure with the economy. The following benchmark may be considered to encapsulate both sides of the incentive coin.

Our society must encourage and promote human behaviour which is conducive to this constitution, while discouraging and preventing human behaviour which is damaging to this constitution.

This final benchmark is the last we need to capture our heuristic model of the post market society. With this set of rules, we have a fairly comprehensive framework around which we can develop the detail of the post market society. Granted, there is a great deal of empty space between these sprawling statements which must be filled in, but this can be fleshed out as we proceed.

The Constitution for a Post-Market Civilisation

We may now draw together the individual elements in order to create the constitution. As with many parts of this book, what I am presenting here is not necessarily exhaustive, but instead serves to illustrate the thought process behind a post-market world.

We will start with our aim:

Our overarching goal is to maximise the quality of life for each individual human being, now and into the future of human civilisation.

All of our organisational decisions must be guided by the strictest scientific and evidential reasoning in order to attain all of the above.

Tenets

Our population must remain within the constraints of global carrying capacity, to a certain factor of safety.

Our population must foster and act to maintain the natural processes which support it.

Our population must extract all resources at a sustainable rate, to a certain factor of safety.

Our technology must be applied to the fullest extent in order to reliably and efficiently extract raw materials and energies which are necessary for human life.

Our technology must be used to facilitate efficient and accurate transmission of data in order to enable successful economic activity.

Our technology must provide solutions which benefit humankind at all social and economic levels.

Our economic system must provide an efficient process by which all humans have access to materials, energy, goods and services in order to meet their needs.

Our economic system must fairly and justly distribute skills, knowledge and labour to activities which are in accordance with the social and technological requirements of this constitution.

Our society must aim to nurture our population through all possible and plausible means, generating the greatest possible absolute value and wellbeing.

Our society must strive to meet the human needs of the entire population, without exception.

Our society must encourage and promote human behaviour which is conducive to this constitution, while discouraging and preventing human behaviour which is damaging to this constitution.

Thus, we have our constitution. It is hoped that many of these tenets and requirements are self evident, but if the reader should disagree with these, or wish to add more, please feel free to make a mental note and carry this with you through the remainder of the book. It is hoped that the arguments presented are equally valid.

Continuing with this constitution, notice from the above that many axiomatic aspects of our current world are entirely missing. The idea of democracy is entirely absent from this view, instead being replaced by decision making based upon evidence rather than public consensus. There is no mention of competing nations as discrete and independent territories responsible for their own resources and people, nor is there any mention of prices, money or conventional economics

Does this mean that these trusted and age old conventions must be totally absent from this system? Not at all, we are not in a position to make such sweeping conclusions, however these elements are not prescribed as required, a distinction

which is worth drawing. This system is designed based upon the goals sought, not prescribed based upon the methods preferred.

Different Approaches

So what sets apart this approach of societal philosophy from the other 'alternative' societies that have been proposed in the past? Why should a citizen accept what is being said here as true when so many failed social systems have been proposed to deliver similar results?

There are of course innumerable different proposed approaches to alternative societal arrangement, and this precludes the possibility of their exhaustive discussion here. However, we may draw some parallels and differences with similarly audacious systems in order to illustrate the different line of thought behind this post-market system.

In the broadest possible senses, socialism and communism are philosophies which deal with the ownership of the means of production. In a capitalist society, the means of production is of course owned by the capitalist class, while in socialist economies, the means of production is owned by the common populace or the state. Communism goes a step further, and transcends the requirement for a state, promoting a classless society of common ownership.

Now, what is the common trait of these philosophies, and why are their pasts so littered with controversy? Crucially, these schools of thought are all bottom up solutions. They prescribe what the final state of their society will look like, and then retroactively attempt to justify why this society is the optimum choice, through argument or otherwise. Furthermore, these societal imaginings dwell exclusively in the lower order systems of economics and social function; they say nothing of the environment or the interactions of technology.

The prescription for our post market society is the complete opposite to all of these points. We have argued against the system of markets based upon the content of the first section of the book, and presented an alternative line of thought, but nowhere has the specific end result been defined. Using the scientific method, it would be remiss to attempt to pass off a prediction of the end result as a guarantee. I do not know exactly what a society following the tenets of this constitution would look like.

Even the more modern and outlandish social philosophies fall foul of this fallacy. Jacque Fresco's Resource Based Economy presents lush visions of an egalitarian and moneyless scientific society^[2], but do we know for sure that this

is really what a scientific society would look like? Participatory Economics presents a nice alternative to the inequality between people^[3], but like communism and socialism, it focuses entirely on social class dynamics, rather than definitive ecological principles.

This is the key difference behind a true scientific process and an ideological one. When designing an aircraft, an engineer does not draw the final design and then retrospectively justify why each part takes its form. Instead, the engineer begins with a list of requirements, and around this list, the various functions and geometries of the aircraft develop.

The engineer may have a rough idea of how the final design may look, but he is not emotionally or ideologically attached to any feature, and does not desire to retain any component that functions sub-optimally. Like the engineer's aircraft, a social system must also not have any final form set in stone; it must develop fluidly around a set of requirements.

Rejoinders

Of course, what has been prescribed in this chapter is controversial to many, and will naturally be met with stiff criticism by the public and academia alike. What we must broach is whether the common arguments against this direction are valid. Despite the market's clear shortcomings as a socioeconomic model, markets remain beguiling to the population based upon a wide variety of reasons. Is the market, for all its ills, actually the best possible option given the nature of human behaviour? Can an equitable scientific economy exist at all, given the vast differences between people across the world? The remaining chapters in this section of the book will therefore present arguments to defend the general presented direction.

Chapter 2.1- References and Notes

- [1]. This quote from Carl Sagan was taken from the television series; *Cosmos*, Episode 13, *Who Speaks for Earth?*
- [2]. Jacques Fresco, *The Best That Money Can't Buy: Beyond Politics, Poverty & War*, Global Cyber-Visions, 2002
- [3]. Michael Albert, *Parecon: Life After Capitalism*, Verso Books, 2003

2.2 The Human Nature Argument

THIS CHAPTER CONSIDERS a pervasive and toxic argument that is so readily wheeled out in defence of the current social order, and as a rebuke to any alternative proposals. The argument will be familiar to most, and is often as fluid as it is disingenuous. We are of course referring to the argument which is alluded to in the chapter title; the human nature argument, and for those who are fortunate enough to have never encountered this conversation ender, it is paraphrased approximately as follows:

The human mind by nature is inherently greedy / evil / competitive (delete as appropriate) and therefore any attempt to build a civilisation which is better than the current one will ultimately fail.

As suggested, this argument may be tailored to suit the point in question, and the human may be inherently inclined to just about any trait that the argument requires. What this chapter seeks to debunk is the common family of rejoinders from market apologists which attempt to align an idea of human nature to the behaviours which are encouraged by the structure of the current economic system.

Renowned economist, Murray Rothbard was one such market apologist, who was particularly liberal in his usage of human nature to defend his social structure of preference. In his provocatively titled work, *Egalitarianism as a Revolt Against Nature*, Rothbard argued that:

"[T]he portrayal of an egalitarian society is horror fiction because, when the implications of such a world are fully spelled out, we recognize that such a world and such attempts are profoundly antihuman; being antihuman in the deepest sense, the egalitarian goal is, therefore, evil and any attempts in the direction of such a goal must be considered evil as well."^[1]

Aside from the obvious conflation of equality of opportunity and equality of outcome (another classic market apologist fallacy), Rothbard's appeal here is to an unchanging and constant state of 'human', with any significant deviation from this perception being labelled as 'antihuman' by nature. Rothbard continues:

"The age-old record of inequality seems to indicate that this variability and diversity is rooted in the biological nature of man. But it is precisely such a conclusion about biology and human nature that is the most galling of all possible irritants to our egalitarians."^[2]

Rothbard again casts his argument upon an unchanging "biological nature of man", which is confirmed and verified against the "age-old record" of historic inequalities in past civilisations. This is at least superficially compelling, as history does seem to point out an inclination toward strident competition, hierarchy and classist violence, but what is the reality behind this?

Are humans inherently competitive creatures who strive for inequality, and if so, why then is economic inequality so corrosive at an epidemiological level (as we have seen in chapter 1.8)? Why does societal well-being seem to correlate so convincingly with greater parity between people?

Competition as Human Nature

Competition as a broad concept is very important in a healthy society. We compete with each other in sports, for mastery of certain skills or knowledge, partners, one-upmanship, and for a myriad of other social phenomena. With this in mind, we must be quick to cut through Rothbard's straw man of equality, and dismiss his "*world of faceless and identical creatures, devoid of all individuality, variety, or special creativity*"^[3] as the ideological scare story that it is.

When we discuss equality henceforth, we strictly refer to the concept of equality in human rights and economics. A world where the population are less economically disparate in their access to resources and services does not mean a world of identical, faceless clones; this bare-faced disingenuity should be seen for what it is.

However, we must assess Rothbard's claim as to whether the state of inequality amongst humans is a 'natural' condition that can never be changed without creation of a statist "horror fiction". Rothbard is perhaps at somewhat of an unfair advantage here, as he compiled his aforementioned work in the mid 1970s, without access to the vast tomes of scientific analysis that we so readily enjoy today.

No doubt to Rothbard's post-mortem dismay, the extent of human motives in competitive and collaborative environments have been quite exhaustively assessed through various means, which we will peruse currently. Due to the gravitas that neoclassical and market-centric ideology places upon the axiom of competition, we will spend some time thoroughly debunking and discrediting the oversimplified view of economic competition amongst humans as a hardwired, inflexible prerogative.

Game Theory

It is prudent to first pose the question as to why we compete. It is obvious to see that human beings have been forced to make choices between competitive and collaborative approaches to life for time immemorial, but what is the prime mover in these choices? Within a society of any variety, the choice between acting for individual or mutual benefit is ubiquitous.

Sociologists have grappled with the rationale behind these choices for centuries, often hindered in their progress by the complex behavioural temperaments of human beings, and the myriad of affectors to consider when assessing their interactions. The development of game theory, cemented in Neumann and Morgenstern's *Theory of Games and Economic Behaviour* in 1944, offers a reasonable insight into the world of human interaction and cooperative versus competitive choices^[4], though it is not without its shortcomings.

The issue that is commonly expressed over game theory is that the system is too abstract and simplistic in comparison to actual human interactions. However, it is useful in giving an idea to the forces that act behind human behaviour, and how various factors may affect these forces.

An initial assessment of competition through the lens of dyadic (two player) game theory is offered presently. There are a plethora of games within the theory which are used to probe at the nature of competitive and cooperative behaviour. Such games include chicken, classically embodied in real life by two cars racing towards each other head on, as was the trend for youngsters up to no good in 1930s California. This is exhibited in the matrix in Figure 2.2-1, where players are labelled as I and II.

		I	
		C	D
II	C	4:4	2:5
	D	5:2	1:1

Figure 2.2-1: Matrix for the two player game of 'Chicken' - note that it is typical to represent game theories in matrices such as this, where the numbers in each square represent the 'score' each player receives if that combination of choices plays out - Adapted by author from [5]

Each actor (I and II) is presented with a choice when entering the chicken game: to play cautiously (Cooperatively or 'C') or dangerously (Defect or 'D'). If both players are cautious, then the game ends with both players alive, but nobody really wins, a score of 4 for both players. If one plays dangerously and the other cautiously, then one player will win (5) and the other will be labelled “chicken” (2). However if both players approach the game dangerously, then the cars crash and both are injured or killed, incurring the worst outcome for both (1).

An interesting property of chicken is that the competitive choice cannot be approached without risking the worst outcome for both actors. If both actors enter the game with the rational objective of winning, then the outcome of the situation is irrational. This risk is reflected in the results of games of chicken in controlled trials, as a study by Rapoport and Chamah in 1969 saw cooperative choices in the game reaching 70% over 300 trials. A large proportion of games therefore resulted in both players settling for a shared score of 4, compared to just 30% where one or both players attempted the high score^[6].

The relevance of a game involving two cars hurtling toward each other may seem apart from any tangible real life situation, but the basic principles of chicken have been used in international politics on more than one occasion. Consider the various instances of brinkmanship in modern wartime diplomacy. Daniel Ellsberg argued in 1959 that Adolf Hitler decisively won several games of chicken in the 1930s, by irrationally forging ahead into the Sudetenland with a blasé attitude to any threats of retaliation^[7]. Similarly, as Bertrand Russell illustrated in 1959, the brinkmanship played by the U.S. and the Soviet Union during the 1962 Cuban Missile Crisis stands as one of the most stubbornly irrational games of chicken in history^[8].

As two superpowers hurtled toward one another, not piloting simple automobiles, but rather commanding arsenals of nuclear warheads, the hope at all times was that the other would back down and one could claim an egotistical victory. But of course, this is not what happened, and the threats from both racing nations continued to escalate, pushing not just themselves, but the entire global society to the brink of total destruction. Eventually, the worst case scenario of nuclear war reared its head as a possibility all too real, and both powers swerved away from head on impact, settling for a more cooperative outcome.

Chicken however remains a fairly niche game, which has only limited real world applicability. A more popular and thoroughly investigated game in the field of mixed motive dyadic game theory is the famous Prisoner's Dilemma Game or PDG. The PDG is based upon a hypothetical situation involving two guilty criminals, who have been apprehended, and are currently being questioned. No solid evidence is available to convict the pair, and so the police rely on verbal confessions. The criminals are held in separate rooms for questioning and no communication between them is possible.

Each prisoner is faced with a choice: they may either choose to conceal the evidence and remain tight lipped (Cooperate or 'C'), or they may divulge the information, thus ratting out their comrade, but saving themselves from prison and receiving a reward for their diligence (Defect or 'D').

		I	
		C	D
II	C	3:3	1:4
	D	4:1	2:2

Figure 2.2-2: Matrix for the two player 'Prisoner's Dilemma Game' (PDG) - Adapted by author from [9]

The PDG is interestingly distinct from chicken as the logical choice for both players is to defect regardless of whatever the other prisoner chooses. The defect choice offers either the highest reward (freedom and a monetary reward – a score of 4) or in a worst case scenario a reduced joint sentence (a score of 2).

What complicates matters is that despite D being the most logical choice from a self interested standpoint, if both actors are rational and choose to Defect, then their outcome is worse than if they irrationally choose to Cooperate. The PDG is no doubt an important and paradoxical game, and as such has been tested extensively in the literature. This very game is often invoked to explain a plethora of scenarios where individual rational choices result in a collective irrationality.

In trials where the PDG is repeated by the same players numerous times, it was predicted by Luce and Raiffa in 1957 that cooperative choices would eventually dominate, as players came to an understanding of each other and an 'unarticulated collusion' would develop^[10]. However it was discovered in later studies that the so called D-D lock in effect is what actually became prominent over long repeated game trials.

This effect has been observed in hundreds of experiments, and occurs when both players repeatedly choose to defect, either due to lack of trust, or in an attempt to maximise individual gain. The lock in occurs as the continual defect choice from the opponent prompts the other player to repeatedly defect.

Rapoport and Chammah observed in 300 game trials that initially cooperative choices would make up just over 50% of the game outcomes. This initial phase would be followed by a so called 'sobering period' where trust between players would deteriorate, resulting in a long D-D lock in. This lock in period would then be succeeded by a recovery of cooperation through unarticulated collusion, with the 300 game trial ending at about 60% cooperation^[11].

A third game which is worth perusal here is an altogether more simplistic affair. The Maximising Differences Game (MDG) really only has one defining goal: to maximise individual gain. The game is set up so that when two players cooperate, the maximum score is obtained by both, with the minimum score being conversely offered when both players choose to defect. The game is made slightly more interesting by what happens when a single player defects. If player I for instance chooses cooperatively, while player II chooses to defect, then player II 'steals' some of player I's points, resulting in player I scoring 1 and player II scoring 2. The reverse occurs if the player's roles reverse. The matrix is shown in Figure 2.2-3.

		I	
		C	D
II	C	3:3	1:2
	D	2:1	1:1

Figure 2.2-3: Matrix for the two player 'Maximising Differences Game' (PDG) - Adapted by author from [12]

Logically there is no rationale to ever choose to defect in the MDG as the maximum individual score is obtained when both players cooperate. However, the uncertainty that the opposing player will steal points by defecting means that in 100 game trials, for example by McClinock and McNeel in 1967, only 50% of choices end up being cooperative^[13]. It is clear that a similar effect to the D-D lock in as per the PDG comes into play when competitive defection choices create a spiral of spitefulness, as players attempt to maximise relative gain rather than absolute individual gain.

Effects of Communication

It must be noted that while analogous scenarios can be conjured to support these simplistic games, it is exceptionally rare that such situations would play out in a complete vacuum of communication. As all dyadic games mentioned in the previous subsection are, by definition trialled in an absence of communication, it seems relevant to cover some mutations of these games where the effects of communication are assessed. Nemeth (1972) argues that such a void of communication may have an impact upon the often uncooperative behaviour trends in classic dyadic games, including effects such as the PDG's D-D lock in, and point stealing in the MDG^[14].

Wichmann in 1972 probed the effects of the nature of communication by setting up a trial of 70 PDGs. Each of the trials differed in whether participants could see their fellow player but not hear them, hear but not see them, both see and hear or not see or hear the other player at all. The spread of results showed a fairly linear progression, with cooperation being least prevalent in trials with no communication, more so in the sight-only trials, more so still in the hear only trials and most prevalent in trials with full communication. This indicates that communication is of particular importance when fostering trust to cooperate^[15].

The aim of the game in each case is also of importance when considering the effects of added communication. Deutsch in 1958 found that cooperation only increased in the communicative PDG if players were instructed to perform individualistically and to maximise their own score. In contrast, when players were encouraged to compete with one another, cooperation fell regardless of communication, and when encouraged to be cooperative, cooperation rose regardless of communication^[16].

This suggests that with added communication, players in the PDG are more readily able to develop a trust, and despite being encouraged to maximise their own score, come to a mutual agreement more readily. This is a reflection of the uncertainty in the game when attempting to maximise individual scores, as the defect choice may lead to fruitless D-D lock-ins if sufficient trust is not present. Conversely, when the games are competitive or cooperative, the decisions are much clearer cut, and the players are less at the whim of the relationship between the two.

The Triangle Hypothesis and Attribution

An important factor to consider in human cooperation and competition is the effect of perception. It is clear from the analysis above that communication and trust between players is of some significance when determining whether a game will be dominated by competitive or collaborative outcomes.

A series of studies in the 1970s by Kelley and Stahelski added a new point of focus within the PDG (with no communication). The studies recorded each player's intention to play the game cooperatively, competitively or individualistically prior to each trial of the PDG. After each round of the game, the players were questioned as to whether they were able to discern their opponent's tactics or motivations.

Players who entered the game with a collaborative game plan felt confident in their opponent's inclination within 10 games, while competitive players struggled to discern their opponent's game plan after the full 40 games^[17]. This observation gave rise to Kelley and Stahelski's triangle hypothesis, a diagram of which is presented in Figure 2.2-4.

Player's Intention	Perception of Opponent		
	Cooperative	Neutral	Competitive
Cooperative			
Neutral			
Competitive			

Figure 2.2-4: Kelley and Stahelski's triangle hypothesis - Adapted by author from [18]

What the hypothesis posits is that the competitive player perceives other players as all being competitive like themselves, while cooperative players more readily accept that other players may be of any behavioural inclination. The triangle hypothesis has been corroborated in PDG trials by Miller and Holmes (1975)^[19] and Kuhlmann and Wimberley (1976)^[20] although the effect is considered less pronounced in non-PDG games.

Multiple Person Games

The dyadic, one versus one games of the previous subsections offer a useful initial insight into human motivation and behaviour when faced with mixed motive situations, however they are limited in their usefulness by the fact that they are one-on-one. Complex human interaction, particularly in modern politics, economics and industry is a multiple actor affair, not limited to the single opponent offered in the aforementioned games.

The 1970s saw the PDG undergo an additional facelift, as Dawes (1973), Hamburger (1973) and Schelling (1973) simultaneously developed multiple person versions of the PDG^{[21][22][23]}. The N-Person Prisoner's Dilemma or NPD as it became known has been rigorously studied since its inception, and has allowed human behavioural patterns to be scrutinised under very different circumstances.

The NPD in a real life scenario may be envisaged in Garrett Hardin's *Tragedy of the Commons*, whereby multiple farmers graze cattle on a shared pasture. It is in the interest for each of the farmers to maximise personal gain by grazing more cattle on the pasture, but if all farmers choose to do this, then the situation results in overexploitation of the land, the worst case scenario for all^[24].

Hardin's essay has been widely criticised as unrealistic in the context of the metaphor*, but the hypothetical ramifications of the scenario still stands to reason. Consider global population growth as a tragedy of the commons, whereby families rationally choose to have multiple children. This rational choice cumulatively results in a net outcome which is irrational, as a large population brings a plethora of problems, such as pollution and overcrowding†

Additionally, the NPD may be used to represent the behavioural trends observed in innumerable situations, from economic to political diplomacy and administration, to interpersonal bargaining and discourse. It is because of this that the NPD has become a widely researched game within the scope of game theory. Rather than being modelled by an N by N matrix, the NPD is better expressed graphically as shown in Figure 2.2-5.

From the graph we can see that the logical choice throughout is D, as it offers a higher payoff regardless of how many actors choose cooperatively, however this attribute of the game is unchanged from the two person version. What does however alter when considering a multiple person game is the effect of group size on the levels of cooperation and competition. Group size has had a well observed and consistent effect on competitive behaviour, corroborated in studies by Marwell and Schmidt in 1972^[28], Hamburger et al in 1975^[29] and Fox and Guyer in 1977^[30]. All studies point to increased competition and less collaboration as group size increases.

The leading explanation of this pattern is the de-individualization hypothesis, proposed by Hamburger et al in 1975. This posits that as group size becomes progressively larger, the identity of the individual as a part of the group lessens, as they become a more anonymous 'face in the crowd' so to speak^[29].

* *Frustratingly, criticism of Hardin's parable has generally focused upon the exact example that he uses, rather than the broad dynamics of rational choices leading to irrational outcomes^[25]. A bulk of the criticism surrounds the fact that historically, farmers or states have come to agreements to manage common land properly and prevent overfarming - the irony of this is lost on market proponents.*

† *It should be noted that market proponents have attempted to reconcile the market with the concept of Hardin's Tragedy of the Commons through the enforcement of property rights. Free Market Environmentalism by Terry Anderson is perhaps the most authoritative work on this topic, but it admittedly concedes that certain collective irrationalities, like water and air pollution seem to be issues which cannot be readily solved by a competitive market solution^[26].*

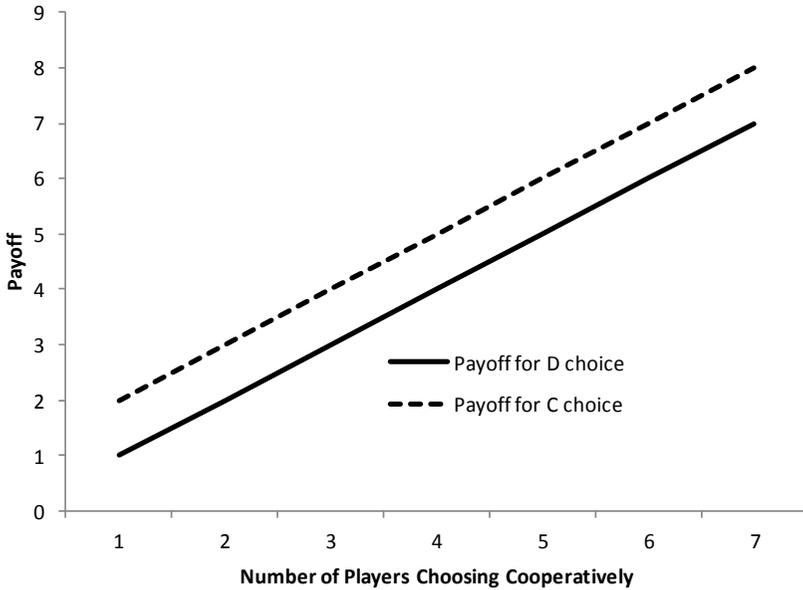


Figure 2.2-5: Graphical plot of the NPD - Adapted by author from [27]

This de-individualization also brings lesser accountability to each player, meaning fewer stigmas associated with defecting. This hypothesis has been indirectly supported by results from Fox and Guyer in 1978, whereby individuals were trialled making their choices publically or anonymously, with more cooperation being observed in the publically announced trials^[31].

Caldwell in 1976 also corroborated the importance of de-individualization and anonymity by trialling not only with and without announcement of choices, but also adding sanctions which could be enforced against players who set out to deceive^[32].

Humans as Staunch Competitors?

So can we be led to believe that humans are naturally inclined to competition and will chase one-upmanship regardless of circumstance? Through the lens of bread-and-butter game theory principles it is obvious that competition is of a great deal of importance when analysing human affairs. But the significant differences in behaviour, which are observed simply by altering seemingly extraneous variables is food for thought that should bring any competition-centric belief into question.

The payoffs within the game structure itself, sufficient communication and feelings of individuality are just some of the nuances to consider when assessing competitive tendencies, and all of this is before considering the combination of each player's predetermined disposition or reasoned gameplan.

Furthermore, Kelley and Stahelski's triangle hypothesis shows us that ultimately a clash between a competitive and a collaborative player in a mixed motive game is more likely to descend into a tit-for-tat struggle, due to competitive players' difficulty in attributing other players as anything other than competitive.

As an aside, it seems interesting what Kelley and Stahelski's triangle hypothesis tells us about competitive individuals' attribution of competitive traits to others. Are such criticisms of collaborative economic principles simply being perpetuated by individuals who are themselves competitive, and thus perceive all others to be equally competitive? It seems intuitive to suggest that competition centric worldviews could be simply the projections of the individual's own competitiveness; a view that may be further corroborated when such competitive traits draw collaborative and neutral minded individuals into tit-for-tat style slugfests.

The triangle hypothesis is however just one field of study within game theory. The importance of intuition, and 'gut feeling' when participating in economic scenarios has also garnered interest in recent years. A 2012 study using economic games found that when relying on intuition, participants behaved more cooperatively than when they were asked to approach the game with a more reflective mindset. The study concluded:

"We find that across a range of experimental designs, subjects who reach their decisions more quickly are more cooperative. Furthermore, forcing subjects to decide quickly increases contributions, whereas instructing them to reflect and forcing them to decide slowly decreases contributions. Finally, an induction that primes subjects to trust their intuitions increases contributions compared with an induction that promotes greater reflection. To explain these results, we propose that cooperation is intuitive because cooperative heuristics are developed in daily life where cooperation is typically advantageous."^[33]

The fact that cooperation seems to occur more intuitively amongst humans in economic scenarios is again a problematic truth for Rothbard's market apologetics. If humans are indeed staunchly competitive, then this brand of behaviour is difficult to rationalise. In spite of these strong conclusions toward

human cooperation being intuition, we must however be careful as not to wander into the realm of speculation, and instead remain firmly rooted in what is known. What has become clear through perusal of basic game theory, is that criticism of a more collaborative future for the global economy based on humanity's unwavering love affair with competition is a gross oversimplification of human behavioural tendencies.

Game theory is however self admittedly inadequate to form a total basis on human interaction, as the fact that the players are fully aware that they are playing an imaginary game is in itself a shortcoming when modelling social situations. To progress onward, it seems prudent to assess a range of real life human societies, and look for the roles played by competition and collaboration within their customs and cultures, absent of games or experiments.

Competitive and Cooperative Societies

When confronted with the idea of a primarily competitive or collaborative society, most minds will tend to race back to the lumbering showdown of the Cold War. Those gruelling decades, steeped in mistrust and paranoia epitomised the last great ideological battle of the modern era, as an amalgam of totalitarianism and collaboration locked horns with freedom and competition.

For many, the collapse of Stalinism and the fall of the Soviets was the ultimate answer, and the final nail in the coffin for such idealism. The enforced collaboration exhibited in Soviet and Chinese dictatorships during the latter half of the 20th Century demonstrably proved how out of sync with human nature cooperative utopias were, and how quickly such ideals quickly descended into tyranny.

Yet this rigid perception falls into the trap of false dichotomy, and its absolutist conclusion reeks of cultural relativism. Game theory has enlightened us somewhat in the nature of human behaviours under artificial mixed motives, and tendencies across the board have been surprisingly fluid for a species oft assumed to have such inflexibly competitive natural programming. Is the same variability true of living, breathing societies?

The proliferation of markets as the international means of economic communication prohibits an analysis of this facet somewhat, as immediately all nations taking part in the global community on a large scale must build their economies around an ideal which is inherently competitive.

It thus becomes difficult to assess sizeable communities which operate with wildly different traditions, as the uniformity of worldwide market incentives render most nations equally uniform in the big picture. While the socialist governmental and organisational aspects of Chavez's Venezuela may be worlds apart from the undiluted markets of the USA, both still compete hand over fist for resources, imports and exports in the global GDP race.

Fortunately, while the shadow of the global market is cast long and wide across the land, there remain a plethora of smaller societies who exist isolated from its influence. In 1937, Margaret Mead, the renowned American social anthropologist set out to assess these microscopic societies, specifically from a standpoint of competition and collaboration^[34]. For reasons inconsequential, Mead's initial paper did not immediately open the floodgates for similar studies to elaborate, and it was not until the late 1960s and the development of rigorous game theory that additional research became popular.

Sub-Saharan Africa is a home to many such small societies, and has attracted a great deal of research. The Bushmen of the Kalihari^[35] and the Mbuti of the Ituri Forest^{[36][37]} are two such societies which have been studied rigorously. Both groups of people are nomadic in nature, subsisting with hunting and gathering, and have been spoken of with great affection by social anthropologists.

The nature of hunting and gathering as a means of food acquisition requires great levels of interpersonal cooperation, and this basis of collaboration is reflected in the societies' structures. Neither people operate with any type of formal decree of exchange which demands or tallies sharing and equal access to resources, yet both the Bushmen and the Mbuti are staunch in their cooperation, and value interpersonal collaboration above all. The people are egalitarian both between peers and with gender parity, and while some bands do feature hereditary chiefs, the method of decision making is discursive, with agreement on an approach occurring only with consensus.

Thomas (1960) stated that "*No bushman wants prominence*"^[35], and Colman (1982) added that the bushmen and the Mbuti "...value helpfulness and cooperativeness, and dislike the strife and noise to which jealousy and meanness give rise."^[38] Possessions are also treated with a similarly low level of emphasis with the bushmen "...preferring to give away a fine possession to enduring the ill-feeling of that would result from him keeping it."^[38]

What is however interesting given the numerous similarities between the Bushmen and the Mbuti is the stark difference between their natural environs.

The Kalahari Desert is an unforgiving mistress, with surface water and game being scarce. Such scarcity is echoed in the gruesome but begrudging necessity of infanticide during times of particular hardship. However, the Bushmen's kindred spirits of the Ituri forest in Zaire inhabit a far more abundant and fruitful environment where shortage is uncommon. This is interesting as it shows that cooperation within a society is not purely contingent upon resource abundance, and even in the face of severe hardship, the strength of a cooperatively positive culture can still remain a driving force in human behaviour.

The plight of the Mbuti and the Bushmen is however one of nomadic wandering, with the travelling bands being prohibited in size by their lifestyle. Such small groups of people are subject to lesser de-individualisation as we discovered in our perusal of the NPD, and are consequently more likely to cooperate. It seems prudent to therefore inspect some slightly larger and more settled societies in order to see if this lifestyle shift has any significant effect on the interactions between people.

The Swazi of southern Africa are a settled people who subsist through an agrarian lifestyle. Food is produced via crops and livestock, with bovines specifically being raised as symbols of prosperity and prestige^{[39]-[41]}. The Swazi exist in villages made up of close knit family units, with the head of each household being responsible for organising work parties to maintain and further the interests of the household and village.

Each head gathers kinsman for a task by offering comradeship and a shared meal with alcohol, rather than a pre arranged wage. Groups of workers apply themselves to various enterprises around the village in this way, helping other homesteads or individuals as is requested, expecting only a meal and the favour to be returned. This cooperation across the village leads the Swazis to be culturally suspicious of selfishness or self importance, and to cherish the ideals of camaraderie, obedience and respect^{[39]-[41]}.

The Chewa are a similarly cooperative settled people, but with a far more freeform approach. The matrilineage of the Chewa means that the family units are less defined, and numerous matrilineages may exist side by side in the same village or even household. The households of a Chewa village often contain a more extended family, with men taking up a role of a guardian rather than a leader.

Men are duty bound to aid their sisters when requested, but may do so by enlisting the help of others if need be, again only requiring the offer of a shared

meal and reciprocity. The Chewa are an equally peaceful people, who progressively abandoned their older ideals of brutal punishment for crime, in favour of a culture of meekness and freeform cooperativeness^[42].

Do not however be lulled into the idea that simple societies are inherently cooperative, as there are a great deal of societies which do not adhere to the meek egalitarian worldview so common in sub-Saharan Africa. In order to be balanced, we must address the opposite end of the spectrum in equal measure, that is, societies where competition is the dominant modus operandi and cultural force. Perusing such cultures, we stumble upon the Ifugao people of the northern Philippines.

The Ifugao are a rice producing society deeply entrenched in class^{[43][44]}. Three classes are identified within the Ifugao, each based upon the control over rice producing resources, and the subsequent wealth created by such reserves^[45].

The highest class in the society is known as the kadangyang, who are defined as those able to produce rice at a surplus and thus sell to accumulate capital. The middle class in Ifugao culture is the natumok, who are simply able to produce rice sufficient to subsist for themselves and their immediate families. The lowest class of Ifugao are known as the nawatwat, literally translating to 'those who will go hungry.' The nawatwat are frequently dependent on paddies rented or loaned from kadangyang in order to produce any rice at all, opting instead to rely on a kind of sweet potato for sustenance, a cuisine which is derided as a symbol of poverty and low status^[45].

The rite of passage into the kadangyang class is one of expensive pomp and circumstance, requiring the construction of a ceremonial bench outside one's house, and the throwing of a number of opulent feasts and animal sacrifices. Little wealth within the kadangyang is passed through generations by inheritance, and the offspring of a kadangyang can pass into his father's class only through accumulating wealth himself.

The requirement to earn wealth by any means necessary often leads to kadangyang running businesses of usury, based upon any small surplus of rice produced. Loans with 400% interest are uncommon in long term cases, and debts are passed on to relatives after death. Kidnapping and headhunting for unpaid debts is commonplace, as Ifugao who allow debts to remain uncollected lose prestige and are taken advantage of.

It is also interesting to note that the nature of the terrain which the Ifugao call home is one of mountainous inhospitality, and rice paddies are carved into terraces in the mountainside to maximise possible land area. Such scarcity of area to produce precious rice is at least partially responsible for the competitive nature of the Ifugao people, as the Kalingas of the more plentiful neighbouring province share many cultural similarities, yet are not as outwardly competitive as a people^[46].

A slightly more bizarre competitive society is observed amongst the Kachins of Burma, a people in constant flux between an egalitarian society and a totalitarian autocracy^[47]. The egalitarian side of the bipolar Kachin is known as the gumlao, where headmen of various households are held on approximately equal footing. This ideal is however frequently challenged by struggles for wealth and influence between each of the headmen, and great feasts are thrown in order to cement each one's superiority over the others.

Through such showings of decadence, an individual headman will emerge as dominant and will attempt to seize power, with such actions commonly accompanied by falsified claims of divine ancestry. It is unclear how and why the remaining Kachin accept their new ruler, but over a period of time the dominant headman will cement his autocracy by demanding tributes from his new vassals. This period of rule is known as the gumsa^[47].

However, the new autocrat holds little organisation power and merely commands the ability to receive ritual tribute. If these demands become too unreasonable, or if the population grow weary of the ruler, then a grand revolution takes place and all wealth is redistributed equally. The Kachin thus return to the gumlao, and the whole cycle of competition begins again^[47].

While the competitive caste society of the Ifugao and the cyclic power struggle of the Kachin may strike a certain chord with Western civilisation, we are all left categorically embarrassed by the competitive individualism of our final society. To examine this group of people, we return to the assumed bastion of egalitarianism that is sub-Saharan Africa, specifically to the Ik of Northern Uganda.

Let it first be said that the primary source for our account of the Ik comes from Colin Turnbull, the same anthropologist who spoke with such compassion of the Mbuti of Ituru. However compassion is not the word one would use to express Turnbull's impression of the Ik by any stretch of the imagination.

Such vitriol is spewed by Turnbull in his controversial study of the Ik, dubbed *The Mountain People*^[48] that he has drawn harsh criticism from fellow anthropologists and even the Ik people themselves^[49]. Criticism aside, Turnbull's overblown analysis of the Ik stands as a sombre testimony to the effect of inadequate resources on human behaviour, and by proxy the effect upon human culture and morality also.

Turnbull visited the Ik during a two year famine. It is asserted that the local government ousted the Ik from their ancestral hunting land thus forcing them to settle, but this was later shown to be untrue, and the Ik had been agrarian for some time. The people live in villages which are more gatherings of convenience than cohesive units, generally being uncommunicative between households.

Even within households, food is only begrudgingly shared, and often eaten alone out of fear of losing it. Children in Ik society are given minimal guidance by parents, and generally leave the household at a very young age, forming bands of youths. These youths seek out food wherever available, frequently stealing from old or sick villagers.

The aspects of the famine are certainly interesting, supposing that there is some truth in Turnbull's reporting, as it demonstrates how human behaviour degrades into callous self interest when environmental stimuli reflect nothing but shortage and strife. Still, the criticism of Turnbull in his analysis of the Ik has been strident ever since the publication of *The Mountain People*, which leaves us with only anecdotal evidence at best for human cultural decay under extreme and prolonged resource scarcity.

Empirical evidence however is available attesting to the behavioural differences across cultures when approaching mixed motive challenges. The aforementioned simple behaviour games, such as the prisoners dilemma, the maximising difference game and others have been used extensively in probing cross cultural behaviour trends, including infiltrating simple societies as analysed here.

The results are perhaps unsurprising, with increased cooperation occurring in societies which are they themselves more cooperative. Kikuyu in Kenya are more collaborative in mixed motive games than white Americans^[50], while Israeli Kibbutz denizens are more collaborative than their city living countrymen^{[51]-[53]}.

Rural and poorer areas within countries also foster greater cooperation, with Mexicans from the countryside more likely to cooperate than their urban neighbours. The trend is also not limited by racial or genetic boundaries, as urban Mexicans residing in Mexico remain more cooperative than those living in America, and more cooperative still compared to white Americans^{[54]-[57]}.

The effect of Western influence is equally stark elsewhere, with people immersed in Western culture acting more competitively regardless of nationality or racial background. This finding has been confirmed by studies in Liberia between traditionally educated and Western educated citizens^[58]; Zambia, between isolated Tonga people and urban city dwellers^[59]; Australia, between Aborigines and white Euro-Australians^[60] and New Zealand, between traditional rural and city dwelling Maori^[61].

The Noble Savage?

The meek and egalitarian behaviour of simple hunter gatherer societies around the world came as somewhat of a shock to the early colonial explorers who encountered them. Christopher Columbus spoke of the "*artless and free*"^[62] nature of Native Americans he encountered when landing in the New World. Some 300 years later, Captain Cook shared similar warm words about the aborigines of Australasia;

"They live in a Tranquillity which is not disturb'd by the Inequality of Condition: The Earth and sea of their own accord furnishes them with all things necessary for life, they covet not Magnificent Houses, Household-stuff etc... In short they seem'd to set no value upon any thing we gave them... this in my opinion argues that they think themselves provided with all the necessaries of Life and that they have no superfluities."^[63]

The ubiquity of glowing adoration for hunter gatherers by Westerners has contributed to what has become a somewhat irksome view of simple societies. The noble savage view sees humans as naturally peace loving, tranquil, beautiful creatures who are inclined to live in harmony with nature, but have been perverted by modern society to be violent, greedy and covetous.

This section of the book is not trying to pen such sweeping conclusions regarding humanity, nor is it trying to suggest that humans are inherently perfect beings who will live in perpetual peace and bliss under the correct circumstances. As such, the noble savage view is rather dangerous, as it posits

that humans outside of the global industrial capitalist system would be instantaneously able to uphold a society of wondrous peace and tranquillity.

The noble savage is therefore an important concept to debunk, as even today, the hard anti-establishment left still retains a soft spot for romanticised primitivism. Santa Fe Institute economist, Samuel Bowles argues against the noble savage view by stating that hunter-gatherers evolved as “*parochial altruists*.”^[64]

The “parochial” refers to primitive societies being solely concerned with the well being of their own particular group or tribe. Within that group, they would act generously, altruistically and with staunch egalitarianism, but would battle with their rival communities in violent and underhanded ways. Bowles’ argument is that in conflicts between groups, “parochial altruists” who were ready to bravely sacrifice their own lives for their peers, would be more likely to defeat their rivals than groups where each member selfishly looked out for themselves or their immediate family^[64].

When modelling such scenarios between rival groups, Bowles concluded that there was a “*markedly higher reproductive success of predominantly parochial altruist groups when interacting with groups with fewer parochial altruists*,” resulting in the possibility of very rapid evolution of these traits, “*occurring in less than 200 generations, or about 5,000 years*.”^[65]

So parochial altruism was a powerful force in evolutionary selection amongst hunter-gatherers, but even this brand of altruism was somewhat different to the meek, good-natured charity that Columbus and Cook spoke so highly of. Instead, this altruism manifested in a kind of an assertive egalitarianism, an strong social pressure towards in-group sharing that would have made modern philanthropists feel uncomfortable. Anthropologist Nicholas Peterson talked of “demand sharing,” in which members of hunter-gatherer groups would mutually announce to each other what they want, and would expect that it is given to them without hesitation^[66].

This kind of culture toward enforced egalitarianism frequently leads to the receipt of gifts by the community being viewed as problematic, or even greeted with a degree of scorn. Outsiders offering gifts to the community is seen as ostentatious, and a taboo expression of arrogance, while those within the community sharing gifts with others is seen as an expectation that will be downplayed and talked of with quiet modesty.

Anthropologist Elizabeth Cashdan explained this response as part of the intense social pressure towards egalitarianism:

"Bushman groups... are ... typified by strong and continual socialization against hoarding (i.e., toward economic equality) and against displays of arrogance and authority (i.e., toward social and political equality)... [Richard] Lee has eloquently described how his attempts to provide a large ox for a Christmas feast were met with scorn by the !Kung recipients, the scorn succeeding as a mechanism that prevents any tendency on the part of a good hunter or provider to become arrogant and think of himself as a "big man." The proper behavior of a !Kung hunter who has made a big kill is to speak of it in passing and in a deprecating manner; if an individual does not minimize or speak lightly of his own accomplishments, his friends and relatives will not hesitate to do it for him."^[67]

The noble savage view is therefore incomplete in many regards, as it overlooks the intense cultural demands placed upon individuals within egalitarian communities. However, this remains a testament to how the human mind is immensely elastic to the environment that it exists within. The hunter gatherer societies that early anthropologists studied and wrote about were strongly egalitarian, but their culture reflected the surrounding abundance of material and food provided by the forests and land.

Anthropologist Nurit Bird-David spoke of the hunter gatherers of Nayaka in South India, and their view of the "giving-environment" that they occupied. Competition with one another over resources in this kind of environment is confusing and alien to these kinds of hunter-gatherers, as Bird-David writes:

"Nayaka look on the forest as they do on a mother or father. For them, it is not something 'out there' that responds mechanically or passively but like a parent, it provides food unconditionally to its children. Nayaka refer, for example, to the spirits that inhabit hills, rivers, and rocks in the forest and to the spirits of their immediate forefathers alike as dod appa ('big father') and dod awa ('big mother')... They believe that dod appa and dod awa look after them and provide for their needs. If Nayaka misbehave, as parents do these spirits inflict upon them aches and pains, removing them when they express regret and promise to mend their ways; they never punish by withholding food."^[68]

The view of the noble savage should therefore not be given credence as a valid argument for change away from market economics. What we should however underline is how the human mind is rather fluid to the culture and the economic environment that surrounds it. Humans are certainly not inherently blissful, fancy-free and tranquil creatures, but similarly, we are not staunchly competitive individualists either. As always, the truth lies somewhere in between these extremes.

Evolutionarily Novel Traits

Not only is the emphasis in competition incredibly varied across a variety of societies and cultures, the manner in which humans weave competition and cooperation into their social ideology is also irksome for those who would claim an unchanging human nature.

In a divisively titled paper, *Why Liberals and Atheists Are More Intelligent*, Satoshi Kanazawa studied the proliferation of what he described as 'evolutionary novel traits'. These traits are personality characteristics which cannot readily be explained through the scope of evolutionary theory. For example, political liberalism fits this description, as proponents of liberal social policy will frequently extend sympathy to individuals that they do not personally know and have never met. This is in contrast to the evolutionary requirement to care exclusively for those who are immediately genetically related to you. Kanazawa concludes:

"[A] theory of the evolution of general intelligence, suggests that more intelligent individuals may be more likely to acquire and espouse evolutionarily novel values, such as liberalism, atheism, and, for men, sexual exclusivity, than less intelligent individuals, while general intelligence may have no effect on the acquisition and espousal of evolutionarily familiar values."^[69]

The crux of Kanazawa's argument is that general intelligence is very important in the modern economy because our experiences are generally evolutionarily novel. Most modern tasks and challenges (work, school, creativity, etc.) have no direct precedence in the simple primate societies that forged our biology, and require far more than the basic reasoning intelligence that evolution selected. As such, intelligent people excel in almost every sphere of the modern economy.

However, this brand of complex intelligence is something which was atypical within human history. Humans required basic rudimentary intelligence in order to facilitate hunting and survival skills, but they did not have much use for

abstract reasoning, complex mental arithmetic or logic. It is only now in modern society that these traits have become fully useful, and have become subject to natural selection^[69].

As such, within the bizarre landscape of modern society, traits that seem counter-intuitive in the scope of our evolutionary past, such as liberalism, sexual exclusivity and high intelligence, are actually beneficial to the complex social economy, and are hence rewarded. This is difficult to reconcile for the pro-market biological determinist, as liberalism and its egalitarian roots are demonstrably not rebellions against nature as Rothbard would claim. They are instead character traits that are actually indirectly selected by the very economy that Rothbard champions.

It is clear therefore that the ideals of liberalism and egalitarianism are not aberrations, nor are humans intrinsically hardwired to adhere to specific social systems. Instead, the chaotic interaction of genetic traits and cultural requirements gives rise to different behaviours in potentially counter-intuitive ways. Again, a difficult point to digest for those who claim unwavering competitive tendencies as human nature.

Human Evil

Competition as human nature is however not the sole argument on the lips of those who oppose social change. What of the crimes of Hitler, Stalin or Pol Pot? How can humans bring themselves to commit such atrocities against one another? Surely the presence of individuals throughout history who have done such heinous things acts as a warning that humans possess an undeniable dark side, which is some way innate to our biology.

The idea of evil is an ancient one, and it is common to rear its head when arguments against a better, more just world are posed. Evil will always exist after all, and evil will inevitably derail any attempt to create a 'utopian' ideal. But what is evil, and why do people do terrible things? Are there factors which we can alter which predictably control the occurrence of 'evil' acts, or are they simply innate to the human psyche and will emerge regardless of circumstance? These questions are what this subsection will investigate.

To peruse the most obvious and immediate examples of evil, the cells of maximum security prisons are perhaps the best starting point. Violent crime, murder, rape, and torture are actions which are almost unanimously deplored as evil by society at large. As such they are the kinds of crimes which will typically

summon the highest possible punishment in most developed nations, be that life imprisonment, or even execution in some societies.

As we have discussed in chapter 1.8, prison psychologist James Gilligan has spend over 35 years dealing first hand with those that society would view as irredeemably evil. In his role as prison psychologist, he has been frequently tasked with hyper-violent offenders who were viewed as psychopathic, remorseless and beyond reason. In a recent paper on Gilligan's work, he described his counselling of one such hyper-violent inmate:

"On one occasion, the officers in a prison had become involved in a running battle with a prisoner in which he would assault them and they would punish him. The more they punished him the more violent he became, and the more violent he became the more they punished him. They placed him in solitary confinement, deprived him of even the last few privileges and possessions a prison inmate has; there was no further punishment to which they could subject him without becoming subject to punishment themselves, and yet he continued to assault them whenever they opened his door. At that point they gave up and asked me to see if I could help them understand what was going on so they could extricate themselves from a situation that was only harming both parties to the conflict... []

[]...When I saw this prisoner I asked him, "What do you want so badly that you are willing to give up everything else in order to get it?" It seemed to me that this was exactly what he was doing. In response, this man, who was usually so inarticulate that it was difficult to get a clear answer to any question, astonished me by standing up tall, looking me in the eye, and replying with perfect clarity and a kind of simple eloquence: "Pride. Dignity. Self-esteem." And then, speaking more in his usual manner, he added "And I'll kill every motherfucker in that cell block if I have to in order to get it." He went on to describe how the officers were, he felt, attempting to strip away his last shred of dignity and self-esteem by disrespecting him, and said, "I still have my pride and I won't let them take that away from me."^[70]

Gilligan's experiences in prison cell blocks are echoed with a plethora of similar examples, yet his philosophy is continually belittled by society at large as being molycoddling and bleeding-heart liberalism. To the onlooker, criminals remain aberrations who choose to act the way they do because of evil, stupidity or

deviance. They therefore must be punished in order to deter other innately evil wrongdoers from acting upon their dark desires.

Gilligan's approach is however much more pragmatic. Once the criminal has committed the crime, the battle is over, and society must attempt to pick up the pieces as best it can. What Gilligan instead suggests is that by reducing the rates of grievance, shame, disrespect and injustice in wider society, the incidence of violence will be reduced at its source, rather than through retroactively seeking to deter potential criminals by punishing those who have already transgressed.

Interestingly enough, an increasing number of academics from various fields of study have arrived at the same explanation of the psychological roots of extreme human violence. Thomas Scheff and Suzanne Retzinger wrote that "*a particular sequence of emotions underlies all destructive aggression: shame is first evoked, which leads to rage and then violence.*"^[71]

The criminologist David Luckenbill assessed the root causes of all 70 murders that occurred in one California county, over a 10-year period between 1963 and 1972 and found that, in all cases, the murderer had resorted to violence as the only recourse to save face in a situation that he interpreted as casting doubt on his own character^[72].

The now infamous 1971 Stanford Prison Experiment by professor Philip Zimbardo also acts to partially reinforce Gilligan's arguments. In Zimbardo's experiment, a selection of individuals were assigned roles within an imaginary prison. Several were appointed as guards and several as prison inmates. The resulting experiment lasted only six days before it was abruptly cut short due to safety concerns.

During these six days, the prisoners revolted against their treatment at the hands of the guards. On the second day, a group of prisoners blockaded themselves in a room and refused to follow any further instructions. The guards doubled down on the prisoner's rebellion by employing increasingly oppressive psychological treatment.

The guards referred to the prisoners by numbers and forced them to repeat their assigned numbers on command. They employed harsh punishments for minor transgressions, including protracted exercise, humiliating prisoners by stripping them naked, forcing prisoners to sleep on the concrete floor and to defecate in a bucket placed in their cell^[73].

Zimbardo argued that the prison experiment showed the strong situational attribution of sadistic and 'evil' character traits. The circumstances within the prison, the power dynamic between the two parties, and the dehumanisation of the inmates led to a scenario where sadism emerged from human beings who were otherwise normal, well meaning members of society in their everyday lives^[73].

This tendency for circumstance to produce sadistic tendencies was further given gravity by the Abu Ghraib torture scandal in 2004, in which American soldiers manning the Iraqi prison raped, tortured, assaulted and psychologically tormented the inmates in a calculated and organised campaign. Zimbardo commented upon the similarity of the treatment with his own experiment^[74].

It must however be mentioned that Zimbardo's Stanford Prison Experiment is not without its significant criticisms. Much of this criticism has stemmed from Zimbardo's own role within the experiment as the prison warden, under the guise of which he pushed the guards to perform in cruel ways. As such, Zimbardo was not an independent observer and was actively skewing the results by his own presence and influence.

A repeat of the experiment, under much more stringently controlled circumstances, was carried out by the BBC. This experiment confirmed several of Zimbardo's conclusions, but also differed on several others. The outcome of the study was also significantly different, as by the end of the 8 day study, the prisoners emerged the stronger group, and overthrew the guards to take control of the prison. With the prisoners in charge of the prison, the group dynamic remained and the experiment collapsed into a tyranny. The study concluded:

"At one level, our study confirms the findings of the SPE [Stanford Prison Experiment]. It shows that an understanding of collective conflict and tyranny cannot be achieved simply by looking at individuals but requires an analysis of group processes and intergroup relations. In this sense, we agree with Zimbardo that such phenomena can only be explained through group-level analysis. Our disagreement with prior analysis of the SPE thus relates to the nature of group processes and of the conditions under which they lead to social pathologies.

In contrast, the results of the BBC prison study suggest that the way in which members of strong groups behave depends upon the norms and

values associated with their specific social identity and may be either anti-or prosocial.

However, based on the present data, we would argue that failing groups almost inevitably create a host of problems for their own members and for others. These problems have a deleterious impact on organization, on individuals' clinical state, and –most relevant here – on society. For it is when people cannot create a social system for themselves that they will more readily accept extreme solutions proposed by others. It is when groups lack the power to exercise choice that an authoritarian ideology that promises to create order for them appears more seductive. In short, it is the breakdown of groups and powerlessness that creates the conditions under which tyranny can triumph."^[75]

A key difference between the Zimbardo and the BBC experiments lies in the application of authority. As the study showed, the guards were free to run the prison as they saw fit, but many were reluctant to apply their authority to the fullest, for fear of becoming the oppressive guard persona.

"The issues are similar when it comes to the matter of power. It is certainly true that the guards failed to exercise power. However, this was not because they had no power to exercise but precisely because they had so much. In discussion, the guards recognized the various options that were open to them. These included individual punishments, collective punishments, removal of privileges, extra tasks and roll calls and, most particularly, the power to promote a prisoner who would help them run the system in the way they wanted. However, their fear of the guard identity – of being authoritarian and of being seen as authoritarian – made them shun these options, to promote a prisoner who embodied their ambivalence, and even to give away some of the sources of their power."^[75]

This is in direct odds to the Stanford Prison Experiment and the Abu Graib scandal, in which guards at these prisons were actively encouraged to exercise their power to the fullest extent, directly by the warden (Zimbardo) in the Stanford case, and through the high level sanctions of torture for the Abu Graib case. What is interesting here is that while the prison guards in the BBC case eschewed brandishing their authority, the new authoritarian system which emerged after the prison revolt was significantly more oppressive than the original guard-prisoner dynamic.

The strengthening of the prisoner group under the original regime led to members of this group acting with greater authoritarianism than the previous guards had. As one such former prisoner is quoted in saying; "*We want to be the guards and fucking make them toe the line, I mean on the fucking line. No fucking talking while you are eating. Get on with your food and get the fucking hell back to your cell.*"^[75]

This importance of authority and group identification in sadistic authoritarianism has been well documented in other famous experiments. In 1961, Stanley Milgram of Yale University carried out a series of experiments in which a sole participant (known as the teacher) would be fooled into believing that they were playing a word game with another participant in a separate room (known as the learner). For each question that the learner got wrong, the teacher would be instructed by the experimenter to press a button which delivered an electric shock to the learner. These electric shocks would increase from a small voltage, all the way up to a certainly fatal 450V shock.

The learner, who was in actuality an actor, and an accomplice of the experimenter, would feign groans, screams of pain, and even beg the teacher to stop by banging on the wall. The final series of shocks would result in no sound from the learner, implying to the teacher that they were unconscious or dead.

The experiment proceeded with the teacher becoming increasingly stressed, nervous and ultimately concerned for the health of the learner. With each concern the teacher rose with the experimenter, they would be firmly told to continue the experiment. Only if the teacher refused to proceed after four commands to continue would the experiment be ended.

What Milgram found is that a surprising amount of people, despite clear concerns about what they were doing, continued the experiment when prompted by the experimenter, and ultimately were coerced into killing the learner. In one of the experiments, 65% of participants delivered the fatal shock, and similar results have been repeated elsewhere. Milgram spoke of the wider ramifications of this in a 1974 article:

"The legal and philosophic aspects of obedience are of enormous importance, but they say very little about how most people behave in concrete situations. I set up a simple experiment at Yale University to test how much pain an ordinary citizen would inflict on another person simply because he was ordered to by an experimental scientist. Stark authority was pitted against the subjects' strongest moral imperatives

against hurting others, and, with the subjects' ears ringing with the screams of the victims, authority won more often than not. The extreme willingness of adults to go to almost any lengths on the command of an authority constitutes the chief finding of the study and the fact most urgently demanding explanation.

Ordinary people, simply doing their jobs, and without any particular hostility on their part, can become agents in a terrible destructive process. Moreover, even when the destructive effects of their work become patently clear, and they are asked to carry out actions incompatible with fundamental standards of morality, relatively few people have the resources needed to resist authority."^[76]

This tendency for normal, well meaning humans to be coerced by authority in order to commit heinous acts is perhaps indicative of the Stanford Prison Experiment, and its difference with the BBC prison study. The Stanford experiment was actively driven by Zimbardo to oppress the inmates as fully as possible. When combined with the in-group out-group dynamic, and the active dehumanisation of the inmates, this obedience to a malevolent authority figure led to the appalling sadism that was absent from the more freeform BBC study.

It is clear given the fertile history of experiments into this aspect of human behaviour, that sadistic behaviours that we may call 'evil' are heavily influenced by surrounding circumstances. Evil is not a human characteristic which emerges independently under any situation, indeed, even when people are placed in roles that allow them to indulge in authoritarianism, they may not necessarily engage with unseemly behaviour, as per the reluctant guards in the BBC study.

Furthermore, there is significant evidence in existence to suggest that those who are more inclined to express oppressive, anti-social or sadistic behaviours are actually suffering from serious medical conditions. In a study into conduct disorder in adolescent females (a childhood condition which can lead to anti-social behaviour disorder, and potentially violent crime) showed that all those who exhibited the disorder possessed developmental abnormalities in the dorsolateral prefrontal cortex, and the bilateral orbitofrontal cortex^[77]. Other studies have confirmed that adolescent males possess similar abnormalities in those with conduct disorder^[78].

Children with conduct disorder frequently exhibit personality traits that are overly aggressive, cold and unemotional, callous, deceitful and unempathetic. The relationship between conduct disorder and various environmental issues are

well trodden, and youth at increased risk for developing the disorder include those who have been physically abused, or exposed to prenatal alcohol abuse and smoking^[80].

Unethical and deceitful behaviour is however not solely correlated with developmental issues, or dynamic power structures. Even focusing upon certain images, ideas or concepts can detrimentally augment human behaviour in profound ways. One of the most bizarre of these is money. In a Harvard study, 324 participants were asked questions relating to their personal ethical code. Researchers then showed participants images of currency, asked them to visualise money in their mind and solve money related anagrams. According to associate professor Kristin Smith-Crowe;

"Across all of these studies we found that participants who were merely exposed to the concept of money were more likely to demonstrate unethical intentions, decisions, and behavior than participants in a control condition."^[79]

This is a profoundly interesting result, as it demonstrates how being a participant within a competitive, monetary economy can actually act to exacerbate behaviours which we may call 'evil'. To then use such occurrences of 'evil' behaviour to rationalise why alternative social structures are utopian idealism is therefore an argument which is comically erroneous.

An Immutable Human Nature

It is clear at this point that the idea of an immutable human nature which is inherently aligned with the concept of market economics is flawed. There is certainly a strong biological component which is present in the human condition, but the sheer malleability of the human mind is clear. The scientific view of evil, cooperation and competition can only conclude that these phenomena are complex interactions between social environment, developmental factors, mental health and genetic biology.

Chapter 2.2- References and Notes

- [1]. Murray N. Rothbard, *Egalitarianism As A Revolt Against Nature And Other Essays*, Second Edition, The Ludwig Von Mises Institute, 2000, Pg 8
- [2]. *Ibid* pg8-9
- [3]. *Ibid* pg6
- [4]. John von Neumann & Oskar Morgenstern, *Theory of Games and Economic Behavior*, Princeton University Press, 1944
- [5]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg119
- [6]. A. Rapoport, A. M. Chammah, *The Game of Chicken*, In; I. R Buchler, H. G. Nutini, *Game Theory in the Behavioral Sciences*, Pittsburgh University Press, pp151-175, 1969
- [7]. D. Ellsberg, *The Political Uses of Madness*, Lowell Lecture, Santa Monica California, The Rand Corporation, 1959
- [8]. Bertrand W. Russell, *Common Sense and Nuclear Warfare*, London: George Allen & Unwin, 1959
- [9]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg118
- [10]. R. D. Luce, H. Raifa, *Games and Decisions: Introduction and Critical Survey*, New York: Wiley, 1957
- [11]. A. Rapoport, A. M. Chammah, *The Game of Chicken*, In; I. R Buchler, H. G. Nutini, *Game Theory in the Behavioral Sciences*, Pittsburgh University Press, pp151-175, 1969
- [12]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg117
- [13]. C. G. McClinock, S. P. McNeel, *Prior Dyadic Experience and Monetary Reward as Determinants of Cooperative Behavior*, *Journal of Personality and Social Psychology*, 5, pp282-294, 1967
- [14]. C. Nemeth, *A critical Analysis of Research Utilizing the Prisoner's Dilemma Paradigm for the Study of Bargaining*, *Advances in Experimental Social Psychology*, 6, pp203-234, 1972
- [15]. H. Wichmann, *Effects of Isolation and Communication on Cooperation in a Two Person Game*, In; L. S. Wrightsman, J. O'Connor, N. J. Baker, *Cooperation and Competition: Readings on Mixed Motive Games*, Belmont: Brooks-Cole, pp197-205, 1972
- [16]. M. Deutsch, *Trust and Suspicion*, *Journal of Conflict Resolution*, 2, pp265-279, 1958

- [17]. H. H. Kelley, A. J. Stahelski, *Social Interaction Basis of Cooperators' and Competitors' beliefs about others*, *Journal of Personality and Social Psychology*, 16, pp66-91, 1970
- [18]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg129
- [19]. D. T. Miller, J. G. Holmes, *The Role of Situational Restrictiveness on Self-Fulfilling Prophecies: A Theoretical and Empirical Extension of Kelley and Stahelski's Triangle Hypothesis*, *Journal of Personality and Social Psychology*, 31, pp661-673, (1975)
- [20]. D. M. Kuhlmann, D. L. Wimberley, *Expectations of Choice Behavior held by Cooperators, Competitors and Individualists across Four Classes of Experimental Game*, *Journal of Personality and Social Psychology*, 16, pp66-91, (1976)
- [21]. R. M. Dawes, *The Commons Dilemma Game: An n-Person Mixed Motive Game with a Dominating Strategy for Defection*, *Oregon Research Institute Research Bulletin*, 13(2) (1973)
- [22]. H. Hamburger, *N-Person Prisoner's Dilemma*, *Journal of Mathematical Sociology*, 3, pp27-48, (1973)
- [23]. T. C. Schelling, *Hockey Helmets, Concealed Weapons, and Daylight Saving: A Study of Binary Choices with Externalities*, *Journal of Conflict Resolution*, 17, pp381-428, (1973)
- [24]. Garrett Hardin, *The Tragedy of the Commons*, *Science*, 13 December 1968: Vol. 162 no. 3859 pp. 1243-1248
- [25]. G. N. Appell, *Hardin's Myth of the Commons: The Tragedy of Conceptual Confusions*. Working Paper 8. Phillips, ME: Social Transformation and Adaptation Research Institute, 1993
- [26]. Terry L. Anderson, Donald R. Leal, *Free Market Environmentalism*, Palgrave MacMillan (Revised Edition), 2012
- [27]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg132
- [28]. G. Marwell, D. Schmidt, *Cooperation in a Three Person Prisoner's Dilemma*, *Journal of Personality and Social Psychology*, 21, pp376-383, (1972)
- [29]. H. Hamburger, M. Guyer, J. Fox, *Group Size and Cooperation*, *Journal of Conflict Resolution*, 19, pp503-531, (1975)
- [30]. J. Fox, M. Guyer, *Group Size and Others' Strategy in an n-Person Game*, *Journal of Conflict Resolution*, 21, pp323-338, 1977
- [31]. J. Fox, M. Guyer, *'Public' Choice and Cooperation in n-Person Prisoner's Dilemma*, *Journal of Conflict Resolution*, 22, pp469-481, 1978

- [32]. M. D. Caldwell, *Communication and Sex Effects in a Five Person Prisoner's Dilemma Game*, Journal of Personality and Social Psychology, 33, pp273-280, 1976
- [33]. D. G. Rand, J. D. Greene, M. A. Nowak, *Spontaneous giving and calculated greed*, Nature, 2012 Sep 20;489(7416)pp427-430
- [34]. Margaret Mead, *Cooperation and Competition Among Primitive Peoples* (2002 edition), New York and London: McGraw-Hill (Originally published 1937)
- [35]. E. M. Thomas, *The Harmless People*, London: Readers Union and Secker and Warberg, 1960
- [36]. C. M. Turnbull, *The Forest People*, London: The Reprint Society of London, 1963
- [37]. C. M. Turnbull, *Wayward Servants*, London: Eyre and Spottiswoode, 1965
- [38]. Andrew M. Colman, *Cooperation and Competition in Humans and Animals*, Van Nostrand Reinhold, 1982, pg252
- [39]. H. Kuper, *An African Aristocracy*, London: Oxford University Press for the International African Institute, 1947
- [40]. H. Kuper, *The Swazi*, London: International African Institute, 1952
- [41]. H. Kuper, *The Swazi: A South African Kingdom*, New York: Holt, Rinehart and Winston, 1964
- [42]. M. G. Marwick, *Sorcery in its Social Setting: A Study of the Northern Rhodesian Chewa*, Manchester: Manchester University Press, 1965
- [43]. R. F. Barton, *Ifugao Law*, Berkeley and Los Angeles: University of California Press, 1969,
- [44]. R. F. Barton, *The Halfway Sun*, New York: AMS Press, 1977
- [45]. E. A. Hoebel, *The Law of Primitive Man*, Cambridge, Mass.: Harvard University Press, 1954
- [46]. R. F. Barton, *The Kalingas: Their Institutions and Custom Law*, Chicago: University of Chicago Press, 1949
- [47]. E. R. Leach, *Political Systems of Highland Burma*, London: G. Bell and Sons, 1954
- [48]. Colin M. Turnbull, *The Mountain People*, Touchstone, 1987
- [49]. Bernd Heine, *The Mountain People: Some Notes on the Iik of North-Eastern Uganda*. Africa: Journal of the International African Institute, Vol. 55, No. 1, 1985, pp. 3–16
- [50]. R. L. Munroe, R. H. Munroe, *Cooperation and Competition Among East African and American Children*, Journal of Social Psychology, 101, pp145-146, 1977

- [51]. A. Shapira, M. C. Madsen, *Cooperative and Competitive Behavior of Kibbutz and Urban Children in Israel*, *Child Development*, 40, pp609-617, 1969
- [52]. A. Shapira, *Developmental Differences in Competitive Behavior of Kibbutz and City Children*, *Journal of Social Psychology*, 98, pp19-126, 1976
- [53]. M. C. Madsen, A. Shapira, *Cooperative and Challenge in Four Cultures*, *Journal of Social Psychology*, 102, pp189-195, 1977
- [54]. M. C. Madsen, *Cooperative and Competitive Motivation of Children in Three Mexican Subcultures*, *Psychological Reports*, 20, pp1307-1320, 1967
- [55]. M. C. Madsen, A. Shapira, *Cooperative and Competitive Behavior of Urban Afro-American, Anglo-American, Mexican-American and Mexican Village Children*, *Developmental Psychology*, 3, pp16-20, 1970
- [56]. M. C. Madsen, *Developmental and Cross-Cultural Differences in the Cooperative and Competitive Behavior of Young Children*, *Journal of Cross-Cultural Psychology*, 2, pp365-371, 1971
- [57]. S. Kagan, M. C. Madsen, *Cooperation and Competition of Mexican, Mexican-American and Anglo-American Children of Two Ages Under Four Instructional Sets*, *Developmental Psychology*, 6, pp32-39, 1971
- [58]. B. F. Meeker, *An Experimental Study of Cooperation and Competition in West Africa*, *International Journal of Psychology*, 5, pp11-19, 1970
- [59]. D. W. Bethlehem, *Cooperation, Competition and Altruism Among School-children in Zambia*, *International Journal of Psychology*, 8, pp125-135, 1973
- [60]. E. A. Sommerlad, W. P. Bellingham, *Cooperation-Competition: A Comparison of Australian European and Aboriginal Children*, *Journal of Cross-Cultural Psychology*, 3, pp149-157, 1972
- [61]. D. R. Thomas, *Cooperation and Competition Among Polynesian and European Children*, *Child Development*, 46, pp948-953, 1975
- [62]. D. E. Stannard, *American Holocaust: Columbus and the Conquest of the New World*, New York: Oxford University Press, 1992
- [63]. P. Bellwood, *First Farmers: The Origins of Agricultural Societies*, Oxford: Blackwell Publishing, 2005
- [64]. S. Bowles, *Conflict: Altruism's midwife*. *Nature*, 456, 2008, pp326-327; S. Bowles, *Did Warfare Among Ancestral Hunter-Gatherers*

- Affect the Evolution of Human Social Behaviors?* Science, 324, 2009, pp1293-1298
- [65]. J.K. Choi, S. Bowles, *The Coevolution of Parochial Altruism and War*. Science, 318, 2007, pp636-640.
- [66]. Nicolas Peterson, *Demand Sharing: Reciprocity and the Pressure for Generosity among Foragers*, American Anthropologist, 95(4):860-874, 1993
- [67]. E. A. Cashdan, *Egalitarianism among Hunters and Gatherers*. American Anthropologist, 82(1), 1980, pp116-120
- [68]. N. Bird-David, *The Giving Environment: Another Perspective on the Economic System of Gatherer-Hunters*. Current Anthropology, 31(2), 1990, pp189-196
- [69]. Satoshi Kanazawa, *Why Liberals and Atheists Are More Intelligent*, Social Psychology Quarterly, Vol. 73, No. 1, pp33-57
- [70]. James Gilligan, *Shame, Guilt, and Violence*, Social Research, Vol. 70, No. 4, Shame (winter 2003), pp. 1149-118
- [71]. Thomas J. Scheff, Suzanne M. Retzinger, *Emotions and Violence: Shame and Rage in Destructive Conflicts*, iUniverse, 2001, pg3
- [72]. D. F. Luckenbill, *Criminal homicide as a situated transaction*. Social Problems, 25, pp176-186, 1977
- [73]. Philip Zimbardo, *The Lucifer Effect: How Good People Turn Evil*, Rider, 2008
- [74]. Melissa Dittmann, *What makes good people do bad things?* American Psychological Association, Monitor on Psychology, October 2004, Vol 35, No. 9, pg68
- [75]. Stephen Reicher, S. Alexander Haslam, *Rethinking the psychology of tyranny: The BBC prison study*, British Journal of Social Psychology (2006), 45, 1-40
- [76]. Stanley Milgram, *The Perils of Obedience*, Harper's Magazine, 1974
- [77]. G. Fairchild et al, *Brain structure abnormalities in adolescent girls with conduct disorder*, J Child Psychol Psychiatry. 2013 Jan;54(1):86-95
- [78]. G. Fairchild et al, *Brain Structure Abnormalities in Early-Onset and Adolescent-Onset Conduct Disorder*, American Journal of Psychiatry, Volume 168 Issue 6, June 2011, pp. 624-633
- [79]. *Just thinking about money can corrupt you*, CNN (New York) 17 Jun 2013 - <http://money.cnn.com/2013/06/17/pf/money-corrupt/index.html>

- [80]. J. Murray, D. P. Farrington, *Risk factors for conduct disorder and delinquency: Key findings from longitudinal studies*. The Canadian Journal of Psychiatry, 55 (10), 2010, pp633-642, also; C. A Larkby, L. Goldschmidt, B. H. Hanusa, & N. L. Day, *Prenatal alcohol exposure is associated with conduct disorder in adolescence: Findings from a birth cohort*. Journal of American Academy of Child and Adolescent Psychiatry, 50(3), 2011, pp262-271

2.3 Incentive

IF THE SUPPOSEDLY COMPETITIVE and insidious prerogatives of human nature are the most common objections to a transition away from market economics, the question of incentive and impetus is certainly close behind them. To many, a world without traditional, regimented workplaces based upon market principles is one which will inevitably lead to mass stagnation and an epidemic of laziness or complacency. To many, waged labour under conventional market currencies is viewed as an incentive mechanism which cannot realistically be bettered.

This line of argument is common, and the literature of market economics is rich with it. The market system of incentives is considered the optimum method with which to coax inherently lazy and self interested humans into contributing something worthwhile to society. In its absence, no such contribution will be made, as nothing tangible is gained by the individual.

British philosopher and political economist John Stuart Mill was a firm proponent of this view as far back as the 1800s. In his 1848 work, *The Principles of Political Economy*, Mill critiqued the socialist system of government and economics based upon its lack of competitive incentive;

"It is the common error of Socialists to overlook the natural indolence of mankind; their tendency to be passive, to be the slaves of habit, to persist indefinitely in a course once chosen. Let them once attain any state of existence which they consider tolerable, and the danger to be apprehended is that they will thenceforth stagnate; will not exert themselves to improve, and by letting their faculties rust, will lose even the energy required to preserve them from deterioration. Competition may not be the best conceivable stimulus, but it is at present a necessary one, and no one can foresee the time when it will not be indispensable to progress."^[1]

Mill is however certainly not alone in this view. Scores of economists, philosophers and politicians, both living and dead, have echoed similar views. The incentive of competition for individual monetary gain remains a powerful force in government policy and in argumentative resistance to transition away from the traditional marketplace.

However, in recent years, cracks have been beginning to appear in this vast edifice of behavioural theory. The dawn of the internet has allowed near instantaneous communication between people from different corners of the globe. This increased interconnectivity was initially just one of many useful quirks of the internet, but a far more powerful application of this has recently brought about a quiet internet based revolution. This has become known as Web 2.0.

The New Web

Web 2.0 is a collective medium in which users and developers coalesce into one single entity, creating an environment which has been dubbed by journalist Tim O'Reilly as the "Read/Write" culture^[2]. This culture revolves around user centred design, in which users collectively design and develop for the mutual good of their shared resultant product, or artistic trend. Online within the modern internet, it is incredibly difficult to not stumble across a Web 2.0 style site simply because they are so ubiquitous. Web blogs, wiki pages, social networking sites, video and photography sharing sites, etc are all large parts of the web as we know it, yet they all adhere to the read/write philosophy.

Critics of the Web 2.0 movement however do exist. Many have dismissed it as an overhyped, overused buzzword with very little actual meaning, while others have gone so far to say that it is a threat to the integrity of our creative culture. It has been argued by Andrew Keen in his polemic *Cult of the Amateur* that this phenomenon has led to a sea of mediocrity being freely available, based on the assumption that all content is to be considered equal^[3]. It is claimed that this content equality has led to the opinions and analysis of the uneducated to become largely indistinguishable from professionally developed content.

The web based model of content propagation however operates in a very similar manner to the conventional market model when scrutinised. In a traditional marketplace, products are created and provided to the public, where they are perused, purchased and thus indirectly ranked by popular opinion on the basis of sales.

This is no different on the internet, as poor quality content is recognised as such and inevitably sinks below the more popular. The only difference here is that the measure of quality or popularity is based upon direct popularity itself, rather than popularity via purchasing. The web is not a place where low quality material can pass through the filter any more than it can in the conventional marketplace.

Open Source and Technical Systems

Alongside Web 2.0, technical collaborative models have also emerged to provide empirical information, services or products to the economy. The communal encyclopaedia known as Wikipedia has become the staple of this trend. Growing from humble beginnings in 2001 to a gargantuan internet presence today, it boasts over 3.5 million articles in English alone as of time of writing.

Elsewhere on the internet, other wiki pages are growing in parallel, collecting knowledge regarding fiction and non-fiction alike. A similar meteoric rise to fame has become true of the Mozilla open source brand since its inception in 1998. Mozilla's Firefox browser currently holds 30% of the market share of internet browsers (Figure 2.3-1), second only to Microsoft's Internet Explorer. Such success of the product in part led to the incorporation of Mozilla Corp in 2005, which the not-for-profit foundation owns wholly as a subsidiary. The corporation manages the Mozilla Foundation's interactions with businesses and financial funding, despite the design of the products still being entirely the responsibility of the free open source community.

However, Mozilla is not alone in this new open source world which the internet has helped to sculpt. The dominance of free, open source computer operating systems, beyond the desktop realm of Windows or Apple, is a trend that is largely unknown to the general public. Linux ran 91% of the top 500 supercomputers in June of 2010 (Figure 2.3-2).

In September 2008, Linux was said to also be running 60% of all internet servers by Microsoft CEO Steve Ballmer^[5]. Even the universal symbol of human scientific prowess that is the Large Hadron Collider is currently running on Linux^[6]. In addition, a plethora of companies, governments and facilities also rely on this operating system on a day to day basis.

The Linux based Android operating system for use in smartphone and tablet devices is also becoming somewhat of a success story. It has been estimated that in the 4th quarter of 2010, Android smartphones represented 33% of the global

smartphone shipments^[8]. This made the Google owned Android system the market leader for mobile phone applications, ahead of competitors such as Symbian (Nokia) and iOS (Apple).

Usage Share of Web Browsers - Dec 2010

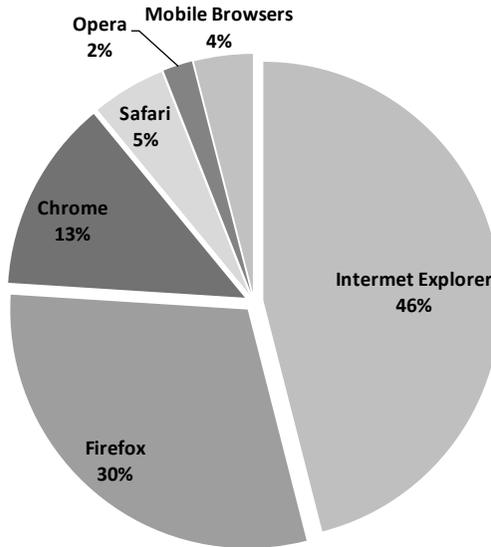


Figure 2.3-1 - Share of Browser usage - Adapted by author from [4]

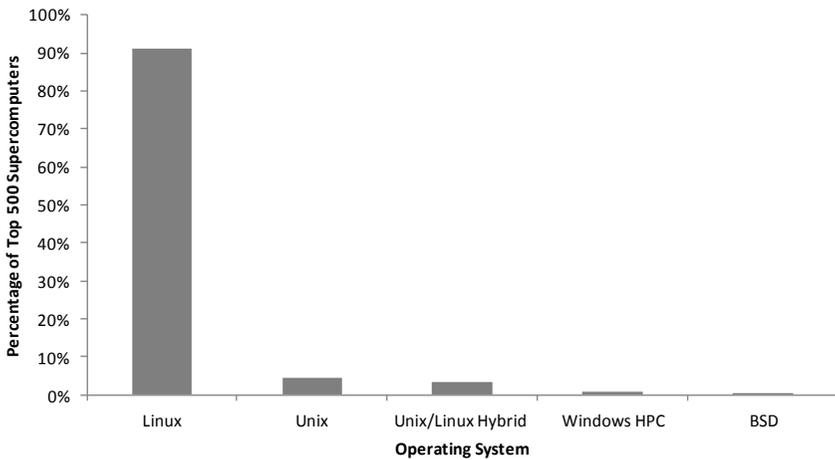


Figure 2.3-2 - Operating systems amongst top 500 supercomputers - Plotted by author from [7]

It seems that the open source, open collaboration model of user centred development is becoming somewhat commonplace in our modern economy. But the question must be pondered as to why so many professional institutions and corporations rely on these free pieces of software, and why so much of the general population relies on wiki style pages to obtain everyday information. Is it simply because they are free and easy to access or obtain?

In a 2006 Library Journal article, the factual accuracy of Wikipedia was assessed under great scrutiny throughout all fields of study. The article concluded:

“It is difficult to characterize the caliber of the site because there is so much variation. Despite its flaws, however, Wikipedia should not be dismissed. Although the writing is not exceptional, good content abounds. It is encouraging that some Wikipedians have attempted to organize the writing and impose a standard format through various WikiProjects devoted to specific areas of science such as biology, chemistry, mathematics, medicine, and physics.”^[9]

A further analysis in 2006 by the Nature Publishing Group, an international publisher of scientific journals concluded that the factual accuracy of scientific articles on Wikipedia “comes close” to that of the professionally compiled Encyclopaedia Britannica^[10], a claim which Britannica disputed^[11], but was vigorously defended by Nature^[12].

As for the open source software creations, the tests for quality and performance can be much more empirical. In December 2010, the popular technology web blog Lifehacker.com carried out controlled experiments in order to review the performance of internet browsers against each other. It was found that the latest Firefox came in fifth out of the tested browsers.

While this may seem underwhelming, it must be considered that it and all others massively outperformed the professionally developed, market leading browser, Internet Explorer. The aggregate test results are shown in Table 2.3-1. It was generally found that the Firefox browsers were slower to start, but much more memory efficient.

It is clear that Firefox is not embarrassingly inadequate in comparison to its more commercial and professionally minded counterparts. For this reason, it cannot be said that its success is due to its availability as a free resource, indeed all other browsers which it is pitted against are also free to obtain. The power of

an open source community to create a useful and popular tool can therefore not be dismissed as simply a matter of cost here either.

Browser	Score
Chrome 10 (Canary)	72.5%
Opera 10	71.4%
Chrome 8 (Stable)	70.0%
Opera 11 beta	62.5%
Firefox 4 beta 7	52.5%
Firefox 3.6.13	52.5%
Internet Explorer 9 beta	45.7%

Table 2.3-1: General performance scores of various browsers - Taken from [13]

With regard to Linux, it is difficult to not find praise for it in comparison to its competitors. A 2008 article in The Economist praised the Linux based “Gutsy Gibbon” (Ubuntu) system;

“Your correspondent has been happily using Gutsy Gibbon on a ten-year-old desktop with only 128 megabytes of RAM and a tiny 10 gigabyte hard-drive. When Michael Dell, the boss of Dell Computers, runs Ubuntu on one of his home systems, Linux is clearly doing many things right.”^[14]

While it is true that governments have often switched to Linux systems as a response to cost cutting pressures, the advantages of Linux over desktop market leader Windows in the realms of security, stability, fragmentation, longevity and integrity are widely acknowledged. Indeed in a leaked internal email by Bill Gates, the Microsoft founder commented that:

“Our most potent Operating System competitor is Linux and the phenomena around Open Source and free software. The same phenomena [sic] fuels competitors to all of our products. The ease of picking up Linux to learn it or to modify some piece of it is very attractive. The academic community, start up companies, foreign governments and many other constituencies are putting their best work into Linux. Although we cannot make Windows free for commercial use we can do dramatically more to make it accessible including parts of the source code”^[15]

It is clear that cost is not the critical factor which affects the popularity of Linux. This is further echoed in China, where analyst Christopher Dawson noted in

2009 that the usage of Ubuntu (a desktop variant of Linux) is growing despite widespread piracy which essentially renders Windows available for free^[16]. This growth in adoption can only be attributed to genuine popularity rather than a matter of expense. It seems quite conclusive that the Cult of the Amateur of which Andrew Keen spoke is not inherently linked with poor quality.

It seems that the open source development philosophy is not a minnow in a pond of larger professional fish, but instead produces products on at least equal footing with its competitors in most cases. We have thusly stumbled upon the crux of this chapter; as we must consider why these open source developers are contributing high quality products, which are competitive with equivalent corporate products, seemingly out of the goodness of their hearts.

Web 2.0 and Open Source in the Greater Context

So what does all this information have to do with the absence of market incentive in a society? Well firstly, what economic theory can explain the trends which have just been analysed? It is clear that people all over the world are contributing on a fairly grand scale to products and projects which are of at least equal quality to their professionally funded rivals. However, they are doing so in complete isolation from any kind of financial gain mechanism. Two decades ago, to predict that a freely accessible online encyclopaedia, written by a loose band of volunteer amateurs, would sink Microsoft's professionally funded Encarta would be dismissed as madness.

These trends toward volunteer based open source work seem to amount to economic heresy, but strangely to the scientific community this represents relatively old news. A great many studies have been made into human behaviour in the presence of incentives, and there is a strong consensus in almost all literature on this topic over the course of six decades. The findings all echo the same mantra; in most cases financial rewards actually lead to worse performance and less creativity.

This consensus is particularly counter-intuitive to a society which thrives on gratification by waged employment, cash bonuses for high performance, graded salary reviews and pay rises alongside promotions. Yet despite the wealth of knowledge to the contrary, economic theory seems to remain resolutely rigid when confronted. In science it has been clear for some time that beyond a threshold level, rising remuneration fails to deliver greater performance or interest, yet we seem to keep barking up that tree as if something will change this fact.

This however only explains half of the story. All it tells us is that financial incentive is not a particularly effective way of encouraging contribution, contrary to popular belief. It however does not tell us what form of incentive does work, and what we can do to encourage contribution in a more effective manner.

It is clear that the hordes of volunteers propping up Wikipedia, coding within Firefox or Linux, or contributing to other complex developments have already found their drive and are exploiting it to the full. If financial incentives are not what drive people like the open source community, or the Web 2.0 crowd, then what does?

The Third Drive

Most readers will be fairly awestruck by the bold claim of the previous subsection. It is difficult to fathom quite how financial incentive can be detrimental to our impetus in any way at all. This seems fundamentally at odds with almost every assumption underpinning the concept of a waged labour market. However, before we get to this claim, and in order to fully understand what makes people contribute to complex and challenging projects absent from financial gain, it is prudent to first examine the basic drives which govern our motivation.

Understandably, a biological drive is the most basic and rawest of human motivators. It is the application of mind and body in order to achieve something which is vital to survival. This may be food, water, warmth, shelter, a sexual partner, or general comfort in day to day life. The biological drive however is a basic and brutish beast, and does not foster nuanced social or interpersonal skills. As such, with the increasing complexity and interdependence of human culture, a second drive developed amongst our cliques of social primates, which supplemented and supported our blunt biological motivations.

The second human drive arose as a method of controlling or guiding social behaviour, by implementation of a punishment or reward. Simply put: punish the bad, reward the good. This basic dogma has been built upon and tweaked over the course of centuries by such names as Taylor and Maslow, but in essence remains the same today; offer somebody with a suitable reward and they will be suitably motivated to do something. Daniel Pink refers to these two broad methods of motivation as Motivation 1.0 (biologically based) and Motivation 2.0 (reward based).^[17]

Things really start to get interesting when we move beyond these two fairly primal drives and into the world of the third drive. In contrast to its counterparts,

the third drive is not extrinsic, i.e. it does not stem from external stimulus. The third drive does not extrinsically encourage a person in the same way that a loaf of bread extrinsically stimulates a starving man, or a handful of coins extrinsically stimulates an impoverished labourer. The third drive is quite different to this, but no less powerful.

In 1949, American psychologist Harry Harlow began an experiment with eight rhesus lab monkeys. The experiment involved the solution of a simple puzzle in which the monkeys were required to unlatch a series of locks in the correct combination. Harlow discovered that almost as soon as the monkeys had been introduced to the environment, without any outside influence they began to solve the puzzles of their own volition. Furthermore, the monkeys became quite adept at solving the puzzle within a relatively short timescale, and their times to complete the puzzle began to progressively reduce.

Harlow was understandably fairly baffled by this unexpected turn of events, he writes that: “*solution [of the puzzle] did not lead to food, water or sex gratification.*”^[18] This observation led Harlow to posit that there may be a tertiary drive along with the more obvious biological and reward seeking tendencies. More interestingly, this drive was intrinsic rather than extrinsic. Harlow dubbed this phenomenon intrinsic motivation – a motivation from within the individual simply due to the intrinsic pleasure of the task.

Harlow continued the study, implementing raisins as rewards for task completion in order to assess their effect. Counter intuitively, the introduction of raisins as a reward for solving the puzzle led to monkeys performing more poorly than they did in the absence of a reward. This was a discovery which once again stumped Harlow, as it suggested not only that intrinsic motivation existed, but that it “*may be as basic and strong*”^[18] as the more well known drives.

It is easy to dismiss this 60 year old experiment with small lab monkeys as one which is not representative of much higher level human motivation, or perhaps even one that represents some kind of anomaly, but it would be incredibly unwise to do so. The reason why this experiment is important is that it laid the foundations for innumerable studies which consistently reinforce its basic principal; that there is a powerful intrinsic third drive, and that in most cases implementation of rewards stifles our ability to capitalise upon it.

In 1969, Edward L. Deci, now Professor of Psychology at Rochester University conducted an experiment into intrinsic motivation with human volunteers. The

experiment involved the volunteers solving a Soma puzzle cube; a seven piece, three dimensional puzzle with many possible shape combinations. A typical Soma puzzle cube is shown in Figure 2.3-3.

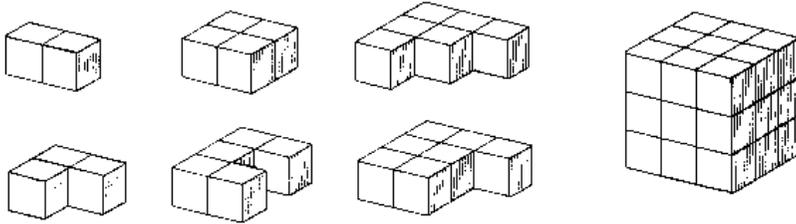


Figure 2.3-3 - Soma Puzzle Cube Example

The volunteers were divided into two groups of equal number; the experimental group and the control group. In a series of one on one sessions, volunteers would be led into a room with a puzzle cube and an assortment of magazines for a period of one hour. Deci would present the volunteer with a shape combination, and measure the time taken to replicate the shape from the puzzle parts. Each volunteer would repeat the one hour test three times over three days, with differing incentives across the groups as follows:

Experimental Group

- Day One – No Reward
- Day Two – \$1 for each successful completion
- Day Three – No Reward

Control Group

- Day One – No Reward
- Day Two – No Reward
- Day Three – No Reward

After the volunteer had completed two puzzles in a session, Deci would pause the session and leave the room to log the results, leaving the volunteer alone with the puzzle parts and the picture of the third shape. Deci however was not logging results; he was observing the subject from next-door. For eight minutes Deci observed whether the subject would try to get a head start on the third shape, or whether they would simply read the magazines on the table. What he observed is as follows.

Day One

There was no significant difference between groups due to identical incentives. Participants from both groups played with the third shape for approximately four of the eight unsupervised minutes.

Day Two

The incentivised experimental group became very interested in solving the third puzzle and spent just over five of the eight minutes trying to solve it. The control group performed similarly to day one.

Day Three

The experimental group played with the puzzle for only three minutes, while the control group played for over four minutes.

Deci confirmed what Harlow had observed in rhesus monkeys some two decades earlier; that there is an intrinsic motivation which is stifled when contingent incentives are offered. He wrote; *“when money is used as an external reward for some activity, the subjects lose intrinsic interest for the activity.”*^[19]

Daniel Pink, author of New York Times bestseller, *Drive* called this stifling of motivation when money is offered for it as ‘The Sawyer Effect’^[21], based upon the lesson taught by Ben in Mark Twain's *The Adventures of Tom Sawyer*, that payment for play turns it into work. As quoted so eloquently by Twain:

“There are wealthy gentlemen in England who drive four horse passenger coaches twenty or thirty miles on a daily line, in the summer, because the privilege costs them considerable money; but if they were offered wages for the service, that would turn it into work and they would resign.”^[20]

A further experiment into the subject was carried out by Professors Mark Lepper and David Greene in the late 1970s. The team selected children who liked to spend their time drawing; the children were then split into three groups. The first group was offered a certificate if they drew something, while the second group were given a surprise certificate upon completion. The third group were not rewarded, simply asked if they wanted to draw something.

Two weeks later, the researchers returned and the experiment was repeated; only this time, no rewards were offered to any of the children. It was found that the group which received no reward, and the group which received the surprise reward drew with just as much enthusiasm as before. The previously rewarded group however showed significantly less interest in the pastime and spent less time drawing than any of the other children^[22].

This experiment is important in revealing what specific kinds of stimuli affect motivation. Children who were offered certificates as a contingent reward - 'if you do this, then you will get that' - saw their motivation eroded when the contingent reward was removed. Children who were rewarded by surprise did not see a reduction in their motivation, but crucially also saw no motivational benefits when compared to the children who were not rewarded at all.

In 1999 Deci carried out a comparative study in order to collate the findings of a wide range of studies into the mysterious intrinsic motivation phenomenon, he stated that;

“careful consideration of reward effects reported in 128 experiments lead to the conclusions that tangible rewards tend to have a substantially negative effect on intrinsic motivation.”^[23]

The evidence here seems to reflect a firm scientific consensus amongst the literature.

Performance

The 128 studies perused by Deci confirm that Harlow's rhesus monkeys were not performing in an abnormal manner back in 1949. It is patently clear from the evidence that we, like the rhesus monkeys, possess an instinctual interest for activity. However, it adds little tangible to the activity merely by being interested. We are not paid to be interested in our work; we are paid to do it, and do it to the best of our ability. If rewards sap interest, how do they interact with our ability to perform?

In order to assess the effects, four economists were dispatched to India in order to undertake a study on behalf of the U.S. Federal Reserve. The study was to determine the true effects of a reward mechanism on performance. Eighty seven participants were selected and tasked with a series of simple puzzles which tested a combination of reasoning, memory recall and creative thinking. Once again, the selection was divided into three groups, with rewards as follows:

Group One

Rewarded with one day's pay

Group Two

Rewarded with two weeks' pay

Group Three

Rewarded with five months' pay

Despite the fairly large incentive difference between them, groups one and two were observed to perform similarly. However, the most counter intuitive result of this study is that the group rewarded with five month's worth of pay came last in all but one experiment:

"In eight of the nine tasks we examined across the three experiments, higher incentives led to worse performance."^[24]

In addition to this, the London School of Economics hosted their own meta-analysis, in which they analysed 51 studies into corporate pay-for-performance plans. Their findings were in a similar vein:

"...financial incentives... can result in a negative impact on overall performance."^[25]

This set of outcomes seems particularly unusual. While the relationship between conditional reward and interest in a task is counter intuitive, the phenomenon can be rationalised quite easily through an understanding of the third drive. However the inverse relationship between contingent rewards and level of performance is more difficult to understand.

It seems that contingent rewards narrow our view and focus our attention on the outcome rather than the process. This perhaps allows us a quick burst of short term impetus, however the standard of the work done is of aggregate poorer quality. The reason for this is because we are not entirely doing it for the sake of the outcome; we are doing it for the reward contingent on the outcome.

Creativity

This poorer quality of performance under reward contingency leads to a further implication; the stifling of creativity. This is heavily interlinked with the concept

of performance and quality as previously investigated, however it creates a distinction between two varieties of tasks, as we will see.

Figure 2.3-4 shows the candle problem as devised by Karl Duncker in the 1930s. This problem involves using the items shown (a cardboard box, a candle, some drawing pins and a pack of matches) in order to attach the candle to the wall, not letting any wax drip onto the table. The twist to the candle problem is that it can be presented in two ways; with the drawing pins in the cardboard box, or in a pile on the table next to the box.

The lower frame of Figure 2.3-4 shows the candle problem in its solved form. The key here is the role of the cardboard box. When the problem is presented as scenario A, the box is not immediately obvious as a tool for solution of the puzzle, as it is simply used to hold the pins. When the pins are removed from the box as in scenario B, the puzzle becomes much more straightforward, as it is clear that now the box serves a purpose other than as a container.

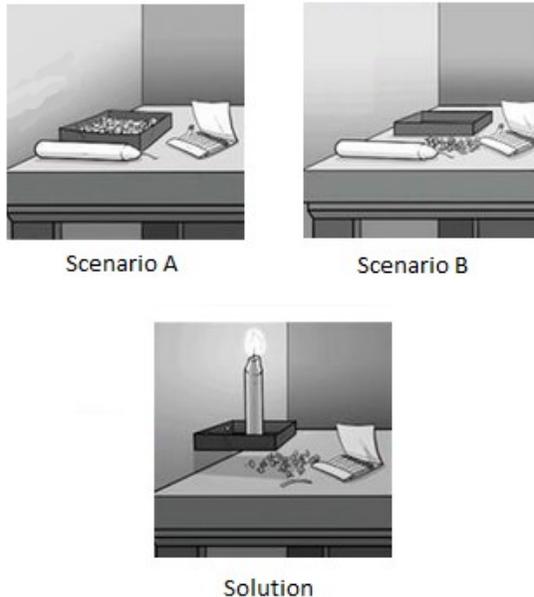


Figure 2.3-4: Karl Duncker's Candle Problem - From [26]

This creates essentially two completely different tasks; scenario A is inherently heuristic (based around creativity and thinking beyond the box's 'functional

fixedness') while scenario B is more algorithmic (as the parts of the puzzle are all immediately obvious, it is merely mechanically putting them together in a logical way).

In the 1960s, psychologist Sam Glucksberg used these two scenarios of the candle problem to see how our ability to 'think outside the box' alters in the presence of an extrinsic incentive. Once again, an experimental (reward) group and a control (no reward) group set up was adopted. The volunteers in the experimental group were offered rewards ranging from \$5 to \$20 based on a sliding scale of best times to completion.

It was found that when the puzzle was presented as in scenario B, the incentive led to the intuitively predicted result; the puzzle was solved significantly faster by the paid experimental group. However, the roles reversed when the box was presented merely as a receptacle as in scenario A. In the more creativity oriented variety of the puzzle, the incentivised group on average took about three and a half minutes longer than the average of the non rewarded group^[27].

This juxtaposition between simplistic and more abstract reasoning skills under external incentives is an interesting one, but it is also consistently predictable within the literature. Professor Teresa Amabile of the Entrepreneurial Management Unit at Harvard Business School carried out a study into intrinsic motivation involving twenty three artists.

A group of art critics were assembled and asked to assess the quality of a selection of ten commissioned works and ten non-commissioned works. Commissioned here essentially means that the artist was paid to paint a piece by a client, rather than painting a piece and selling afterwards. The consensus of the panel of critics was described by Amabile;

"commissioned works were rated as significantly less creative than the non-commission works, yet they were not rated as different in technical quality."^[28]

The agreement amongst the critics was also surprisingly echoed by the artists, who said they felt constrained by commissions, instead feeling more creative and motivated when working on pieces free from financial concern^[28].

In the 1960s, a further study was carried out amongst students in the School of Art Institute of Chicago. This study assessed prevalence of external and intrinsic factors during the students courses, making distinctions between monetary and

artistic motivations. The same students were then re-assessed in the 1980s in order to assess the extent to which they had succeeded or failed in the industry. Considering the length of time involved in this study, the findings were remarkable; the author writes:

“The less evidence of extrinsic motivation during art school, the more success in professional art both several years... and nearly twenty years after.”^[29]

In addition to this, the students who had relied less on extrinsic motivators “*have produced art which has been socially recognised as superior*”^[29]

Why is it that not only performance but also creativity are sapped by the usage of tangible, financial rewards? It seems that the reward causes our view to become narrower to set focus on the task, hence the positive implication of rewards with straightforward, mechanical processes.

However, creativity is something quite apart from focus. It is something which requires a broader and less conventional manner of approach. In a scenario where our task cannot be focused into a narrow range of possibilities, the presence of a reward perhaps blinkers out the unconventional and abstract methods of reasoning which are often vital for effective progress.

It must be stressed that creativity is not just limited to artists and puzzles; creativity represents the backbone of all technological, scientific and research-based work. But this area in no way holds the monopoly on creative, non-routine and heuristic processes. In a recent study by the global management consultancy McKinsey and Company, it was shown that there was a 30:70 split of algorithmic to heuristic work in the modern U.S. economy^[30]. The importance of creativity to modern humanity must therefore not be underestimated. It must be cherished and encouraged through every outlet in order to produce cutting edge technology and artistic cultural character alike.

Behaviour

We have thus far perused the adequacy of rewards as an effective motivation method; however it seems rational to also look at the other side of the coin. How do humans typically interact with tangible punishments, such as monetary fines? In order to assess this method of deterrent, economists Uri Gneezy and Aldo Rustichini devised a study for 20 weeks in 2000 from a child day care centre in Israel.

The centre had pre-existing rules which were unchanged by the study; it was open 7:30 - 16:00. It was widely known in the community that any parent picking a child up later than closing time would result in a childminder having to stay late in order to ensure the child's safety. Despite this, there remained a relatively low background rate of latecomers.

After the 4th week of observation, the economists imposed a fine for parents who collected their children late in order to assess the effect on the average background rate of latecomers. It seems obvious that by hitting the parents in the pockets, the fine would encourage the rate of latecomers to fall to an absolute minimum. However the intrinsic nature of the third drive never seems to act in the direction that intuition suspects. Gneezy and Rustichini wrote:

“After the introduction of the fine, we saw a steady increase in the number of parents coming late.”^[31]

Not only does the rate go up, but it goes up significantly, eventually settling “...at a level that was... almost twice as large as the initial one.”^[31] Once again the third drive seems to elude our commonly held notions of human behaviour. Not only does a financial punishment seem to be ineffective, but an altruistic motivation to spare someone of hardship seems to override it.

It seems that when a fine is levied, people see it as if they are paying for their wrongdoing. So long as they have capacity to pay, the third party will be adequately recompensed for their hardship. In the eyes of the unperturbed third drive however, it seems that a latent moral obligation to stick to an agreement works more effectively, perhaps due to the guilt of the third party being put out without any recompense.

Not only does altruism seem to dominate behavioural decision making in the presence of a fine, proactive altruism also seems to be the dominant driver for those who do good. In an experiment by Swedish economists, the effect of payment for people who were interested in donating blood was observed. Just over 150 women who were considering giving blood were split into three groups, and offered various rewards for their donation. The results of the experiment are shown in Table 2.3-2.

Group	Payment	Percentage of group who agreed to donate blood
One	No reward	52%
Two	50 Kroner	30%
Three	50 Kroner (charity)	53%

Table 2.3-2 - Results of Swedish Experiment into altruism amongst blood donors - Adapted by author from [32]

Again, it seems like the incentive to do altruistic deeds is inherently intrinsic and is stifled by financial incentives. Of particular interest here is the outcome of group three, which performed as well as the no reward group. Group three were given the choice to donate their reward to charity rather than keep it, and performed far better than those who kept their reward. It appears that the contribution of a financial reward to an otherwise voluntary act of goodwill taints the natural feeling of satisfaction associated with the deed.

Honesty and propensity to cheat is also an aspect of human behaviour in which financial incentives do not work as intuitively expected. Behavioural economist Dan Ariely has studied this field through many entertaining experiments, including a 2008 study into a maths test. Subjects were initially asked to fill out a preliminary paper in which they either listed as many of the ten commandments as they could recall, or listed as many childhood books as they could recall. The participants would then sit an exam of 20 simple maths questions, carried out under an unrealistically tight timescale.

At the end of the test, participants were instructed to shred their exam papers and self-report how many questions they answered on a separate piece of paper. For each question that the participant claimed to have answered, they would be awarded a small amount of money.

The results showed that students who were made to think about the ten commandments prior to the test claimed to have solved fewer questions than those who had listed their favourite childhood books. Not only was the reduction in cheating significant, participants' average declared performance amongst the ten commandment group was indistinguishable from another group whose tests were formally checked by an external examiner^[33].

Ariely's reasoning behind this phenomenon is that the higher self-awareness brought about by reciting a moral code before the test was powerful enough to diminish dishonesty almost completely. This effect was strong enough to

override the propensity to lie, despite the fact that lying participants would be financially rewarded without repercussions. The effect is also apparent when participants were asked to sign a non-binding honour code before beginning the test. Again, in these cases cheating and lying was essentially eliminated^[34].

These effects are all well documented, but counter intuitive to the layperson. Our intuitions are however quite accurate when looking at the morality behind financial incentives. Studies conclusively agree that usage of financial incentives help to trigger fundamentally immoral behaviour when applied in the long term.

Think of the short term boost to motivation which we considered earlier during the children's drawing experiment. In the modern economy, we are subject to a constant supply of short term incentive boosts which are set externally and contingent upon some long term or on-going goal. The goal could be as rudimentary as not losing your job, or it could be something along the lines of achieving a certain level of performance, delivering a successful product or attaining a pre-defined amount of economic growth.

While in the short term, the incentive may seem superficially prudent to ensure co-ordinated direction towards the goal, the long term repercussions of this crude motivation is problematic. A study by a group of economists from Harvard Business School, and various other esteemed universities found that;

“Substantial evidence demonstrates that in addition to motivating constructive effort, goal setting can lead to unethical behaviour.”^[35]

The desperation to deliver a long term goal based on shorter term reward incentives can be seen all around us. It is fundamental to the nature of waged labour, and is hardwired into the corporate culture of personal development. Yet the application of a salary as a contingent reward for delivering against goals is flawed. Not only does contingent goal setting lead to unethical behaviour, the usage of contingent rewards also fosters a dependency upon those rewards, which has profound psychological effects.

The Reward Addiction

Anton Suvorov, Assistant Professor of Economics at the Russian New Economics School has proposed that the mechanism of rewards constitutes what he calls a principal-agent theory. The principal-agent theory is based on two affecters; the principal (rewarder) and the agent (rewardee).

Suvorov posits that once an agent has given a contingent reward for completion of a task, the reward must be at least sustained in order to attain a similar level of

behaviour. Eventually, it is probable that the principal must increase it in order to retain the same level of interest for the agent. Suvorov went on to distribute a paper in 2003 entitled *Addiction to Rewards*, exploring this phenomenon. He writes:

“Rewards are addictive in that once offered, a contingent reward makes an agent expect it whenever a similar task is faced...”^[36]

Brian Knutson of the National Institute on Alcohol Abuse and Alcoholism contributed a neurological attribute to this observation by utilising MRI technology. Subjects were given a game to play which mimicked the chance to win money, while the MRI machine recorded their neurological activity. It was found that dopamine was secreted into the nucleus accumbens when a player anticipated a victory. This is significant as the nucleus accumbens is a part of the brain which is associated with addiction. Experiments in which patients are given nicotine, cocaine and amphetamines show similar rushes of dopamine to the nucleus accumbens, resulting in a brief rush of pleasure which subsequently recedes, demanding a further dose^[37].

Knutson notes that addicts are prone to making less rational decisions than those without a dependency; hence it logically follows that when under the incentive of a reward, we are similarly disadvantaged. Our latent neurological addiction to rewards leads us to similarly ineffective and irrational decisions. This in many ways gives a more biological explanation to the reason why we have seen worsening performance with contingent rewards across the board. Our addiction to rewards gives us a reduced capacity for reasoning and effective decision making when under the influence of one, allowing simplistic tasks to be adequately completed, but leaving us lacking in high end thought processes for more creative tasks, or when attempting to perform.

Dissecting the Third Drive

The previous subsections of this chapter, based on the work of countless economists, psychologists and sociologists confirms within any reasonable doubt that there is a form of intrinsic motivation which is potent and relevant. However we have yet to pin down what this motivation is, and what actually nurtures and enables it. Modern management techniques stand to learn a great deal from the study of this inner drive, and how to encourage it; therefore it is important to consider why we do what we seem to do.

The culmination of Deci and Ryan’s study into human motivation is the Self Determination Theory^[38] (SDT), which states that the third drive breaks down

into three loose categories which must all be encouraged in order to attain the full potential of intrinsic motivation. These are:

- A sense of autonomy and control over how to work.
- A satisfying progression towards improvement and mastery.
- A sense of purpose in one's work and what it means.

Similarly, the esteemed Hungarian Professor of psychology, Mihaly Csikszentmihalyi emphasises the importance of something which he calls 'flow' when capitalising upon intrinsic motivation. Csikszentmihalyi's ideal of flow comes from discussion with numerous artists, designers, scientists and others who have spoken of a mindset in which the subject becomes seemingly lost in their work, as productivity soars and significant progress is made.

Figure 2.3-5 shows a diagram of how flow is located in terms of skill and challenge level. This viewpoint is consistent with SDT, as it acknowledges the importance of competence towards mastery, and a recognisable purpose in work.

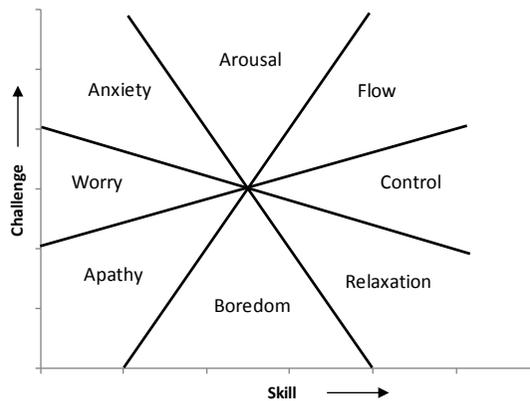


Figure 2.3-5 - Mihaly Csikszentmihalyi's representation of 'flow' - Taken from [39]

Perhaps the most interesting approach which has been adopted within our current system to nurture these requirements is the Results Only Work Environment (ROWE). Developed by former human resources experts Cali Ressler and Jody Thompson, the ROWE is a work philosophy in which only what the employee delivers is of interest to the management; the manner of work (providing it is ethical and legal) and the hours which the employee work are irrelevant so long as results are produced^[40].

Such a work philosophy has been adopted by American behemoths like Best Buy and Gap to good effect. Tamara Erickson wrote in the Harvard Business Review that Best Buy's productivity rose by 35% upon implementation of a ROWE, and employees widely expressed better relationships with family and friends^[41]. Other firms such as Australian software company Atlassian demonstrated the power of this work environment in different ways.

Atlassian initially offered one day per quarter in which employees were permitted to work on anything they desired and submitted the results the next day. These 'FedEx' days as they became known (as employees 'had to deliver overnight') generated such a plethora of new products, patches and bug fixes, that the management subsequently allowed 20% of the employees' time to be dedicated to completely autonomous working. The unprecedented success of this experiment led to Atlassian implementing a full ROWE^[42].

Elsewhere, at software giant Google, a similar process called '20% time' operates. Half of Google's newest products or services are now dreamed up and developed during this freeform 20% time, such as Google News and Google Talk^[43]. I could go on naming firms which have incorporated similar schemes to great effect, but the point has become obvious enough. Allowing people to determine their own work schedule, to proactively improve their competency and understanding, and to work with purpose opens up intrinsic motivation and productivity in ways that traditional contingent financial motivation simply cannot hope to achieve.

The Market Incentive?

Not forgetting why we set out upon this exploration of the human mind; we must inevitably return to our discussion of social direction and resolve the concerns raised. The question we posed at the opening of the chapter still needs to be answered with some level of confidence. Without a market based incentive system, will we descend into a vicious spiral of laziness and complacency?

Interestingly, looking into the human psychology of rewards, we seem to have unearthed a further item strongly in favour of the proposed direction, rather than a stumbling block. As the modern job market skews further towards non-linear, complex tasks and away from mechanistic or repetitive labour, it seems that financial incentive becomes less of a help than it is conventionally portrayed.

The self interested human who looks to achieve personal gain from every transaction or contribution seems to have been deeply misunderstood. After all this, the typical human just wants to do something, to get better at it, to decide

when to do it and to work towards a purposeful end. Provided that basic biological requirements are catered for, it seems that the human mind will proactively seek motivation towards some form of activity or contribution.

Therein lies the defining reason why today we see the self interest principle seemingly dominating the behaviour of humans worldwide. Their biological needs are categorically not being catered for. They are working because they need money to survive, not because money is needed to inspire incentive.

Modern money is a survival mechanism. It is a manner of sustaining ourselves and our family within our current economic model. Any extrinsic motivation which it provides in addition to this service is distinctly secondary; one must be able to pay the bills before one sets out to solve any grand problem. However, the addictive nature of reward has convinced us otherwise. We are adamant that we are hopelessly dependent upon monetary reward for our creativity and impetus. That is a deeply sorry state to be in, and it is an insult to the many great minds who have contributed in absence of the profit motive.

It is abundantly clear that the self interested human cog, who integrates so nicely into the economic machine we have created, is a gross oversimplification of what we are. More important perhaps than the factual nature of this epiphany is its proliferation into the population. We remain surrounded by management principles which instil attitudes and values in opposition to the vast body of scientific study. As Daniel Pink puts it, *“organizations... still operate from assumptions about human potential and individual performance that are outdated, unexamined, and rooted more in folklore than in science.”*^[44]

These misplaced values are what breeds our artificial dependence on money for incentive; a latent hatred toward anyone perceived as not “pulling their weight” in our collective struggle; and a quiet self deprecating portrayal of humanity as needing constant coercion and authority to accomplish anything.

Are we to ignore the wealth of scientific study to the contrary in light of these interpretive observations from within the economic machine? Or are we to accept that monetary reward is just not as important as we may think it is? The answer seems obvious. Transcend the market as a biological imperative to survival, and incentive will come in ways which we have never seen before, from places we have never imagined.

Chapter 2.3- References and Notes

- [1]. John Stuart Mills, *Principles of Political Economy and Chapters on Socialism*, Book IV - Influence of Progress, Oxford Paperbacks; Reprint edition, 2008, pg157
- [2]. Richard MacManus, *Tim O'Reilly Interview, Part 1: Web 2.0*, ReadWrite, Nov 15, 2004
- [3]. Andrew Keen, *The Cult of the Amateur: How blogs, MySpace, YouTube, and the rest of today's user-generated media are destroying our economy, our culture, and our values*, Doubleday, 2008
- [4]. Data taken from Stat Counter - <http://gs.statcounter.com/#desktop-browser-ww-monthly-200807-201507>
- [5]. Caitlyn Martin, *Debunking the 1% Myth*, O'Reilly, 7 September, 2010
- [6]. Steven J. Vaughan-Nichols, *High-Energy Linux: Linux & the Large Hadron Collider*, 7 Dec 2009 - <http://www.computerworld.com/article/2468248/high-performance-computing/high-energy-linux--linux--the-large-hadron-collider.html>
- [7]. Joey-Elijah Sneddon, *Linux powers 91% of the worlds top supercomputers*, May 31, 2010
- [8]. Tarmo Virki, Sinead Carew, *Google topples Nokia from smartphones top spot*, Reuters, Jan 31, 2011 - <http://uk.reuters.com/article/2011/01/31/oukin-uk-google-nokia-idUKTRE70U1YT20110131>
- [9]. Barry X. Miller, Karl Helicher, & Teresa Berry, *I Want My Wikipedia!* Library Journal, April 1, 2006 - <http://lj.libraryjournal.com/2006/04/technology/i-want-my-wikipedia/>
- [10]. Jim Giles, *Special Report: Internet encyclopaedias go head to head*, Nature 438, 900-901 (15 December 2005)
- [11]. *Fatally Flawed: Refuting the recent study on encyclopedic accuracy by the journal Nature*, Encyclopædia Britannica, Inc. March 2006
- [12]. *Encyclopaedia Britannica and Nature: a response*, 23 March 2006
- [13]. Kevin Purdy, *Browser Speed Tests: IE 9 Beta, Firefox 4 Beta, Chrome's Crankshaft, and Opera 11 Beta*, Lifehacker, 10 Dec 2010 - <http://lifehacker.com/5711040/browser-speed-tests-ie-9-firefox-4-beta-chromes-crankshaft-and-opera-11-beta>
- [14]. *Technology in 2008: Three fearless predictions*, The Economist, Dec 23rd 2007 - http://www.economist.com/node/10410912?story_id=10410912

- [15]. Email: From: Bill Gates, To: Senior Leadership Team, *Subject: Software Agenda* - January 04 2001
- [16]. Christopher Dawson, *Ubuntu a minor player? Not outside the States*. ZDNet, 17 June 2009 - <http://www.zdnet.com/article/ubuntu-a-minor-player-not-outside-the-states>
- [17]. Daniel H. Pink, *Drive: The Surprising Truth About What Motivates Us*, Canongate Books, 2011, pg18
- [18]. Harry F. Harlow, Margaret Kuene Harlow, Donald R Meyer, *Learning Motivated by a Manipulation Drive*, Journal of Experimental Psychology 40, pp231-234, 1950
- [19]. Edward L. Deci, *Effects of Externally Mediated Rewards on Intrinsic Motivation*, Journal of Personality and Social Psychology, 18, pg114, 1971
- [20]. Mark Twain, *The Adventures of Tom Sawyer*, New York: Oxford University Press, 1998, pg23
- [21]. Daniel H. Pink, *Drive: The Surprising Truth About What Motivates Us*, Canongate Books, 2011, pg36
- [22]. Mark Lepper, David Greene, Robert Nisbett, *Undermining Children's Intrinsic Interest with Extrinsic Rewards: A test of the Overjustification Hypothesis*, Journal of Personality and Social Psychology, 28, no.1, pp129-137, 1973
- [23]. Edward L. Deci, Richard M. Ryan, Richard Koestner, *A Meta Analytic Review of Experiments Examining the Effects of Extrinsic Rewards on Intrinsic Motivation*, Psychological Bulletin, 125, no. 6, pg659, 1999
- [24]. Dan Ariely, Uri Gneezy, George Lowenstein, Nina Mazar, *Large Stakes and Big Mistakes*, Federal Reserve Bank of Boston Working Paper, no 5-11, 2005
- [25]. *LSE: When Performance Related Pay Backfires*, Financial, June 25, 2009
- [26]. Karl Duncker, *On Problem Solving*. Psychological Monographs 58. American Psychological Association, 1945
- [27]. S. Glucksberg, *The influence of strength of drive on functional fixedness and perceptual recognition*. Journal of Experimental Psychology 63: 36-41, 1962
- [28]. T. M. Amabile, E. Phillips, and M. A. Collins. *Person and Environment in Talent Development: The Case of Creativity*. In Talent Development: Proceedings of the 1993 Henry B. and Jocelyn Wallace National Research Symposium on Talent Development,

- edited by Nicholas Colangelo, Susan G. Assouline, and DeAnn L. Ambrosion. Unionville, NY: Trillium Press, 1994
- [29]. Jean Kathryn Carney, *Intrinsic Motivation and Artistic Success*, University of Chicago, Department of Behavioral Sciences, Committee on Human Development., 1986
- [30]. Bradford C. Johnson, James M. Manyika, Lareina A. Yee, *The Next Revolution in Interaction*, McKinsey Quarterly 4, pp25-26, 2004
- [31]. Uri Gneezy, Aldo Rustichini, *A Fine is a Price*, Journal of Legal Studies, 29, January 2000
- [32]. C. Mellström, M. Johannesson, *Crowding Out in Blood Donation: Was Titmuss Right?*. Journal of the European Economic Association, 6: pp845–863, 2008
- [33]. Nina Mazar, On Amir, Dan Ariely, *The Dishonesty of Honest People: A Theory of Self-Concept Maintenance*, Journal of Marketing Research, Vol. 45, No. 6, pp. 633-644, 2008
- [34]. Nina Mazar, Dan Ariely, *Dishonesty in Everyday Life and Its Policy Implications*, Journal of Public Policy & Marketing, Vol. 25 (1) Spring 2006, 1–000
- [35]. L. D. Ordóñez, M. E. Schweitzer, A. D. Galinsky, M. H. Bazerman, *Goals Gone Wild: The Systematic Side Effects of Overprescribing Goal Setting*, Academy of Management Perspectives, 23(3), 82-87, 2009
- [36]. Anton Suvorov, *Addiction to Rewards*, June 2013. Available at SSRN: <http://ssrn.com/abstract=2308624a>
- [37]. B. Knutson, C.M. Adams, G.W. Fong, D. Hommer, *Anticipation of increasing monetary reward selectively recruits nucleus accumbens*, J Neurosci. 2001 Aug 15;21(16)
- [38]. E. Deci, R. Ryan, *Handbook of self-determination research*. Rochester, NY: University of Rochester Press, 2002
- [39]. Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience*, Harper Perennial Modern Classics, 2008
- [40]. Cali Ressler, Jody Thompson, *Why Work Sucks and How to Fix It: The Results-Only Revolution*, Portfolio; Reprint edition, 2010
- [41]. Tamara Erickson, *Task Not Time: Profile of a Gen Y Job*, Harvard Business Review, February 2008
- [42]. Daniel H. Pink, *Drive: The Surprising Truth About What Motivates Us*, Canongate Books, 2011, pp92-94
- [43]. *Ibid* pg 96
- [44]. *Ibid* pg9

2.4 A Racial Worldview

WITHIN SOCIAL DEBATE, difference between people is a powerful driver of demagoguery. Political parties that have seduced the electorate with tales of interlopers from foreign lands are too ubiquitous to mention. Within this dialogue, a further cop-out argument from the defenders of the status quo emerges; how can a peaceful and prosperous global society exist when such vast differences exist between people and cultures?

Granted, this argument is often spouted with slightly darker intentions than defence of the current market system, but it is still none-the-less a protestation which is wheeled out in defence of a tiered, hierarchical world, and with some regularity.

The politically minded National Socialists and the white supremacists strangely find some support amongst the ranks of free-market proponents, amongst the most strident of such is of course our beloved Murray Rothbard, who argued with some conviction as to how the difference between races is a "*truly lethal blow*" to the "*left-egalitarian blackout-and-smear gang*"^[1]. In his writings on social policy, when discussing the link between race and intelligence, he writes:

"If, then, the Race Question is really a problem for statist and not for paleos, why should we talk about the race matter at all? Why should it be a political concern for us; why not leave the issue entirely to the scientists?"

Two reasons we have already mentioned; to celebrate the victory of freedom of inquiry and of truth for its own sake; and a bullet through the heart of the egalitarian-socialist project. But there is a third reason as well: as a powerful defense of the results of the free market. If and when we as populists and libertarians abolish the welfare state in all of its aspects, and property rights and the free market shall be triumphant once more, many individuals and groups will predictably not like the end result. In that case, those ethnic and other groups who might be

concentrated in lower-income or less prestigious occupations, guided by their socialistic mentors, will predictably raise the cry that free-market capitalism is evil and "discriminatory" and that therefore collectivism is needed to redress the balance. In that case, the intelligence argument will become useful to defend the market economy and the free society from ignorant or self-serving attacks. In short; racist science is properly not an act of aggression or a cover for oppression of one group over another, but, on the contrary, an operation in defense of private property against assaults by aggressors."^[2]

The free market again is viewed as the meritocratic arbiter of social justice, and any distribution of races across the income hierarchy must intrinsically reflect the merit of these people. Those who become "*concentrated in lower income or less prestigious*" roles within society are there because they do not offer society as much as those in the higher income, higher prestige occupations.

There are obvious issues with this line of reasoning, most pertinently equating the more highly remunerated occupation with the most prestigious or socially beneficial. The conflation of equality of opportunity with equality of outcome also rears its ugly head, however we have discussed these fallacies sufficiently in chapter 1.8. What is of specific interest here is the latter part of Rothbard's statement. This argument is that the inherent genetic inequality between disparate people is justification for the inequity in society, and any attempt to redress this balance is fundamentally an act of aggression, and an ignorance of reality.

Understandably, within a topic so charged and heated, controversy abounds. Almost no scientist who has ventured into the wailing caverns of racial traits has emerged unscathed by accusation and scandal. Those who present evidence for IQ correlating with race are tarred as racist and hateful, while those who counter such claims are labelled as politically correct apologists.

The controversy here is of no interest or use to anyone, however the honest and factual outcome to this study is of grave and eminent importance when building a world upon science and consensus. It is all too often that those who ascribe to a racially centric identity will claim that a segregated and tiered world must always exist, due to the inherent difference in individual races. Similarly, supporters of multiculturalism argue the exact opposite - that mobility and racial diversity is important and beneficial. Which of these, if any, are true?

The Bell Curve

Distribution of intelligence across society generally follows what is described as a normal distribution. Within this distribution, the bulk of people cluster around the average, with progressively diminishing quantities as we move further away from the average. Due to the shape of the resulting graph, the normal distribution has been dubbed the 'bell curve', which also would become the title of Murray and Herrnstein's seminal 1994 book, *The Bell Curve: Intelligence and Class Structure in American Life*.

This book, despite its relatively dry, scientific tone, would go on to be one of the most discussed and controversial publications of all time. *The Bell Curve* featured broad assessments of intelligence across society, with a small portion of the work discussing the differences among racial groups. Of this small portion, an even smaller portion dealt with possible genetic influences on those differences. However despite race being a small subset of the analysis contained in *The Bell Curve*, the section of the book describing differences in average racial intelligence has summoned immense discussion, including several books written to debunk or discredit its conclusions. In particular, the graph which rustled the most feathers is shown in Figure 2.4-1.

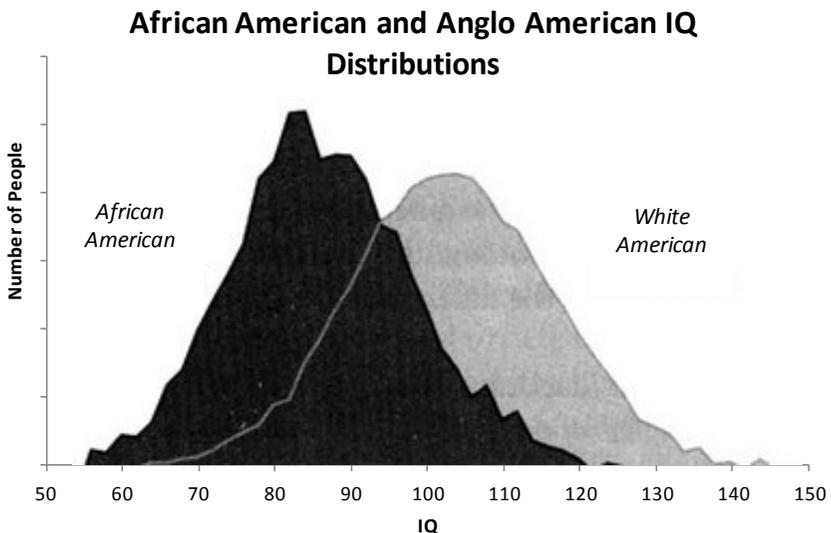


Figure 2.4-1: The 'bell curve' of IQ distribution for American citizens of African (black) and European (white) origin - Adapted by author from [3]

As shown, the 'black' bell curve distribution of IQ averages at around 85 points, while the 'white' curve averages at around 100. This however is not an anomaly,

and has been verified multiple times by studies unrelated to the authors of *The Bell Curve*. In 1998, Brookings published an article discussing the test score gap, and broadly concurs with the IQ distribution.

"African Americans score lower than European Americans on vocabulary, reading, and math tests, as well as on tests that claim to measure scholastic aptitude and intelligence. The gap appears before children enter kindergarten and it persists into adulthood. It has narrowed since 1970, but the typical American black still scores below 75 percent of American whites on almost every standardized test. This statistic does not imply, of course, that all blacks score below all whites. There is a lot of overlap between the two groups. Nonetheless, the test score gap is large enough to have significant social and economic consequences."^[4]

At this point in time, there is little argument as to the existence of a gap between black and white student intelligence in terms of test scores, but argument still rages over whether these observations are a result of some inherent difference between races, or due to differences in the environment. Furthermore, this argument has boiled over into the very concepts of race and intelligence, and whether any meaningful correlation can actually be made between two ill-defined characteristics, let alone whether a correlation between the two has any meaning in the first place. Hold on; it is going to get bumpy.

Measureable Intelligence

The study of race versus intelligence is not only mired in controversy, it is also nebulously defined and notoriously hard to empirically correlate. Both the terms "intelligence" and "race" have been subject to significant debate as to what they actually mean, and how is best to objectively measure them.

The nature of intelligence has long been discussed, and numerous interpretations currently exist. A 1995 report, *Intelligence: Knowns and Unknowns*, published by the American Psychological Association offers a concise summary of the consensus view on human intelligence:

"Individuals differ from one another in their ability to understand complex ideas, to adapt effectively to the environment, to learn from experience, to engage in various forms of reasoning, to overcome obstacles by taking thought. Although these individual differences can be substantial, they are never entirely consistent: a given person's intellectual performance will vary on different occasions, in different

domains, as judged by different criteria. Concepts of "intelligence" are attempts to clarify and organize this complex set of phenomena. Although considerable clarity has been achieved in some areas, no such conceptualization has yet answered all the important questions, and none commands universal assent. Indeed, when two dozen prominent theorists were recently asked to define intelligence, they gave two dozen, somewhat different, definitions."^[5]

The divide between scientists typically lies along the line of multiple, largely independent intelligences, and a single, immutable intelligence which governs all cognitive function. Proponents of the single intelligence argue that biological functions in the brain directly govern intelligence, giving all humans some basic general intelligence factor (known as *g*). Evidence for this view is found in the strong correlation between basic reaction time tests and IQ.

Jensen (1993) stated that "*the most obvious hypothesis is that speed of information processing is the essential basis of g, and one possible neurological basis of speed of processing is the speed of transmission through nerve pathways*"^[6]. Consequently, this argument posits that an individual's neural processing speed can be shown to determine the level of intelligence of the individual; this intelligence is the one general intelligence, *g*.

A further argument in favour of a single, measurable intelligence is the correlation that can be shown between cognitive tests of different types. This proposal is very old indeed, as Spearman (1904), administered a variety of different psychometric tests to participants, covering several different areas of cognitive ability. It was found that there was a positive correlation between the test results for each participant. For example, individuals who performed well on verbal based tests would also typically perform well on mathematics or general problem solving tests^[7].

Supporters of multiple intelligences however are more varied in their views, and few fully agree on how each separate intelligence can be classified or measured. For instance, Gardner's theory of multiple intelligences posits that there are seven forms of intelligence. These are linguistic, musical, spatial, bodily, interpersonal, intrapersonal and logico-mathematical^[8].

Li (1996) summarizes Gardner's theory based upon the compartmental functionality of the brain; neuroscience and MRI technology has shown us that various different forms of cognitive function are correlated with different areas

of the brain. Damage or abnormality in these specific areas can lead to erosion of certain cognitive abilities while leaving others intact^[9].

Gardner's theory therefore has a fairly strong biological basis, and his study of individuals who had speech impairment, dyslexia or motor control issues allowed him to approximately localise the parts of the brain that were needed to perform each function. He studied the brains of people with disabilities postmortem and found that there was damage in specific areas, in comparison to those who did not have a disability in that particular aspect of cognitive functionality^[10].

Gardner's multiple intelligences theory criticised the idea of the general intelligence factor, as he hypothesised that formal psychometric tests only really assessed the verbal, logical, and spatial aspects of intelligence, despite purporting to assess the full spectrum of human ability. He argued that the more subjective intelligences, such as athleticism, musical creativity, and social awareness were not included^[11].

Sternberg's triarchic theory of intelligence built upon Gardner's in that it takes into account creative or musical intelligence, but went on to classify the remaining intelligences into analytic (or academic) and practical categories. Sternberg defined analytic intelligence as pertaining to problems that have been formulated by other people, are clearly defined, come with all the required information needed to solve them, have only a single right answer, which can be reached by only a single method, are disembodied from ordinary experience, and have little or no intrinsic interest.

He defined practical intelligence as pertaining to problems which require recognition and formulation, are poorly defined, require information seeking, have various acceptable solutions, are embedded in and require prior everyday experience, and require motivation and personal involvement^[12].

Sternberg's theory has shown impressive robustness in real-life situations. For example, Carraher, Carraher, & Schliemann (1985) observed that Brazilian street children can typically solve the mathematical problems required in order to run their street businesses, but they are unable to pass simplistic mathematics classes in school.^[13]

It is clear therefore that there is some variety to human intelligence, but the correlation between general intelligence and basic reaction times cannot be fully ruled out. This issue is complex and a hard conclusion is not going to be

possible, but what is clear is that the human mind is not readily rankable by intrinsic merit in the manner that Rothbard and other market apologists would suggest.

Definition of 'Race'

The waters further muddy when approaching the idea of race, which to the layperson may seem relatively straightforward. The genetic concept of race is also fairly hotly contested, with some scientists dismissing the colloquial concepts of race (e.g. 'black', 'white', 'asian', etc.) as entirely socially constructed groups with no basis in actual biology.

The standard scientific representation of ancestry is known as the haplogroup, which is a grouping of similar DNA types based upon inherited lineage. There are a broad variety of haplogroups, which largely agree with general racial descent. A world map of haplogroups is shown in Figure 2.4-3.



Figure 2.4-2: World map of haplogroups for illustrative purposes - Adapted by author from [14]

What is important here is that haplogroups generally concur with the ancestral genetic ancestry of a group of people, but within multicultural societies, haplogroups begin to fall down in their correlation with race. For example in North America, individuals who would be typically seen as 'hispanic' or 'African-American' may have significantly different genetic makeup to others who would identify under the same racial banner.

In a large sample study of haplogroups in the United States, Mitchell et al wrote in 2014:

"Mitochondrial haplogroup classification was highly concordant with self-identified race/ethnicity (SIRE) in non-Hispanic whites (94.8 %), but was considerably lower in admixed populations including non-Hispanic blacks (88.3 %), Mexican Americans (81.8 %), and other Hispanics (61.6 %), suggesting SIRE does not accurately reflect maternal genetic ancestry, particularly in populations with greater proportions of admixture."^[15]

But this discrepancy between race and haplogroup is just the beginning of a long story. Anthropologist C. Loring Brace observed that the variations between humans are distributed along geographic gradients or clines^[16]. For example, starting in Northern Europe, and heading south towards Africa will show an average gradual darkening of skin tone over distance, but it would be challenging to pinpoint the moment when 'white' ended and 'black' began. This trait is therefore shown to vary gradually based upon environmental surroundings.

This point signals a problem with the common descriptors for race (skin colour, hair colour etc.) as the variation over these clines tends to result in a host of other genetic similarities and differences that do not correlate highly with the colloquial markers for race. Anthropologist Frank Livingstone argued that because these changes in genetic markers are gradual across geographic distance, and that a variety of genetic markers cross colloquial 'race' boundaries, the concept of race was invalid, and clines are the only realistic description of human variation^[17].

Ukrainian evolutionary biologist Theodosius Dobzhansky partially agreed with Livingstone that discrete, objective races did not exist, but went on to argue that biological differences along the cline can be described in terms of racial differences between two disparate populations^[18].

On the other side of the fence, many have argued passionately for the existence of discrete human races, based upon the reliability of self-reporting. Race studies into human intelligence traditionally categorised participants based upon self-reports (i.e. 'what race would you describe yourself as?'), rather than studious analysis of genetic characteristics.

Despite this seemingly lackadaisical approach, self-identification of race remains a surprisingly reliable guide to genetic makeup. Tang et al. (2005) used a mathematical clustering analysis of genomic markers for over 3,600 people in the United States and Taiwan, based upon the question of whether they identified as 'white', 'black', 'East Asian', or 'Latino'. It was found that there was a very high level of agreement between cluster assignment and participants' self-identification^[19].

The accuracy of these self-reports in comparison to genetic clustering is however somewhat controversial. According to psychologist David Rowe, self identification is used to define participants' racial backgrounds because this method of classification encompasses the "*cultural, behavioral, sociological, psychological, and epidemiological variables*" that distinguish racial groups^[20].

For instance, native Africans and African Americans share fairly similar genetic markers, but indigenous Africans differ significantly in their cultural and religious backgrounds, as well as lacking the historical perspective of being a marginalised minority in a primarily white society. Clustering based solely on genetics would miss these environmental nuances.

C. Loring Brace^[21] and geneticist Joseph Graves also argue against the correlation between clusters and self identification as a proof of race. By asking to define self reports within traditional colloquial race boundaries, analysts falsely confer meaning upon the clustering of races. However, if participants are cued to self identify based upon other means (i.e. continent of origin, country of origin, etc.) then the clustering still occurs, simply based upon a different set of genetic boundaries^[22].

Earl B. Hunt largely agrees that race in the colloquial sense holds little meaning, rather arguing that what we typically refer to as race (i.e. skin colour, differences in features etc.) are in fact correlative features rather than deterministic features. The underlying genetic characteristics which lead to IQ differences between people are too, the causes of differences in what we describe as 'race'. Race as we know it is not the driving variable, but instead an additional variation^[23].

The quagmire opens before us, as little in this field is clear cut. What is clear is that humans do genetically vary across a wide variety of traits, and do seem to cluster together approximately in groups of similar ancestry, but these variations are not as simplistic as the traditional notions of 'black' or 'white' racial background. Irrespective, these differences must be understood if we are to address Rothbard's argument in favour of intrinsic human inequality.

Genetic Determinist vs. Environmentalist Arguments

With the confusing definitions of race and intelligence, one would think that the arguments for genetic heritability and environmental influence would be more clear cut. You would be wrong. On both sides of the debate, there remains highly politicised discussion as to whether intelligence between people of different racial backgrounds is dependent upon genetics or environment.

As always, the actual reality lies between these two extremes. Intelligence in terms of IQ test results is generally considered to be very heritable. However, high heritability in terms of genetics is calculated based upon a simple correlation between observed traits and genes. Due to the complex interactions between genes and environmental factors, a correlation does not adequately describe the causes of heritability, which may be either genetic or environmental.

Therefore, a high heritability measure does not imply that a trait is inherently genetic or, crucially, unchangeable. However, as environmental factors that affect all group members equally will not be measured by heritability, the observed heritability of a trait may also change over time in response to changes in the distribution of genes and environmental factors^[24].

This is underlined by the fact that within populations, 30–50% of differences in IQ test scores in childhood is attributable to genetics, increasing to 75–80% by late adolescence^{[24][25]}. That is, the genetic influence on intelligence changes over time. Haworth has suggested that as children grow up, they increasingly select, modify and even create their own experiences in part based on their genetic propensities, thus seeking environments that reinforce their own genetic makeup^[26].

With the influence of environment so crucial to even heritable genetic traits, we must pose the question whether colloquially defined racial groups can be shown to be influenced by different environmental factors that account for the observed differences between them. Jensen has argued that given the high heritability of IQ, all blacks must be subject to a single "x-factor" which affected no white populations while affecting all black populations equally^[27].

Modern researchers such as Hunt (2010), Nisbett et al. (2012) and Mackintosh (2011) reject this concept of an "x-factor" and instead consider that many different environmental factors differ systematically between the environments of white and black populations, and it is the combination of these factors that contributes to the gap in IQ test scores^{[28][29][30]}.

As such, these environmentalist proponents argue that there is no single heritability figure for IQ, as studies have shown a higher heritability of test scores in families of medium-high socioeconomic status, but considerably lower heritability in low socioeconomic status families. Their interpretation of this data is children who grow up in relative poverty do not get the chance to develop their full genetic potential^[31].

The so called 'Flynn effect' has also been claimed to discredit the view of the purely genetic origins of the IQ test gap. This trend was first identified by James R. Flynn, who showed that average IQ amongst populations has been linearly increasing since around 1930. The reasoning behind this has been disputed, but hypotheses include the improvement of nutrition, the more intellectually stimulating nature of modern society and the advent of modern medicine 'freeing up' metabolic resources that would previously be required to fight off deadly diseases^[32].

Proponents of the Flynn effect as a proof of IQ's environmental origin have frequently crossed swords with those who support Spearman's hypothesis, which claims the opposite. Spearman's hypothesis states that black-white difference in tests scores is intrinsically related to the underlying general intelligence factor, g ^[33]. As a follow on from the hypothesis, Jensen argues that some cognitive tasks have a higher g -load than others, and that these tasks are typically the kinds of tasks in which the gap between black and white individuals are greatest. Therefore, the argument is made that the difference between g is the primary driving factor in racial IQ differences^[34].

Mackintosh acknowledges the point that Jensen and Rushton have shown a correlation between g -loading and the test score gap, but he does not accept that this demonstrates a genetic origin. He points out that the tests that Rushton and Jensen consider to have the highest g -loading and heritability are those that have seen the highest increases due to the Flynn effect^[35]. This suggests that they are also sensitive to environmental changes.

Environmental arguments also point to the famous 'blue eyes, brown eyes' experiment. After the assassination of Martin Luther King Jr, American schoolteacher Jane Elliott carried out an experiment in which she designated blue-eyed children as a 'superior' group. She afforded the blue-eyed children extra privileges, such as larger lunches, access to the newer play area, and longer breaks between lessons. The blue-eyed children sat in the front of the classroom, and the brown-eyed children were sent to sit in the back rows. The two groups

of children were segregated in that they could not drink from the same water, and were encouraged to stay away from each other^[36].

The blue-eyed children who were deemed "superior" were observed to become arrogant, bossy, and otherwise unpleasant to their "inferior" classmates. Their grades on tests improved substantially. The "inferior" classmates were observed to become timid, quiet and isolated. Their test performance declined, even amongst students who had previously been confident and intelligent. This experiment has led to a great deal of study in workplace diversity training, but its general results underline the potential power of stereotypes in exaggerating differences in intelligence between groups of people^[36].

Adoption studies have also been used by both sides of the argument to determine the relation between genetic makeup and environmental upbringing. By investigating whether black children adopted into white families, researchers have hoped to gain an understanding in how their IQ test scores compare to black children reared in black families.

However even these studies have been difficult to justify, as argument remains as to whether the environment of black children, even when raised in white families, are truly comparable to the environment of white children. For example, the impact of racism or stereotyping towards black individuals raised in primarily white environments is largely unquantifiable. Reviews of the adoption study literature has pointed out that it is perhaps impossible to avoid confounding of biological and environmental factors in these type of studies^[37].

Outcomes of adoption studies have been largely mixed. The Minnesota Transracial Adoption Study (1976) examined the IQ test scores of 122 adopted children and 143 biological children reared by high socioeconomic status white families^[38]. The children were restudied ten years later. The study found higher average IQ for whites compared to blacks, both at age 7 and age 17^[39].

Eyferth (1961) studied out-of-wedlock children of black and white soldiers based in Germany after the Second World War and then raised by white German mothers and found no significant differences in IQ^[40]. Tizard et al. (1972) studied black, white, and mixed-race children raised in British long-stay residential nurseries. Three out of four tests found no significant differences, with one test suggesting higher scores for non-whites^[41]. Moore (1986) compared black and mixed-race children adopted by middle-class families in the United States. Moore observed that 23 black and mixed-race children raised by

white parents had a significantly higher mean score than 23 age-matched children raised by black parents (117 vs. 104)^[42].

The discussion is therefore very unclear. Environmental and genetic factors, as always, are interlinked. What is important is that the genetic hierarchy of merit that market apologists use to justify anti-egalitarian rhetoric is clearly an oversimplified falsehood. Environmental and genetic components are complex and interdependent, and frequently more equitable environments seem to reduce differences in intelligence, rather than rendering them intractable. So can the argument be made that differences in intelligence are a spanner in the works to an egalitarian social model?

The Follow-on Arguments: Violence and Criminality

The argument of intelligence is further linked with other, somewhat insidious arguments to reinforce hierarchical society, and as a counter-argument to any attempt to move towards an alternative. It has long been known through research that the incarcerated population in most developed countries possesses an average IQ which is significantly below the national average. In a meta-study into U.S. prisoners, it was found that;

"The majority of studies have found IQ differences between offenders and nonoffenders (e.g., Ellis & Walsh, 2003). On average, the IQ for chronic juvenile offenders is 92, about half a standard deviation below the population mean. For chronic adult offenders, however, the average IQ is 85, 1 standard deviation below the population mean. A study of Texas inmates who entered the prison system in 2002 indicated that approximately 23% of the inmates scored below 80, almost 69% scored between 80 and 109, and only 9.6% scored above 110 (Ellis & Walsh, 2003)"^[43]

In the UK, the situation is similar. In 2007, Juliet Lyon, director of the Prison Reform Trust stated that:

"...[H]igh numbers of people with learning disabilities and difficulties are held behind bars. It raises important questions about how they got caught up in the criminal justice system in the first place and whether those responsible for special education, social care and family support could have done more to prevent this"^[44]

The clear correlation of IQ and criminality, and the argued correlation of IQ and race thus combine together into a further argument; certain races are more likely

to become criminals. Furthermore, the argument of the genetic determinacy of intelligence therefore leads to the conclusion that certain races are *intrinsically pre-disposed* to violence and criminality.

So called race 'realist' Jared Taylor has written to a great extent as to how African Americans are significantly more likely to engage in criminal activity across the board, and how this trend is explainable not by socioeconomic circumstance, but instead is an innate behavioural tendency amongst African Americans^[45].

One can see that equality is difficult to argue for under the assumption that people of different skin colour are inherently violent, insidious and criminal. This worldview also has significant ramifications for social policy, immigration policy and international aid. Justification for strict immigration laws, isolationist economic policy and ambivalence to disparities in national living standards can be made much more palatable when imbued with the belief that certain races are not only less intelligent, but also more predisposed toward violence and theft.

As we have seen, intelligence is far more fluid and changeable than the Rothbards of the world would argue. Even with our genetic disparities being extant and clear, we have seen that between modern multicultural societies, economic equality correlates well with the rate of incarceration. More pertinently, this trend seems to be independent of racial demographics.

With reference to Figure 2.4-3, and focusing on multicultural Western nations, we can see that the Netherlands and the UK have significantly different incarceration rates, despite possessing approximately the same percentage of black citizens (3.1% vs. 3.3%)^[46]. The Netherlands also features an incarceration rate which is significantly lower than Italy, despite Italy being home to far fewer African immigrants (0.5%).

Furthermore, France is estimated to have a population up to 8% black^[46], but features an incarceration rate which is noticeably lower than the UK. Indeed, when assessing incarceration rates, a population's racial demographic shows a much weaker correlation when compared to economic inequality (Figure 2.4-3).

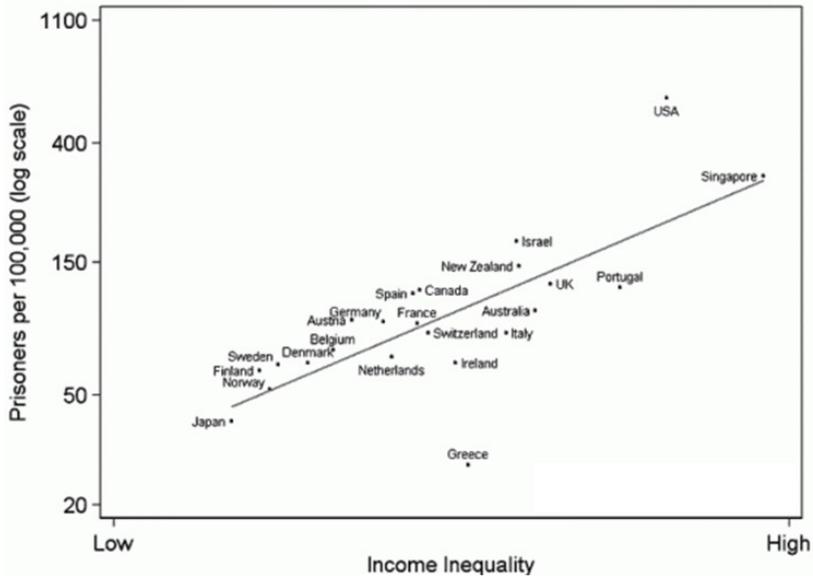


Figure 2.4-3: Incarceration rates amongst Western nations - Taken from [47]

The relationship between violence and race is therefore fairly complex, and clearly cannot be reduced to a simple genetic determinist argument. There are obviously significant social and environmental factors to consider when looking at crime rates amongst multi-racial societies.

The Osmosis of Immigration

The politics of immigration remains a strong divisive factor within most Western multicultural societies. The rise of anti-immigration political parties, such as UKIP in the UK, has shown that there remains a bubbling disagreement within general populations as to the benefits of immigration. Ed West of the Telegraph newspaper, in a review of conservative philosopher Roger Scruton's latest book, wrote that;

"[T]he optimists are behind two related utopian ideas that dominate their age. The European Union, like Soviet Communism, is an unachievable goal chosen for its abstract purity, in which differences are reconciled, conflict overcome and mankind soldered together in a metaphysical unity, can never be questioned, since in the nature of the case it can never be put to the proof."^[48]

These views are generally common amongst the anti-immigration community; that forcing multiple cultures together in one nation is counter to the inherent

propensity for humans to look out for their own, and to be wary of outsiders. West, as well as the majority of other individuals who harbour anti-immigration views, argues that the trend of multiculturalism is largely a political phenomenon that has been engineered by ideological government policy, in a similar way that Soviet Communism was enforced by a political elite onto an unwitting population.

However, it is notable that West is simultaneously a fairly vocal opponent of neoliberal free market fundamentalism. In an interview with the online blog, *Liberal Conspiracy*, West goes on to argue that;

...[T]he general idea is that liberal individualism has been taken too far and fails to take account that humans are social animals and don't generally act or think like individuals. Both the Left and Right have embraced this, in the latter case with a sort of market fundamentalism. We're not rational, isolated individuals who calculate only our own best interests, we have families, friends, wider communities, fellow religious believers, compatriots whose interests we wish to look after (and should look after).^[49]

West however seems to tiptoe around the follow-on argument to these two points. Like many anti-multiculturalism activists, immigration and free market fundamentalism are largely viewed as separate ideological prerogatives that have been pushed by ideological institutions. The crux is however that immigration and laissez-faire economic policy are interlinked to an undeniable degree. The History and Policy think tank summarised this relationship between the two phenomena in their policy paper, *Myths about migration: historical and philosophical perspectives*:

"Today, as in the past, global economic gradients of difference are among the most salient differences motivating migration. Setting aside the cases of refugees and many internally displaced persons, much of current and future global migration is essentially an economic phenomenon, a fact obscured by the narrowly political terms in which it is often debated. Modern societies have indeed two animating principles - the political and the economic -- which correspond to two different and sometimes conflicting bases for belonging to and in a society. The concept of citizenship has in the last hundred years come to depend as much on working as on voting. Indeed working is widely viewed as more of an imperative than voting. And the discipline of the market driving people to work is relied upon at local, national, and

global scales. Yet at the global level individual migrants are often criminalised for responding to the economic incentives which the global economy relies upon for its functioning."^[50]

It goes on to argue that:

"It follows that wherever there is a strong economic gradient attracting immigration, states that are integrated into the global economy are unlikely to be able fully to prevent it, though they have the power to force it into illegal channels by restricting the legal ones. As the International Organization for Migration's 2004 report on 'Migration Trends in Poland' remarks about migration in general, 'As long as the movements are driven by labour related issues, the interior dynamics of migration will always take precedence, no matter if the destination state will restrict it or not.' In such circumstances, liberal democratic states are likely to lack not only the ability but also the concerted political will to prevent illegal immigration, since some employers and consumers depend on it and can exert political voice (if sotto voce) in its favour."^[50]

The irony is that modern Western nations, as well as other developed nations maintain their high consumption rates using resources that are primarily obtained from the developing world. Modern developed nations remain strongly invested in overseas land (see Figure 2.4-4). This ongoing acquisition of land in developing nations has often been termed 'land grabbing' and has been a phenomenon which disproportionately displaces poor individuals in poor nations.

The result is an economic gradient as described by the History and Policy paper. Based on the simple individualist prerogatives of the market incentive, the only logical progression for the most families in poor nations is to emigrate to nations with greater wealth and opportunity. Thus the actions of the neo-liberal market system is to not only encourage immigration in order to fill low skilled jobs, but also to exploit global disparities in resources, creating a greater gradient which further exacerbates immigration.

We can therefore see that immigration and multiculturalism is not some statist project, it is instead a function of global market operation. The problems associated with multiculturalism and cultural difference are therefore clearly not a stumbling block to an egalitarian society. Instead, the underlying cause of mass immigration is the inherent inequality between developed and developing nations.



Figure 2.4-4: Chart of investor vs. target countries within the global economy - Adapted by author from [51]

Lessening the economic disparity between nations would remove the primary economic impetus which underlies immigration, and thus reduce the numbers of migrants who come to the developed world in search of work.

But this explanation of the root of immigration is not the only argument that can be made against those who decry a pragmatic egalitarianism. When data is actually analysed, it is found that there is very little correlation between how healthy a society is, and how racially or culturally diverse it is.

Freelance scientific researcher, Gregory Paul, authored a 2009 paper in the *Journal of Evolutionary Psychology*, in which he assessed various cultural trends against a 'Successful Societies Scale', which aggregated how well a society functioned across 25 key indicators. In contrast to the emphasis that is placed upon immigration by the media and political establishments, Paul found that "*population diversity and immigration correlate weakly with 1st world socioeconomic conditions*"^[52]. Perhaps then, we are not as different to one another as we would like to think.

Correlating Xenophobia with Economic Wellbeing

A further rejoinder for Rothbard's argument against egalitarianism is that the inequality brought about by market activity acts to exacerbate negative perceptions of other races and minorities. Again, we have briefly discussed the correlation of xenophobia and extreme conservative social ideals with economic hardship in chapter 1.9, but the discovery of this tendency amongst humans and

other primates is so flagrantly ignored by market apologists that it is worth repetition.

An important study into this phenomena has been carried out by Amy Krosch and David Amodio of New York University. It concludes that when individuals are made to think about economic hardship, they are more likely to internally visualise African American faces as being "darker" and more "stereotypically black", which are perceptions that have already been linked to the expression of higher levels of mistrust and discrimination. The study also found that white participants allocated less money to an individual who was perceived as being more stereotypically black^[53].

White study participants were asked to play a money allocation game. In some cases, they were told that it was possible to distribute up to \$100 to a partner; in others, they were told that it was only possible to distribute up to \$10. In either case, participants were ultimately given the same \$10 to distribute. Thus, in the scenario in which \$10 was used as the maximum, a perception of scarce resources was created.

Afterwards, participants were asked to look at a series of images of paired faces. All of the images were actually based on the same original composite image, a mixed-race "morph" created from 100 black and 100 white faces, and then randomly degraded in quality by different patterns of visual noise. It was found that those who had been subject to the scarce resource distribution (\$10 total) rated the faces towards more exaggerated African American features^[53].

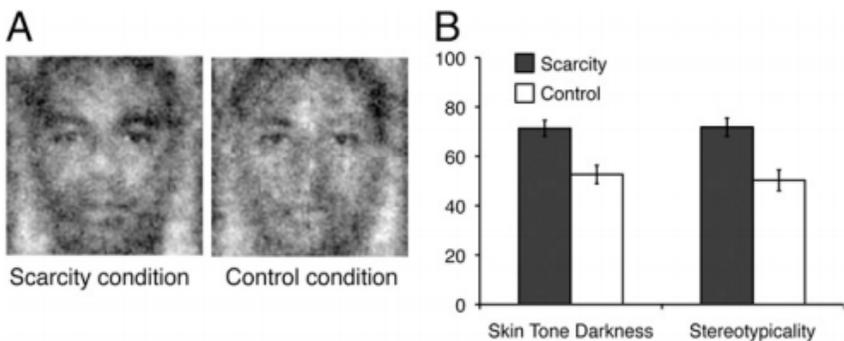


Figure 2.4-5: Example morph faces with results for each group - From [53]

In a final part of the experiment, a new group of white participants were shown the two images above, and asked to divide \$15 in single dollar bills between the

fictional people (thus, giving each \$7.50 was not a possible option). In this scenario, people generally tried to be relatively egalitarian, but they could not divide the money 100 percent evenly. At best, somebody had to get \$8, and somebody had to get \$7. It was found that the participants ultimately gave the person with the lighter coloured, less "stereotypical black" face more money^[53].

Circumstantially, this appears to confirm our intuitions surrounding economic hardship. The classic example of a racist ideology emerged in the form of German Nazism in the period between World Wars, but the Versailles reparations and Weimar hyperinflation had left Germany a withered husk of a nation, and thus a hotbed for xenophobic scapegoatism. But this trend of militantly racist groups gaining traction during times of hardship is well documented in statistics.

In a 2010 report by the Southern Poverty Law Center into the rise of racist or anti-immigrant hate groups, it was found that after the 2008 financial crisis, armed patriot and militia groups rose by 244%. It states that undoubtedly the election of Barack Obama, the first black President of the United States was a factor, however it lists a "frustration over the government's handling of the economy" as a more important component, and that Barack Obama has acted more as a "lightning rod" to hateful individuals than the root cause of their anger^[54].

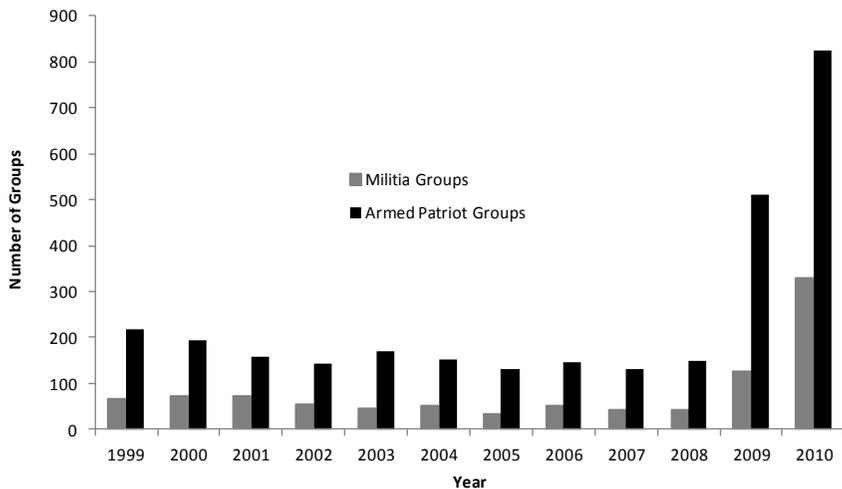


Figure 2.4-6: Number of US. militia and patriot groups over time - Adapted by author from [54]

The view of the United Nations concurs with this general theme. In a fact sheet issued in 2009 after the beginning of the financial crisis, the UN warned that the recovery from this significant recession would likely invoke racism and xenophobia amongst affected nations:

"History shows that times of economic depression have a negative impact on social cohesion. All previous crises of the 1900s, including the Great Depression, the Oil Crisis, the Asian financial crisis, the Russian financial crisis and the Latin American financial crisis, affected migration in distinct ways and spurred resentment of foreigners and xenophobic actions. Processes of xenophobia and discrimination operate at different levels in a mutually reinforcing manner. They are simultaneously rooted in individual, social, media, political and government dynamics."^[55]

It is therefore important to understand these dynamics within societies, and rise above the arguments of free-market apologists who would highlight our differences as defence for a socioeconomic system built on inequality. Pragmatic and realistic economic egalitarianism not only seems to minimise the differences between social groups, but also acts to make our mindset more accommodative to differences amongst us.

The Epigenetic Reality

Epigenetic theory emphasises the high degree of coupling between genetic and environmental factors, and largely backs up the mixture of factors that can be shown to affect intelligences and attitudes. As with any highly politicised discussion, ideological absolutism is rife. The hard left and right hold firm to the 'nature vs. nurture' dichotomy in order to prop up their own disparate visions of the ideal society.

The left will demand that all differences between people are solely environmental, and hence a society which does not possess a high degree of uniformity across all racial lines is indicative of some form of discrimination, which must be ousted. The right will argue that individual competition based upon merit has created the distribution of race across society, and therefore any attempt to redress this imbalance is unnatural social engineering.

As usual, the truth lies somewhere between these two views. As science shows, the definitions of race and intelligence give us a loose view of human biology that can be shown to approximately correlate. There is therefore a clear difference in humans across the genetic spectrum. However, as we have seen,

environment and culture does play some role. The two factors are interlinked and interdependent, and holding a single side of the argument with disdain for the opposing side will fundamentally result in a flawed view of society.

As we have seen, a realistic egalitarian society has significant positive effects upon interpersonal relations. Furthermore, not only does xenophobia between groups of people diminish with greater general prosperity, but a reduction in xenophobia also acts to reduce the underperformance of racial minorities.

Differences of course remain, as they do between humans of any ilk, but to argue that these differences are truly incompatible with a society of economic equality is fallacious - if anything greater economic equality acts to epigenetically reduce the differences between people, rather than our differences acting as a stumbling block.

Chapter 2.4 - References and Notes

- [1]. Llewellyn H. Rockwell, Jr., (Editor), *The Irrepressible Rothbard: The Rothbard-Rockwell Report Essays Of Murray N. Rothbard*, Center for Libertarian Studies, 2000, pg391
- [2]. *Ibid*, pg391
- [3]. Richard Herrnstein, Charles Murray, *The Bell Curve: Intelligence and Class Structure in American Life*, Simon & Schuster Ltd, 1996
- [4]. Christopher Jencks, Meredith Phillips, *The Black-White Test Score Gap: Why It Persists and What Can Be Done*, Brookings, Spring 1998
- [5]. Ulric Neisser, *Intelligence: Knowns and Unknowns*, American Psychological Association, Vol. 51, No. 2, 77-101, 1996
- [6]. Arthur Jensen, *Why Is Reaction Time Correlated With Psychometric g?*, Current Directions in Psychological Science, April 1993 vol. 2 no. 2 53-56 (1993)
- [7]. C. Spearman, *General Intelligence; Objectively Determined and Measured*, The American Journal of Psychology Vol. 15, No. 2 (Apr., 1904), pp. 201-292 (1904),
- [8]. Howard Gardner, *Frames of Mind: The Theory of Multiple Intelligences*, Basic Books (22 April 2011)
- [9]. R. Li, *A theory of conceptual intelligence: Thinking, learning, creativity and giftedness*. Westport, CT: Praeger, 1996
- [10]. *Ibid*
- [11]. Ulric Neisser, *Intelligence: Knowns and Unknowns*, American Psychological Association, Vol. 51, No. 2, 77-101, 1996
- [12]. *Ibid* pg79
- [13]. T. N. Carraher, D. Carraher, A. D. Schliemann, *Mathematics in the streets and in schools*. British Journal of Developmental Psychology, 3, 21-29. (1985)
- [14]. J.D. McDonald, *Haplogroups of the World*, 2005 - <http://www.scs.illinois.edu/~mcdonald/WorldHaplogroupsMaps.pdf>
- [15]. S.L. Mitchell et al, *Characterization of mitochondrial haplogroups in a large population-based sample from the United States*, Human Genetics, Jul;133(7):861-8, 2014
- [16]. C. L. Brace, *A Non-Racial Approach Towards the Understanding of Human Diversity*. In: *The Concept of Race*. A. Montagu, ed. New York: The Free Press of Glencoe, 1964

- [17]. Frank B. Livingstone, Theodosius Dobzhansky, *On the Non-Existence of Human Races*. *Current Anthropology* 3 (3): 279–281, 1962
- [18]. *Ibid*
- [19]. Hua Tang, et al. *Genetic Structure, Self-Identified Race/Ethnicity, and Confounding in Case-Control Association Studies*. *The American Journal of Human Genetics* 76 (2): 268–75. 2005
- [20]. David C. Rowe, Joseph Rodgers, ed. *Under the Skin: On the Impartial Treatment of Genetic and Environmental Hypothesis of Racial Differences*. *American Psychologist* 60 (1): 60–70. 2005
- [21]. Brace, C. Loring, *Race is a four letter word*. Oxford University Press. p. 326, 2005
- [22]. Joseph L. Graves, *The Emperor's New Clothes: Biological Theories of Race at the Millennium*, Rutgers University Press, 2001
- [23]. Earl Hunt, *Human Intelligence*. Cambridge University Press, pp. 408–410, 2010
- [24]. Ulric Neisser, *Intelligence: Knowns and Unknowns*, American Psychological Association, Vol. 51, No. 2, 77-101, 1996
- [25]. I.J. Deary, W. Johnson, L.M. Houlihan, *Genetic foundations of human intelligence*. *Human Genetics* 126 (1): 215–32, 2009
- [26]. Claire M. Haworth et al, *The heritability of general cognitive ability increases linearly from childhood to young adulthood*, Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, King's College London, De Crespigny Park, London, UK. *Molecular Psychiatry*, 15(11):1112-20, 2009
- [27]. A.R. Jensen, *The g factor: The science of mental ability*. Westport, CT: Praeger. pp. 456–8. 1998
- [28]. Earl Hunt, *Human Intelligence*. Cambridge University Press, 2010
- [29]. N. J. Mackintosh, *IQ and Human Intelligence* (second ed.). Oxford: Oxford University Press, 2011
- [30]. Richard E. Nisbett, Joshua Aronson, Clancy Blair, William Dickens, James Flynn, Diane F. Halpern, Eric Turkheimer, *Intelligence: new findings and theoretical developments*, *American Psychologist* 67 (2): 130–159, 2012
- [31]. *Ibid*
- [32]. C. Eppig C, C.L. Fincher, R. Thornhill, *Parasite prevalence and the worldwide distribution of cognitive ability*. *Proc. Biol. Sci.* 277 (1701): 3801–8, 2010
- [33]. A. R. Jensen, *The nature of the black–white difference on various psychometric tests: Spearman's hypothesis*. *Behavioral and Brain Sciences*, 8(02), 193–219, 1985

- [34]. J. Philippe Rushton, Arthur R. Jensen, *Thirty Years of Research on Race Differences in Cognitive Ability* Psychology, Public Policy and Law 11 (2): 246–8, 2005
- [35]. N. J. Mackintosh, *IQ and Human Intelligence* (second ed.). Oxford: Oxford University Press, 2011
- [36]. Jane Elliott, Peters, Williams. *A Class Divided: Then and now*: 1st Edition. Yale University Press, 1987
- [37]. N. J. Mackintosh, *IQ and Human Intelligence* (second ed.). Oxford: Oxford University Press, 2011, pp337-117
- [38]. A. Weinberg, S. Scarr, I. D. Waldman, *The Minnesota Transracial Adoption Study: A follow-up of IQ test performance at adolescence. Intelligence*, 16, 117-135. 1992
- [39]. *Ibid*
- [40]. K. Eyferth, *Leistungen verschiedener Gruppen von Besatzungskindern Hamburg-Wechsler Intelligenztest für Kinder (HAWIK)*. Archiv für die gesamte Psychologie (in German) 113: 222–41. 1961
- [41]. Barbara Tizard, Oliver Cooperman, Anne Joseph, Jack Tizard, *Environmental effects on language development: A study of young children in long-stay residential nurseries*. Child Development (Blackwell Publishing) 43 (2): 337–58, 1972.
- [42]. Elsie G. Moore, *Family socialization and the IQ test performance of traditionally and transracially adopted Black children*. Developmental Psychology 22 (3): 317–26, 1986
- [43]. J. Mitchell Miller, *21st Century Criminology: A Reference Handbook Intelligence and Crime*, 2009, pg7
- [44]. *Low IQ inmates a 'hidden problem'*, BBC News, 15 February 2007 - <http://news.bbc.co.uk/1/hi/england/manchester/6364343.stm>
- [45]. Jared Taylor, *Paved With Good Intentions: The Failure of Race Relations in Contemporary America*, New Century books, 2014
- [46]. Data taken from CIA World Factbook
- [47]. Kate Pickett, Richard Wilkinson, *The Spirit Level: Why Equality is Better for Everyone*, Penguin (4 Nov. 2010)
- [48]. Ed West, *Multiculturalism is the new Communism, and about as likely to work*, The Telegraph, August 3rd, 2010 - <http://blogs.telegraph.co.uk/news/edwest/100049177/multiculturalism-is-the-new-communism-and-about-as-likely-to-work/>
- [49]. Sunny Hundal, *Ed West interview debating the illusions of a diverse society*, Liberal Conspiracy, August 25th 2013 -

- <http://liberalconspiracy.org/2013/08/25/ed-west-interview-debating-the-illusions-of-a-diverse-society/>
- [50]. Melissa Lane, *Myths about migration: historical and philosophical perspectives*, History and Policy, 14 February 2006
- [51]. United Nations Conference on Trade and Development
- [52]. Gregory Paul, *The chronic dependence of popular religiosity upon dysfunctional psychosociological conditions*, Evolutionary Psychology 7(3): 398-441, 2009
- [53]. Amy R. Krosch, David M. Amodio, *Economic scarcity alters the perception of race*, vol. 111 no. 25, 2014
- [54]. Mark Potok, *The Year in Hate & Extremism, 2010*, Southern Poverty Law Center, February 23, 2011 - <https://www.splcenter.org/fighting-hate/intelligence-report/2011/year-hate-extremism-2010>
- [55]. *Fact-Sheet on the Impact of the Economic Crisis on Discrimination and Xenophobia*, United Nations Educational, Scientific and Cultural Organisation, Global Migration Group, October 2009

2.5 The Inertia of Religiosity

WHILE RACE IS ARGUED by many as a dividing factor which prevents any meaningful, pragmatic egalitarianism, the purely genetic differences are just one point of discussion. As different individuals from different parts of the world hold eclectic cultures as important, it is difficult to speak of race without discussing these cultures.

As we have seen in the previous chapter, the differences between what we may loosely describe as races are indeed salient, but improving economic conditions acts to ameliorate these divisive differences, rather than those differences rendering such economic improvement impossible. What is however more important to discuss is the general attitude that people of different nations and origins express in relation to one another, and how these attitudes in some cases act to amplify the perceived differences between people.

The concept of culture is baked into our international systems and processes. In the UK, prospective immigrants to the country who seek citizenship are required to pass a citizenship test, in which they are quizzed on fairly obscure facts relating to British history, laws, customs and traditions. The aim of this test is to ensure that immigrants 'integrate' into the general prevailing culture of the nation, and are not alienated or sidelined.

An absolutely central pillar to this idea of cultural difference between nations, races and social groups is religion. For many people all over the world, religion remains a dominant factor in the cultural identity of individuals, affecting the traditions, values and worldviews of these people in deeply profound ways.

However, religion is inherently different to political persuasion or national identity, as it is essentially static, and based upon the rigid teachings of unchanging holy books. As such, while political identity can revolutionise the way that people see the world as time goes on, religion acts as more of an inertia, which resists change and rallies support around traditionalism.

This view is generally shared by populations subject to mass immigration. In a UK Ipsos MORI poll in 2009, the British public opined that religion was a significantly more divisive issue amongst communities than race alone. Over 60% of the British public shared this view, including those who belonged to Asian or black communities^[1]. This is a fairly damning statistic, and goes to show that even amongst relatively peaceful Western nations, differences in culture can produce powerful divisions.

Furthermore, strong and consistent correlations between a society's level of religious belief and social dysfunction have been extensively documented. Gregory Paul has researched this effect to great extent, and has shown that more religious societies almost always have higher homicides, higher incarceration rates, higher infant mortality, more sexually transmitted diseases, more teenage births, more abortions and greater governmental corruption^[2]. A United Nations list of the 20 best countries to live in shows the least religious nations generally at the top. Virtually all the countries with comparatively little religious belief ranked high on the list of best countries, while the majority of countries with strong religious beliefs ranked poorly^[3].

Clearly religion is important as a determinant of how successful a society may be. How can a broadly global socioeconomic system prosper when such divisive chasms stand between people and their worldviews? How can the stratification of the world's nations be rectified when they seem so inextricably linked to the immovable religiosity of their populations? The answers to these questions are not straightforward, but those who would point to our religious differences as intractable and uncondusive of a prosperous egalitarian society should not claim victory just yet. As always, economics and the system of markets does much to make its presence known when assessing these phenomena.

The Economic Roots of Religiosity

Religion comes in many forms. The different religions that exist in the world today are tremendous in their diversity and variety. A Christian would view the rituals of the Shinto to be baffling; a Muslim would view Scientology to be worlds apart from their own belief. Yet even within this spectrum of faiths, and the sub-denominations therein, there are near infinite permutations of individual's actual adherence to their faith, and the importance that they place upon it in their everyday lives.

How 'important' someone views their faith is a powerful indicator as to the centrality of religion to public life. The more people within a society who place higher importance upon religion is therefore a good indicator of how religious a

society actually is, rather than simply counting the number of people who identify as a certain religion. Statisticians use this kind of polling data, among other methods, as a way of modelling the level of religiosity within a society, even when those societies may be completely different in their primary religion.

In a Pew study into the issues of globalisation, and its relationship with culture and immigration, researchers showed a clear correlation between the per capita GDP of a nation, and its level of religiosity. Poorer nations are significantly more likely to have much more religious populations, while richer nations are typically much more secular (Figure 2.5-1).

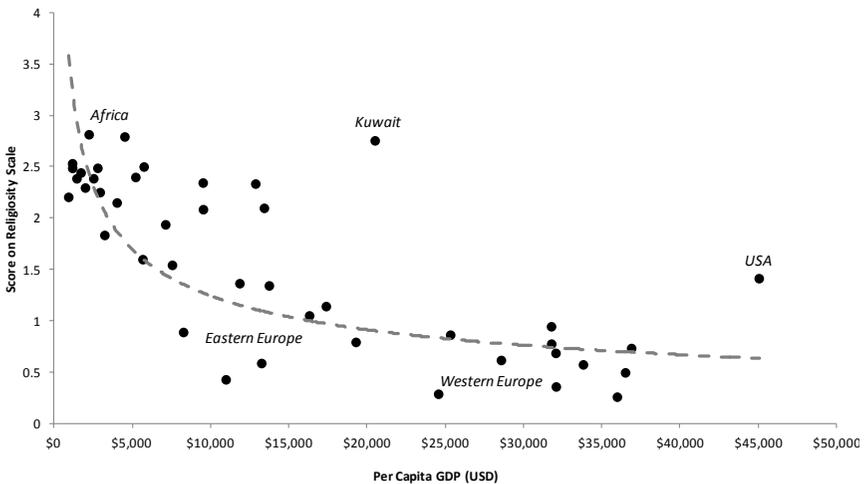


Figure 2.5-1: A plot of nations based upon per capita GDP vs. level of religiosity - Adapted by author from [4]

This study is however not alone, and this correlation between religion in a society and its level of economic prosperity has been repeatedly reproduced elsewhere. A 2009 study from Gallup assessed religiosity in 114 countries, and showed that:

"Each of the most religious countries is relatively poor, with a per-capita GDP below \$5,000, [...] This reflects the strong relationship between a country's socioeconomic status and the religiosity of its residents. In the world's poorest countries -- those with average per-capita incomes of \$2,000 or lower -- the median proportion who say religion is important in their daily lives is 95 percent. In contrast, the

median for the richest countries -- those with average per-capita incomes higher than \$25,000 -- is 47 percent." [5]

But the correlation of religion with social conditions does not end at economic prosperity. Not only are religious societies typically poorer, they are also substantially less innovative in terms of science and technology. This is shown in Figure 2.5-2.

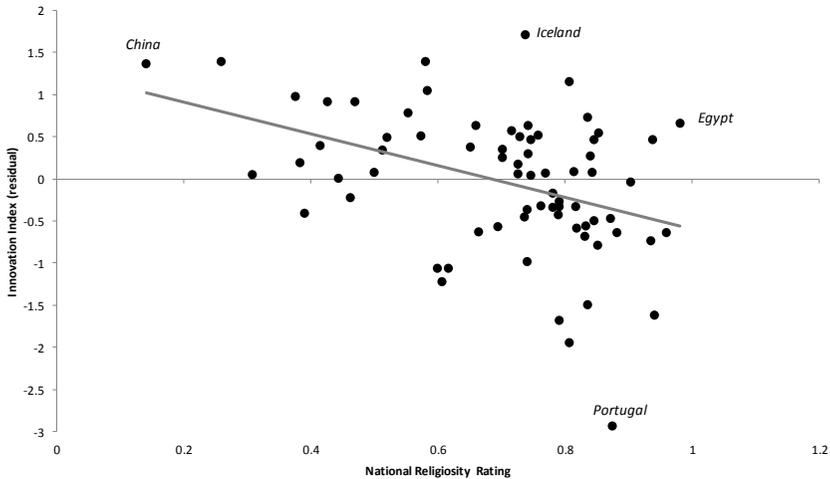


Figure 2.5-2: Nations plotted based upon level of innovation vs. religiosity - Adapted by author from [6]

This correlation is very interesting, but what is the causality here? Genetic determinists who support a hierarchical distribution of nations and people can quite easily point to the numerous studies that have correlated religiosity with IQ (Figure 2.5-3). At a glance this argument seems convincing; nations with average lower intelligence accept religion to a higher degree, which stifles innovation and hinders economic growth.

However, there is ample evidence to the contrary, that economic factors are the driving force behind religiosity within societies. Whilst innovation and religiosity show a mild negative correlation in Figure 2.5-2, when innovation is plotted against GDP per capita, a much more clear trend emerges. This is shown in Figure 2.5-4. While this does not directly confirm that the correlation is driven by economic conditions, it does add gravity to the argument.

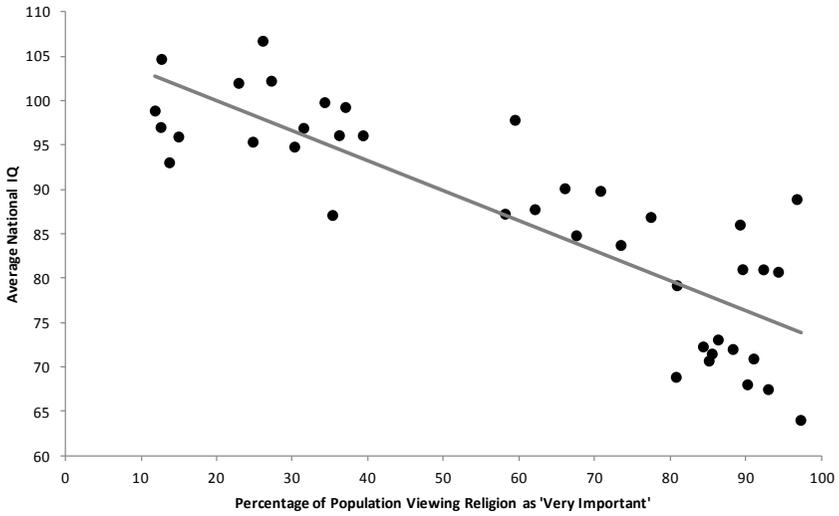


Figure 2.5-3: Average national intelligence vs. level of religiosity - Adapted by author from [7]

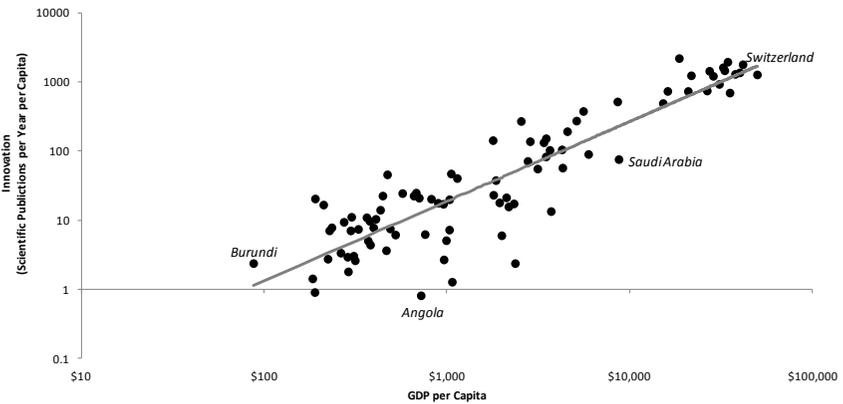


Figure 2.5-4: Innovation and per capita GDP - Adapted by author from [8]

Gregory Paul has made similar arguments for economics being a more important causal factor. Paul argues that the human mind is not genetically predetermined to adopt religious beliefs without consideration. He states that:

"The nonuniversality of strong religious devotion, and the ease with which large populations abandon serious theism when conditions are sufficiently benign, refute hypotheses that religious belief and practice are the normal, deeply set human mental state, whether they are

superficial or natural in nature. Instead popular religion is usually a superficial and flexible psychological mechanism for coping with the high levels of stress and anxiety produced by sufficiently dysfunctional social and especially economic environments. Popular nontheism is a similarly casual response to superior conditions."^[9]

The Gallup organisation has also contributed to this economic theory of religiosity. They argued that religion is more important in helping many residents cope with the daily struggles to provide for themselves and their families^[10]. This argument is largely in line with a previous Gallup analysis, which concluded that the relationship between religiosity and emotional wellbeing is stronger among poor countries^[11].

A counterpoint to this theory is the case of the United States. As shown in Figure 2.5-1, the United States is a significant outlier from the general trend, in that it possesses very high GDP per capita, yet simultaneously high religiosity in comparison to similarly prosperous developed nations. This seems to suggest that economic conditions are not directly relevant to the level of religiosity in all cases.

However, Professor of biology, Jerry A. Coyne argues that the United States remains consistent with the idea that economic conditions drive the extent of religiosity. The United States remains a very economically unequal nation, and therefore the GDP per capita is highly skewed by a small number of super rich individuals. Coyne constructed a score to rate a society based upon how dysfunctional it is. This score encompassed various social ills such as rates of crime and imprisonment, economic inequality, level of support for citizens etc. He found that when rating the United States on this scale, the USA's religiosity was fully in keeping with the general trend^[12] (Figure 2.5-5).

As we have seen in chapter 1.8, the effect of income inequality is pathological to various measures of social wellbeing, many of which are used within Coyne's social score. Economic inequality may therefore be a strong candidate as a causal factor in levels of religiosity. The causality is clearer in the study of Solt et al. (2011), who showed that income inequality both across countries and across years within the United States is positively and significantly correlated with each of 12 measures of religiosity^[13].

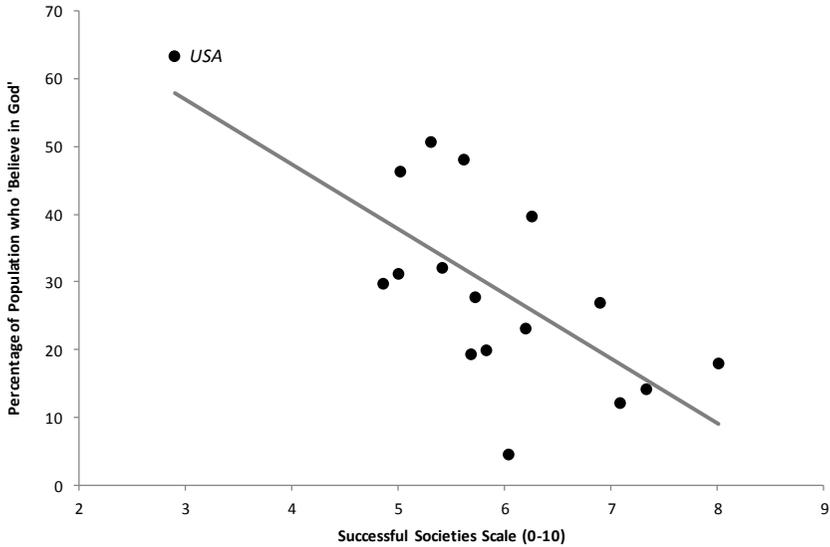


Figure 2.5-5: Religiosity in the USA as plotted on 'successful societies scale' - Adapted by author from [12]

Further, time series analysis within the United States found that changes in income inequality appear to be causal, for income inequality in a given year affects religiosity in subsequent years, but not vice versa. Solt et al. argue that this correlation reflects social control by the wealthy, because in situations of greater inequality the rich actually become more religious than the poor^[13].

Gilat Levy and Ronny Razin of the London School of Economics have also indirectly concurred with this view that economic circumstances are a contributory factor to religious fervour. In their 2006 paper, they argue that all modern religious institutions act as entrepreneurs, who demand "social rents" from their congregation.

These social rents encompass the requirement for a devotee to the religion "partaking in a costly and observable activity". They postulate that the economic requirement placed upon religious institutions demands that they gather believers who support them financially. This leads to competition between institutions for believers, which inherently favours more intolerant, absolutist attitudes. The authors write:

"A reasonable conjecture is that a competition between religious entrepreneurs leads to religions with intolerant attitudes towards each

other. In the competition for members, an intolerant religious group that otherwise shares its attributes with the tolerant religious group, may be an attractive choice for the entrepreneur. Joining the intolerant religion is de facto a membership in both religions as such a member is guaranteed the cooperation of the other religion. On the other hand, membership in the tolerant religion does not guarantee that. Consequently, individuals will tend to join the intolerant religion, resulting in higher revenues for the "intolerant" entrepreneur."^[14]

Levy and Razin's model therefore offers a pragmatic economic framework for what seems intuitively true, that is; religious fervour positively correlates with more intense economic circumstances. However there are additional factors within the scope of economics which affect the strength of religious beliefs.

More economically developed nations generally possess more advanced educational institutions, and more rigorous schooling standards. Anecdotally, this seems correct, as John G. Messerly of the Institute of Ethics and Emerging Technologies writes:

"Among the intelligentsia it is common and widespread to find individuals who lost childhood religious beliefs as their education in philosophy and the sciences advanced. By contrast, it is almost unheard of to find disbelievers in youth who came to belief as their education progressed. This asymmetry is significant; advancing education is detrimental to religious belief. This suggests another part of the explanation for religious belief—scientific illiteracy."^[15]

This anecdotal observation has further been shown to be true in a paper by Naci Mocan and Luiza Pogorelova of the National Bureau of Economic Research, which shows that one extra year of schooling makes someone 10% less likely to attend a church, mosque or temple, pray alone or self identify as religious^[16].

This effect of more advanced education on religiosity is well documented. In Turkey the effect of the increased compulsory schooling was shown to reduce women's religious self identification by 30-50%^[17]. In 2011, it was shown that in Canadian provinces, each extra year of schooling led to a decline of four percentage points in the likelihood of identifying with a religious tradition^[18].

These are powerful trends, and their economic root seems difficult to deny. However, religion remains a troublesome beast, and one which can wreak havoc when its ideals are applied in extreme circumstances. The root of extremity, and

how a post-market society might deal with such phenomena are covered in the next subsection.

Extremism

The secular left is deeply divided on the front of fundamentalist religion. The chasm stands between the arguments of causation for fundamentalist (generally Islamic) terrorism. Each argument falls into mundanely predictable camps on the side of a false dichotomy. On one side, we have the likes of the late Christopher Hitchens or Sam Harris, who firmly place blame for Islamic fundamentalism upon the fundamentals of Islam. On the other side, we have an interesting collection of social commentators, such as Noam Chomsky, and dictator appeasing hypocrites, such as George Galloway, who claim that Islamic fundamentalism is solely the result of imperialistic Western policies in the Arab world.

While economic arguments can, and frequently are, wheeled out to explain the actions of religious extremists, it is typical for these arguments to centre on the foreign policy of the West in relation to the Arab world. The strong correlation of economic opportunity and religiosity is decidedly absent from the majority of discussions in this theatre. While some truth certainly exists in the criticism of Islamic doctrine as a source for violent and brutal acts, and criticism of the West's behaviour in the Arab world, these lines of argument gloss over the amplification of religiosity when populations are subject to squalid economic conditions. Within a market paradigm, inequality and differential advantage ingrain such circumstances upon nations and demographics at large.

This intuition has been empirically assessed numerous times, and shown that those who plot or commit acts of religious terrorism are substantially more likely to have emerged from low socio-economic status. An assessment into 93 jihadists whose socio-economic status could be adequately traced found that:

"...[O]nly five can be regarded as upper class, 36 middle class and 52 lower class. From this data, it appears that very few jihadi terrorists in Europe come from higher socio-economic classes. More than half of the individuals are from the lower classes within society."^[9]

The authors are careful to point out that this may simply be a reflection of the low status of Muslim immigrants within Europe, but the trend remains interesting. If this correlation of extremist religious terrorism with economic circumstance is indeed accurate, then religious terrorism, through the lens of economics, may be viewed as an emergent cost.

Unequal circumstances have already been comprehensively shown to breed a host of social dysfunction; religious terrorism may merely be a more extreme manifestation of this social pathology. Again, this is intuitive, as with religiosity itself occurring at much higher rate amongst those of low socio-economic status, religious extremism is understandable as an extension of this trend.

Mental assessments of those who carry out religious terrorist attacks - specifically suicide attacks - has largely confirmed this economic root to extremism. While religious strength of conviction is important, Professor Ariel Merari of Tel Aviv University found that a sense of national humiliation, and a desire to avenge the suffering of their community ranked as more important factors. Merari interviewed a collection of captured suicide bombers who had survived their attack, either by device malfunction, or being forcibly captured before completing the attack. He found that the 15 suicide bombers were not significantly more religious than the control group, but featured this underlying desire to avenge their community^[20].

So can we argue that religious extremism is entirely economic? Of course not, and the propensity for a religion to inspire violence is entirely dependent upon the nature of its scripture (there are few Mormon or Jainist terrorists, for example). The argument put forth here is instead that the economic conditions between people act to amplify religious extremism, and that by designing an economic system which understands this correlation, these forms of social pathology can be minimised.

Economic Power of Religions

The religiosity of individuals under more economic stress is not the sole market based factor which furthers the extent of religiosity. Within the modern capitalist economy, religion is a product which may be sold. Within a system of cyclical consumption, the services offered by religions are no different to any other, and churches are compelled to compete, grow and prosper, or else risk being pushed out of the market.

Nowhere is this economic impetus behind religion more apparent than in the USA. Scott Thumma, professor of sociology and religion at Hartford Seminary believes that large churches in the USA (often known as "megachurches") average around \$6.5 million in income a year^[21]. At the top of these gargantuan businesses, executive pastors run proceedings, often styling themselves more after CEOs than traditional priests according to Jonathan Walton, Assistant Professor of religious studies at the University of California Riverside^[22].

According to a survey conducted by the Leadership Network, an organization created for the advancement of the Christian church, megachurch pastors earned an average of \$147,000 annually, with some pastors earning as much as \$400,000^[23]. Many megachurches diversify their business into media; DVDs, books, music, radio and television. With this free market gravity behind their word, and this uncompromising push to compete, gather followers and sell their product, it is perhaps unsurprising that religion continues to prosper in the USA despite widespread secularisation of the West.

But American Christianity is not alone in the sheer economic power it is able to wield. The Catholic church perhaps stands as the single most affluent organisation on the planet in terms of priceless art, land and banking wealth, with millions of its riches still shrouded in secrecy. The Church of Jesus Christ of Latter-day Saints also commands considerable wealth, despite its diminutive stature as a world religion. Reuters and University of Tampa sociologist Ryan Cragun estimate that the Mormon church brings in some \$7 billion annually and owns about \$35 billion worth of temples and other investments around the world^[24].

In India, the Vedic Tirumala Sri Venkateswara Temple near Tirupati is the richest temple in the world in terms of donations and wealth, and the most-visited place of worship in the world. In a typical year, this single Hindu temple can expect to generate up to INR 10 billion (estimate from 2008), or nearly \$200m^[25].

The gigantic financial lucrativeness of religion is further echoed in its sprawling advertising record. According to the July 28, 1990 issue of the weekly *Church News*, the Mormon church has been buying commercial advertisements in publications like *Reader's Digest* and *TV Guide* to carefully cultivate a wholesome, all-American image for church members, concentrating on their apparent clean lifestyle instead of their belief system^[26].

In one of the Mormon commercials, an attractive female librarian is pictured saying that of all the great books written by great authors, she prefers to read about "The Savior". She then explains that, besides the Bible, there's another testament of Jesus Christ — the Book of Mormon. According to the Mormon church, the effect of such advertisements has been "impressive"^[27].

In the UK in 2012, an advertising battle raged on the sides of British buses in a now famous advertising campaign. A Christian website called JesusSaid.org initially invested in a series of biblical quotes to be adorned on the sides of UK

buses. The British Humanist Association responded with provocative bus banners of their own. The Atheist Bus Campaign, as it became known, drew tremendous attention to the prevalence of religious advertising in popular culture, and triggered a significant backlash*.

Canadian poet Margaret Atwood weighed in on the issue in an interview with the UK Telegraph newspaper, in which she summed up the crux of this argument wonderfully; "*Once you're paying money to put slogans on things, well it's either a product you're selling, a political party or religion*"^[29]

We must therefore pose the question, in the absence of a significant economic impetus to grow, to obtain followers and to generate revenue, would these religions wield as much power as they do today? Unfortunately, due to the shady nature of many religious institution's financial records, it is difficult to correlate a church's wealth with its ability to attract followers. It however seems intuitive to suggest that in the absence of a conventional market incentive system forcing religions to compete essentially as businesses, there would be less of a requirement to attract congregations, thus less invasive marketing of religion to the population.

Given the fact that religious institutions are so eager to spend their money on advertising, it is clear that such advertising is effective, therefore marketing of religion to the population likely acts to increase public religiosity. Without traditional market-based economic impetus, would this desire to proselytise via paid advertisement be as potent? The answer is uncertain, but intuition seems to suggest that it would not.

Liberation Theology - A Case Study in Religio-Economic Protectionism

The nature of religious institutions as businesses who must compete for congregation size is however an incomplete analogy of the large scale church. At another level, religious institutions exist as a political force. Within the politics of religion, the actual ideological underpinnings of the theology is often a distinct second fiddle to the self preservation of the power structure.

Nowhere has the abandonment of religious ideology in favour of hierarchical self preservation become apparent than within the hallways of the Vatican. In addition to the sheltering of child abusers, in a scandal that still stains the image

* *One of the more insidious response ads from the religious espoused anti-homosexual wording, and drew harsh criticism from London Mayor, Boris Johnson*^[28]

of the papacy, the Vatican has been equally quick to repudiate its own ideals when dealing with alternative economic interpretations of Christianity.

In the 1970s and 1980s, Latin American Catholicism became refreshed by a movement which sought to restore Christianity to its most humble form. Peruvian priest, Gustavo Gutiérrez wrote of this movement in his book *A Theology of Liberation* (1971), a book whose title has since been used to recursively describe the movement^[30].

Liberation theology, as it became known, challenged Christianity to reform itself based upon the ideals of the original church; a politically and culturally decentralized movement which was primarily based upon practise rather than dogma. Liberation theology proposed to fight poverty and innovate a Christian view from the perspective of the poor and the oppressed^[31].

Liberation theology, like the Catholic church, developed a critique against political establishment. One of the most radical aspects of the ideology was the call for re-organisation of Christian society into what were known as Christian base communities (CBCs). The communities aimed to decentralise Christian orthodoxy from the bottom-up, with Biblical interpretation and liturgical practice designed by lay practitioners themselves, rather than by the Catholic Church hierarchy^[32].

The bottom up structure of the movement was specifically intended to interpret the teachings of Jesus Christ from the perspective of the poor, rather than the rich. In Latin America, liberation theologians used this focus on the poor to criticise the severe disparities in wealth, both within societies, and between nations. Liberation theology developed a strong critique of the various economic and social structures, such as an oppressive government, dependence upon First World countries and the traditional, wealthy, hierarchical Church.

Despite the invigoration of Christianity in Latin America, and strong support for its "*preferential option for the poor*"^[33], the movement drew heavy criticism and dismissal from the Vatican. In March 1983, Cardinal Ratzinger (who would go on to become Pope Benedict XVI), head of the Vatican's Congregation for the Doctrine of the Faith (CDF), criticised Gutiérrez and accused the liberation theology movement of politically interpreting the Bible for their own ideological desires^[34].

Ratzinger railed on the movement as a form of Christian Marxism, and objected that the spiritual concept of the Church as "People of God" had been artificially

transformed into a "Marxist myth."^[34] Throughout his tenure as head of the CDF, Ratzinger remained a vocal critic of liberation theology, and prohibited priests who identified with the movement from being associated with the name of the Catholic Church. Ratzinger suspended Brazilian priest and liberation theologian Leonardo Boff; he excommunicated Tissa Balasuriya of Sri Lanka for failing to "*adhere with religious submission of will and intellect to the teachings of the Roman pontiff.*"^[35] ; other priests were also censured and reprimanded for teaching liberation theology to their congregations.

Why would this be the case? Why would the pontiff in Rome clamp down so harshly upon a flourishing religious movement that was revitalising Latin America and bringing Christian belief to the poor in huge numbers? The answer is that the Catholic Church is not only a business, but also a political entity. While such support of Christianity is ideologically beneficial to the religion as a whole, pressure upon the church to change its approach, especially in a manner that may cause revenues to fall, ultimately is detrimental to the institution.

As stated earlier, religious institutions are self preserving, political businesses. They espouse an approximate political stance in accordance with their business model, not necessarily their ideology. While churches may sometimes make strong ideological arguments, such as the Catholic stance on abortion or contraception, these stances are only held if they are economically beneficial (or neutral).

The basal function of the religious institution is to economically preserve itself, and while liberation theology struck a chord with many Christians, and revitalised grass roots Catholicism, the critique of the Vatican's economic position was too dangerous to allow to spread amongst catholic clergy. Thus, the institution ridded itself of prominent liberation theologians, and distanced itself from their teachings, despite the penance that they subsequently paid in terms of popularity.

The crux of this is that economics and institutional religious ideology are fundamentally fused within a market economy, simply because institutions must be marketable and solvent in order to exist. This impetus of economic survival results in the largest and most influential churches inevitably being more economically savvy. Bread and water, peace loving churches, who place little emphasis on proselytising, who distribute wealth to the poor more than they accumulate, and who preach mutuality and inclusion rather than otherness are actually economically disadvantaged under this system, and their sphere of influence is understandably smaller. Instead, the economic system actively

rewards the more predatory, hierarchical, financially erudite, and divisive religions.

Can we therefore realistically say that religion acts as a stumbling block toward a post-market economy? In a variety of different ways, the market acts to entrench our religious differences, bestow political and financial sway upon the more exclusionary and insular religions, magnify our adherence to religion, and statistically increase our likelihood to commit acts of extremism.

Based upon this analysis, it seems that detrimental religious behaviour is again a form of social pathology that emerges from the inherent basal economic circumstances that exist in societies. As such, an argument for religion as a spanner in the works for any improvement of global economic conditions should be taken with a pinch of salt.

Chapter 2.5 - References and Notes

- [1]. *New Commission poll shows British institutions need to 'keep up with Obama generation*, Equality and Human Rights Commission, 2009
- [2]. Gregory Paul, *Cross-National Correlations of Quantifiable Societal Health with Popular Religiosity and Secularism in the Prosperous Democracies: A First Look*, Journal of Religion and Society, Vol 7, 2005
- [3]. Khalid Malik et al, *Human Development Report 2014, Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*, United Nations Development Programme, 2014
- [4]. *World Publics Welcome Global Trade — But Not Immigration*, 47-Nation Pew Global Attitudes Survey, Pew Research Center, October 4, 2007
- [5]. Steve Crabtree, *Religiosity Highest in World's Poorest Nations*, Gallup, August 31, 2010
- [6]. Roland Bénabou, Davide Ticchi, and Andrea Vindigni. *Forbidden Fruits: The Political Economy of Science, Religion, and Growth*. NBER Working Paper No. 2110, 2015
- [7]. Data taken from Razib Khan's Gene Expression - <http://www.gnXP.com/MT2/archives/001523.html> (original data traceable back to; Richard Lynn, Tatu Vanhanen, *IQ and the Wealth of Nations*, Praeger, 2002, and; Pew Research Centre)
- [8]. Klaus Jaffe, *Science, Religion and Economic Development*, Interciencia, 30(8), 2005
- [9]. Gregory Paul, *The Chronic Dependence of Popular Religiosity upon Dysfunctional Psychosociological Conditions*, Evolutionary Psychology Volume 7(3). 2009
- [10]. Steve Crabtree, *Religiosity Highest in World's Poorest Nations*, Gallup, August 31, 2010
- [11]. Steve Crabtree, Brett Pelham, *Religion Provides Emotional Boost to World's Poor*, Gallup, March 6, 2009
- [12]. Jerry A. Coyne, *Science, Religion, and Society: The Problem of Evolution In America*, Evolution 66-8: pp2654–2663, 2012
- [13]. Frederick Solt, Philip Habel, J. Tobin Grant, *Economic Inequality, Relative Power, and Religiosity*, Social Science Quarterly, Volume 92, Issue 2, pp447–465, June 2011

- [14]. Gilat Levy, Ronny Razin, *A Theory of Religion: Linking Individual Beliefs, Rituals, and Social Cohesion*, No 19, Meeting Papers from Society for Economic Dynamics, 2007, pg22
- [15]. John G. Messerly, *Religion's smart-people problem: The shaky intellectual foundations of absolute faith*, Salon, Sunday, Dec 21, 2014 http://www.salon.com/2014/12/21/religions_smart_people_problem_the_shaky_intellectual_foundations_of_absolute_faith/
- [16]. Naci Mocan, Luiza Pogorelova, *Compulsory schooling laws and formation of beliefs: education, religion and superstition*, National Bureau of Economic Research, NBER Working Paper No. 20557, October 2014
- [17]. *Falling away*, The Economist, Oct 11th 2014 - <http://www.economist.com/news/international/21623712-how-education-makes-people-less-religious-and-less-superstitious-too-falling-away>
- [18]. *Ibid*
- [19]. Rik Coolhaet, *Jihadi Terrorism and the Radicalisation Challenge*, Ashgate, 2011, pg140
- [20]. Ariel Merari, Ilan Diamant, Arie Bibi, Yoav Broshi, Giora Zakin, *Personality Characteristics of "Self Martyrs"/"Suicide Bombers" and Organizers of Suicide Attacks*, Terrorism and Political Violence, Volume 22, Issue 1, pp87-101, 2009
- [21]. *Mega churches mean big business*, CNN, January 22, 2010 - <http://edition.cnn.com/2010/world/americas/01/21/religion.mega.church.christian/>
- [22]. *Ibid*
- [23]. Audrey Barrick, *Report Reveals Salaries of Megachurch Pastors*, The Christian Post, September 15, 2010 - <http://www.christianpost.com/news/report-reveals-salaries-of-megachurch-pastors-46779/>
- [24]. *Mormon church earns \$7 billion a year from tithing, analysis indicates*, NBC, Aug 13, 2012 - http://investigations.nbcnews.com/_news/2012/08/13/13262285-mormon-church-earns-7-billion-a-year-from-tithing-analysis-indicates
- [25]. Tirumala Venkateswara Temple, India Index, June 20, 2015
- [26]. *Religious Advertising*, Christian Research Institute, April 14th, 2009
- [27]. *Ibid*
- [28]. Robert Booth, Hélène Mulholland, Patrick Strudwick, *Anti-gay adverts pulled from bus campaign by Boris Johnson*, The Guardian, 12 April 2012

- [29]. Sinclair McKay, *Margaret Atwood*, The Telegraph, 20 Aug 2009 - <http://www.telegraph.co.uk/culture/books/6061404/Margaret-Atwood.html>
- [30]. Gustavo Gutierrez, *A Theology of Liberation*, Orbis Books (Maryknoll, New York), 1973
- [31]. Elisabeth Erin Williams, *Liberation Theology and Its Role in Latin America*, Journal of International Studies, The College of William and Mary, Volume 7, Issue 1, 2000
- [32]. *Ibid*
- [33]. Gustavo Gutierrez, *A Theology of Liberation*, Orbis Books (Maryknoll, New York), 1973
- [34]. Cardinal Joseph Ratzinger, *Liberation Theology: Preliminary Notes*, in; *The Ratzinger Report*. Reprinted in: J.F. Thornton and S.B. Varenne, eds., *The Essential Pope Benedict XVI*. Online version: Harper Collins, 2007
- [35]. Gerard Sloyan, *Vatican Excommunicates Progressive Theologian: The Basis Of The Censure*, 1 April 1997

Part Three: The Blueprints

THE FIRST SECTION of this book has covered the reasons why a shift away from the conventional market economy is necessary in order to maintain human civilisation, while the second section has proposed a conceptual framework of a post-market economy and defended this framework from the traditional criticisms. The difficult topic which we must broach presently is what this conceptual framework might look like in a real world application.

The difficulty in approaching this study is that our framework societal concept is based upon scientific groundwork; a body of work which we must begrudgingly admit has not yet been fully compiled. We simply do not have the data to draw any inferences as to what the optimum human society would look like, as while much of it may be available, it is not readily accessible and is presented in a scattered and disorderly manner. We therefore do not conclusively know how a society might look if the scientific approach was actually applied in its running.

This, in reality, is what sets the philosophy of this book apart from the traditional schools of political theory. The end condition is not prescribed. Unlike Marx, I do not know if the optimum society would be a classless, stateless communist one; unlike Rothbard, I do not know if it would be an unregulated, dynamic economy of exchange.

Therefore the third and final section of the book will present what can be described as 'blueprints', as they reflect a technical design of a post-market society, but not necessarily *the* technical design for a post-market society. Based upon the theory presented in the second section of the book, we will build an example society that theoretically ticks all the boxes in our aims, our benchmarks and our constitution.

3.1 Post Market Economics

IN 1920, LUDWIG VON MISES proposed his coup de grâce against the socialist economic model. In his paper, *Economic Calculation in the Socialist Commonwealth*, von Mises criticised the socialist model of economic planning on the basis that its distribution of goods is irrational, and that the only rational expression of value can come through market prices. The criticism would go on to be refined and built upon, resulting in what has broadly come to be known as "the economic calculation problem". This problem would become the deathblow for any argument against market economics - if only the market was capable of a rational distribution of goods and services, then any alternative model would inevitably be unable to function.

On the other side of the coin, Karl Marx's developed his labour theory of value. Marx honed his theory in order to arrive at an empirical measure against which all goods and services could be modelled, in the absence of market prices. Marx posited that goods and services can only have value based upon the volume and skill level of labour that has gone into them. For example, the handmade Rolls Royce is more valuable than the factory assembled car because it required more man-hours to produce.

It is however clear that both of these views are patently wrong. There is an inarguable hierarchy of products and services within society in terms of rankable importance, which often is in stark contrast to the market price that those products or services command. Furthermore, items which have been produced with relative ease can also command gigantic prices due to hype, brand obsession or other hysterical phenomena.

Somewhere between these two extremes, and as a basic principal of a post market society, a system of objective value must be developed. This system of value must come to an understanding that certain products and services are utterly integral to human life, and others are less important. This understanding must be enshrined within any economic system if it is to function to an adequate level.

A Hierarchy of Value

Market-centric rhetoric has seduced us in our perception of value in many unusual ways. The market traditionally tells us that all goods and services fundamentally compete upon a level playing field for the attention of the rational consumer. Upon this playing field, the consumer must trade off life supporting goods and services (such as food or water) against the most trivial of purchases (such as the number of channels on their television subscription). Additionally, this equality of value is reflected on the supply side of the equation. Investors and developers put their financial support behind the product or service which is most profitable, regardless of whether this is a crucial life support system, or a trivial luxury.

However when we strip away the market-centric dogma that plagues the philosophy of economics, we can readily see that a hierarchy of value is blindingly self evident. Without provision of certain products and services, mass unrest, societal collapse and widespread death would occur within days. Figure 3.1-1 shows the correlation of food prices with social unrest. It is clear that around the peaks of food price, we see a tremendous explosion of unrest which quickly falls away with the availability of food.

This is the side of economics that the market does not act to calculate, as the economic damage caused to society through serious dysfunction (such as a lack of food) is chaotic, widespread and hard to account for in the individualist market sense. However, these dispersed costs do exist, and are frequently the most disastrous circumstances that can befall a population. Because of this, it is of the utmost importance that these critical services (such as food production) are acknowledged as being more crucial to society than others.

With this in mind, Figure 3.1-2 is presented as a preliminary hierarchy of value. At the base of the pyramid, we see the most basal needs that are required for humans to survive. Humans need food and water on a daily basis, and if these needs are not provided, then a human cannot survive, and a human civilisation is thus impossible. Above these are basic needs for humans to function in a social sense, and not be condemned to a wild struggle for survival; adequate shelter, housing and protection from the weather, including flood and wind defence systems.

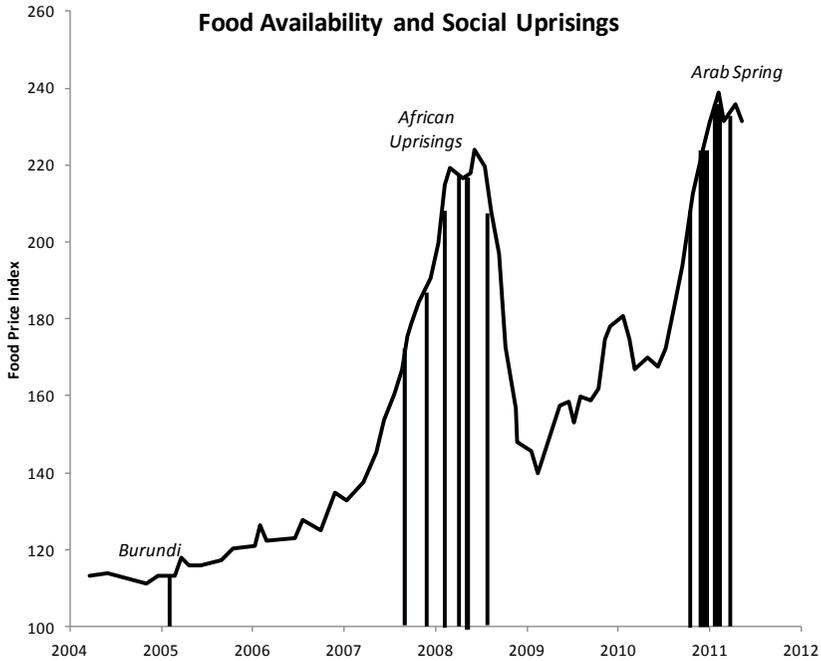


Figure 3.1-1: Correlation of social uprisings with food price index - Adapted by author from [1]

Nested above these basic needs are the provision of more modern, but equally crucial services; healthcare (including mental healthcare), paramedic and fire services and general policing, where needed, provide society with a stability from extreme or unusual circumstances. With these services accounted for, remaining value can be directed towards the less survival critical services and infrastructure; transportation, communications, etc.

Above these, comes the provision of entertainment for the population; cinemas, music venues, art galleries and museums, pubs, television, radio, etc. encompassing any services and products which are not related to the survival or safety of individuals, but necessary for humans to lead a fulfilling and interesting life. Finally, the most superficial and least survival critical products and services are ranked. These include decorative and aesthetic products, luxury goods, etc.

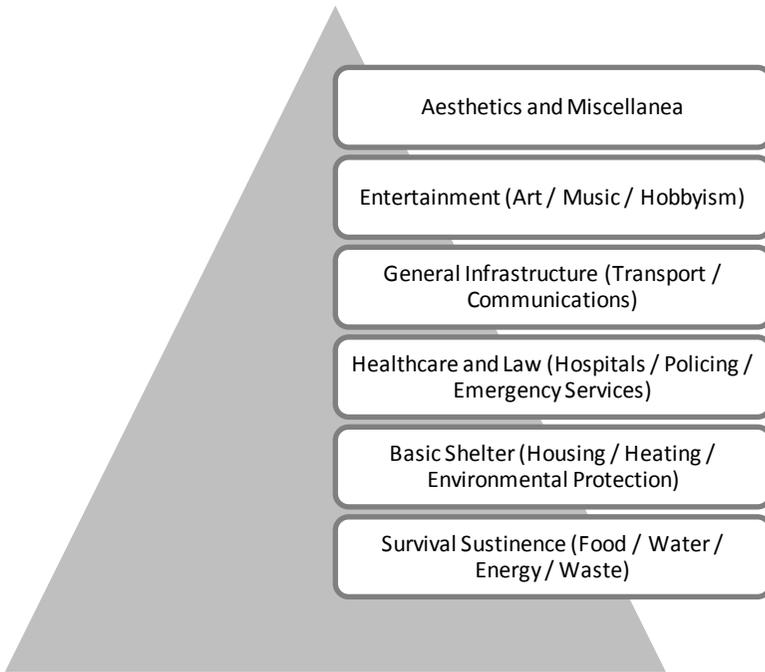


Figure 3.1-2: Preliminary hierarchy of post-market value

For any readers who are confused by this approach, do not worry; assessing society in this way is difficult when surrounded with such market-centric philosophy. The hierarchy in Figure 3.1-2 is best illustrated by considering a parallel complex system.

Consider the design process of a complicated, safety critical engineering project, for instance an aircraft, or a ship. Both a ship and an aircraft can be considered to be a complex system, in which multiple subsystems work together to provide a service to human beings. Like society, an aircraft must consider human safety, survival and entertainment; it must protect humans from certain extreme phenomena, while providing them with mundane services for their general wellbeing.

Like society, the design of an aircraft or ship is subject to an initial budget. Society decides how this budget is spent through a combination of democracy, and free market forces. However, the aircraft is designed in a decidedly different manner. It would seem utterly absurd for a commercial airliner to be designed based upon the vote of the general public, regardless of their knowledge of engineering. It would seem even more absurd for the engineering company

responsible for the aircraft to allocate the budget of design based upon competition between all the constituent components; for instance, the tray table designers competing against the engine or wing engineers for budget.

The hierarchy of value within complex engineering design projects is considered self evident. An aircraft without adequate wing structure will break and fall from the sky; a ship without proper hull integrity will sink. These aspects of design will therefore rightly attract more effort, more scrutiny, more design time, more testing, etc. After the most fundamental structure, safety critical systems are the next priority; cabin pressure systems, navigation, air circulation etc. Only when all of these parts are in place will focus be shifted to the colour of carpets, the onboard entertainment, the fabric coating of the seats, the livery paintjob etc.

Human society is a system of vastly greater complexity when compared with a simple aircraft or ship, yet this straightforward design philosophy is not applied. Instead of categorising and ranking systems in terms of their survival importance, systems are ranked in terms of profitability based upon the assumption that profitability correlates with public benefit.

Dynamic Response and Factors of Safety

When designing a complex system, uncertainty ranks as a highly problematic design concern. Returning to our aircraft analogy, we observe that in the typical life of a commercial airliner, freak incidents can and do occur. Unpredictable, once-in-a-million circumstances can destroy the most well designed aircraft if the occurrence is not considered. As such, engineers must consider the most outlandish failure possibilities in order to account for the worst possible circumstances. The result of this is a design which is fundamentally over-engineered. The features of the design are specifically driven by extreme circumstances which realistically may never actually occur.

So what does this actually mean in terms of a post market economy? The crux of the matter is that the market system in its current form is fundamentally unable to deal with such extreme circumstances. As we have discussed in part one, extreme, chaotic or unpredictable scenarios that may arise in day-to-day human life typically manifest themselves in terms of price shocks. As shown previously in Figure 3.1-1, unpredictable yields in food will lead to rapidly rising prices. Similar shocks have occurred throughout modern history, such as the 1973 oil crisis, driven by the abrupt decline in American oil production.

By following an objective design philosophy, we can very easily resolve these issues. Simply put, the systems which provide for society may be over-

engineered to the extent that they can perform far beyond the day-to-day requirements placed upon them, if required. In terms of engineering terminology, this is known as the factor of safety.

In engineering design, uncertainty surrounding a system is modelled by applying a factor to a certain aspect of system performance. For instance, if an item is expected to support a mass of 100kg, it may be designed to support 150kg (a factor of 150%); the more uncertain the circumstances, or the more safety critical the item is, the higher this factor may be.

Taking food production as an example, the approach may be laid out similarly. If a single, large farm is expected to satisfy the demand of 5,000 people, then, dependent upon levels of uncertainty, additional capacity may be designed into the system such that it is able to support 7,500 people (a factor of safety of 150%). In the event of an unusual circumstance, for instance the total failure of a nearby farm, or a massive sudden influx of people due to natural disaster or otherwise, this capacity may be exploited to maintain a service without severe consequences for the public.

In the case of the market, this kind of dormant capacity is fundamentally frowned upon, as the profitability of a system is the only prerogative. Therefore if additional capacity is identified and is present on a sustained basis, then the food production enterprise would downsize in order to cut the additional costs associated with this. Therefore the capacity to supply would shrink to meet the demand, satisfying the general trend of demand, but rendering itself unable to deal with any extreme circumstances. On the macroscopic scale, this results in catastrophic price shocks when unexpected surges in demand outstrip the supply.

Implementing this aspect into our hierarchical model, we can specify that each lower level, more safety critical system is required to satisfy a factor of safety in its design and maintenance, and until these factors of safety are adequately met, these critical systems remain a value priority.

The Managed Meta-Market

So how does the average citizen interact with this set of ranked values and prerogatives? Modern monetary capitalism is seemingly straightforward in that the medium of exchange is widely recognised and widely assumed to be neutral in its value stance. However we know from our assessment in part one that this is not the case. Conventional currencies have a very pronounced bias towards the individual, the short term and the pseudo-evolutionary.

This is an unfortunate collective irrationality which emerges from the enshrined axiom of competition, and the institutional politics that allows private banks to lend the money supply into existence. However, it leads to a useful demonstration that populations tend to follow the inherent biases of their currency, regardless of how absurd those biases may seem when scrutinised. The upshot of this is that a currency system can be designed which internalises the hierarchy of value that a society decides upon.

The fantastic work of the MetaCurrency project has already demonstrated how a decentralised currency system could work, and it is seductively simple. An online platform allows transferral of a wide variety of different currencies directly between individuals or businesses. Under this model, the provision of value by a party permits the immediate creation of a currency to represent that value, rather than having to become indebted, as is currently the case.

However, this process must be managed by a third party, in order to avoid fraudulent creation of currency. An online platform may have such a validation process built into its architecture. For significant transactions, a third party independent guarantor can oversee the exchange. Because the creation of currency is again unconstrained, the guarantor could also automatically earn a payment proportional to the transaction. Once the customer, the provider and the guarantor have agreed that the transaction is satisfactory, the trade may be validated and the currency exchanged. An automatic audit trail is maintained as each transaction is logged.

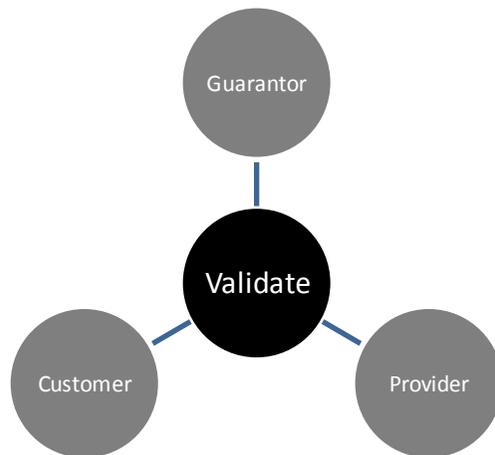


Figure 3.1-3: The basic validation model of currency creation - a proposed alternative to the indebtedness model in operation today

This very basic model can easily be expanded upon by modelling in the hierarchy of value. Each transaction may be categorised based upon what kind of discipline the work falls under. For example, payment to an individual working on the design of a new water filtration system would attract higher currency value than the development of a new line of furniture, or otherwise.

To avoid incorrect or fraudulent categorisation of work, a community peer review process may be implemented, such that the system becomes self policing. Again, participation in peer review of transactions could readily be encouraged by an automated payment of currency, as the creation of currency is unconstrained.

This unconstrained creation of currency has further benefits in terms of the provision of services. Production of the most basic needs, such as food or water, no longer become services which must be met with standing, ongoing costs to the population (via taxation or billing). Instead, the self evident requirement for these services mandates their upkeep, thus the value of their ongoing functionality is salient, and merely requires currency to represent it. Therefore, payment of those who choose to work in the upkeep, maintenance and improvement of these services is furnished from a currency pool which is inexhaustible, within boundaries defined by desired system performance.

Democratic - Scientific - Value Backed Decisions

So how do complex processes interlink within this online meta-market, and how are large scale endeavours undertaken? Within the market economy, important or large scale infrastructure work is funded by investment, based upon the presumption that this investment will offer long term returns. This process then subsequently battles against the various relevant legislative frameworks until a robust enough solution is reached.

The beauty of the value-backed currency model is that investment is not required in the conventional sense. All that is required is a demonstration of potential value. An individual may propose a daring new product, service or system. Once proposed, this may be perused, critiqued, corrected and enlarged by an active, open source crowd of vested or interested individuals. The open source scientific community might then propose specific boundaries, goals and performance requirements for the concept, before passing a review gate which allows currency to be automatically created and distributed based upon the peer reviewed proposal.

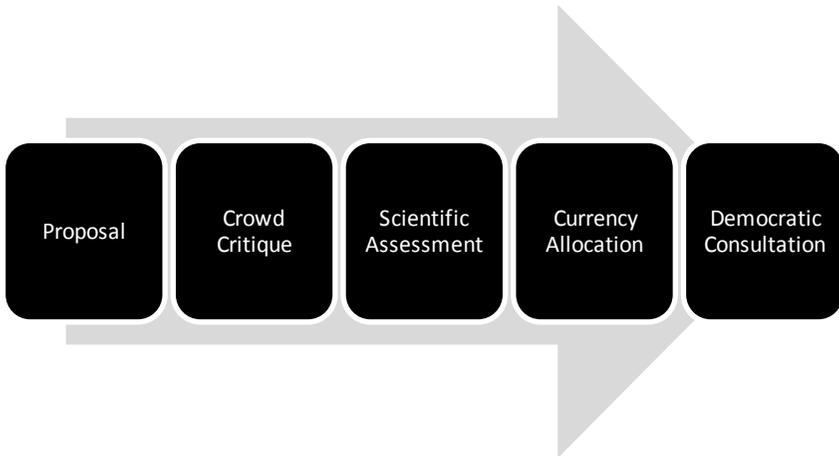


Figure 3.1-4: A basic proposal to implementation model - proposed alternative to the investment model in operation today.

Finally, the public may be consulted democratically in order to accept or reject certain 'soft' parameters, for instance the aesthetic appearance or design of a structure, the layout of a building, etc. Again, the magic of value backed currency creation is that every opinion offered to the development, either in the crowd critique, the open source scientific assessment or the democratic consultation, may be rewarded with currency. The reasoning behind this is that views, critique and assessments are valuable, and so they must be encouraged. The more critiques, the more value there is to the proposal, therefore currency may be automatically issued to represent this value.

What is important to note, is that a nearly identical process to this is what happens every day within successful corporations. Paid employees of the corporation are encouraged to come forward and share their thoughts of a particular concept or design, before experienced employees vet the idea and set specific goals and boundaries for it. Within a market paradigm, this process is considered acceptable as long as it is inside a commercial enterprise, but heretical when applied to the wider economy.

Worked Examples

This is all understandably hand-wavey, and I do not hesitate to admit that there are many unknowns within this proposed system for a realistic currency platform. For this reason, I have conjured a handful of 'hairy' example scenarios in order to illustrate how such a value backed currency platform may work in practise and under duress.

Ex.1: The Scarcity Example

A period of material shortage has descended on a region. There remains a reserve of 300 metric tonnes of steel, concrete and other miscellaneous construction materials that has yet to be earmarked for usage.

There are several issues currently affecting the region:

Construction has been proceeding on a new hospital to provide for the region, but progress has been slow, with just one of the three wings of the building nearing completion, and the remaining two lagging way behind schedule. The demand for this hospital is high due to a recent influx of population into the region over the past few years, and a resulting lack of adequate hospital and ambulance service coverage. This has put considerable strain on the emergency services in adjoining regions, who have been forced to absorb the additional volume.

The reservoirs and water filtration systems have been experiencing prolonged downtime, due to a combination of leakage and breakdowns, and faulty and aging equipment. This has resulted in the overall water supply system performing at a factor of safety of 1.23 times typical daily requirement, rather than the required 1.50. This reduced factor of safety has meant that water shortages have begun to occur during the heights of the hotter summer months.

The online currency platform currently has two proposed solutions to the water problem, both are currently at a stage where their public critique phase is coming to an end, and the ideas are technically robust enough to be vetted by the scientific peer review.

An additional proposal has been recently submitted which offers the opportunity to open the new hospital early, before the unfinished wings are completed. This proposal would provide adequate cover for the current population, allowing the hospital to be finished in the near future to meet the needs of the growing population. However it requires additional materials and labour to convert the finished wing of the building into a fully functioning hospital in its own right.

Each of the three proposals currently passing through the platform would exhaust the majority of the surplus materials, so only one may be selected. Who gets the materials, and how does the scenario play out?

Ex.1: The Scarcity Example - Answer

By referring to the hierarchy of value (Figure 3.1-2), the first part of the question is immediately obvious. The water system is upgraded, as this system outranks the hospital (healthcare). Without an adequate water supply, the hospital would be unable to function fully.

However which of the two proposals to upgrade the water system will get the go ahead in the future? This decision rests with the open peer review gate. Qualified scientists in the field are invited (with payment in currency) to consult the proposals, give recommendations, predictions of potential costs/benefits, and vet the proposal for robustness.

The outcome of this review process determines which of the options are granted currency to go ahead (again, this process is largely automated within the currency platform to prevent fraudulent or underhanded behaviour).

Ex.1: The Scarcity Example - Market Solution

As an interesting aside, the solution to this problem under a conventional market system is impossible to determine, as it is solely contingent upon the solvency of the investors in each field.

Should the utilities company possess greater liquidity, and be of the persuasion that an upgrade to the water system would offer a sufficient return on investment, then they will be more likely to keep up with the spiking prices of the scarce construction goods, and their repairs will go ahead.

If the healthcare firm (private or public) is in a better position, then they will likely take hold of the materials and progress construction.

Ex.2: The Ice Cream Example

A series of ice cream stalls are situated on a beach in a region of temperate climate. The weather in this region is typically unpredictable, and can vary between very sunny and very wet at quite short notice.

The primary raw material required to manufacture ice cream is milk; a basic foodstuff that is in fairly constant high demand. Milk production facilities in the region typically keep up with demand, but there is little extra capacity.

How does the milk get distributed between the ice cream stalls and the general food store? Who gets what?

Ex.2: The Ice Cream Example - Answer

Food is one of the basic requirements in the hierarchy of value, yet how production is distributed between different foods has not been discussed. The usefulness of an online currency platform which logs transactions across society is that demand can be passively assessed in an ongoing analysis.

As discussed, milk is a fairly basic, staple food, and its demand will typically be relatively high and relatively constant, as logged by the number of transactions per day. Additional detailed information relating to the demand for milk can quite readily be engineered into this loop by dynamic feedback. For instance, a facility may be added within food stores where customers log when the item they desired was unavailable, due to it being sold out or undersupplied.

Through this loop, producers can actively manage the demand and its rate of change over time. More undersupply logs flagged by customers indicate below par production performance, which would result in a system requirement to improve production, by increasing capacity, efficiency or otherwise.

Plateauing transaction rates in the face of rising production would indicate oversupply, and a necessity to ramp down production in order to prevent wastage. This demand response over time can be logged year on year, month on month and week on week to identify any microtrends and adjust production thusly.

An identical process can be applied to ice cream production, which will typically follow a strong seasonal variation, with a great deal of noise due to the changeable weather. By logging the needs for ice cream over time, dairy producers can coarsely predict when additional milk will be required to supply to the ice cream manufacturers. As this process matures, correlations can be drawn to other, more predictable factors, such as weather forecasts, etc.

The distribution of raw milk between ice cream and sundry milk may therefore be predicted as part of an equation which is constantly being refined with year on year trends. This approach allows efficient usage of materials and production facilities without the need for producers to sell in order to remain afloat.

Ex.3:The Nasty Example

A region has come under severe hardship due to ailing energy infrastructure. Power cuts have been commonplace, due to failure of the clean energy systems in the area not producing power on a sufficiently consistent basis.

Civil unrest has started to sporadically occur across the region, and while nobody has been seriously hurt yet, the public have proposed additional policing needs to be brought in to keep population wellbeing in the region above the required targets.

The additional policing requires 30 additional officers to be trained in riot combat and supplied with heavy duty riot equipment.

Two competing proposals are currently logged in the online currency platform as solutions to the energy shortage. One proposes the acquisition of a gas generator, which would produce sufficient energy to meet the region's demand, but it is dirty, smelly and polluting. The second proposal is expansion of the nearby wind and solar farm, and installation of deep charge batteries that would enable energy to be stored more efficiently. This proposal also meets the energy demand needs of the region, but would not be complete for at least 8 months.

The region currently only has sufficient resources to pursue one of the above options (including police training). What option does the region select?

Ex.3:The Nasty Example - Answer

As specified in the constitution at the beginning of part two, ecological drawdown of resources must not be relied upon in order to power the energy requirements of civilisation. Furthermore, the usage of polluting fuel sources must also be recognised as a threat to ongoing human survival, due to the ongoing emergent costs associated with such.

Therefore, it is only in the most unpleasant of scenarios that such a choice must be made. How does this reflect itself in the hierarchy of value? As energy is a basic, high priority system, it must take priority over any lesser system. In this case, law and order, while nice to have in this difficult situation, is a distinct second place behind keeping the lights on, and keeping the population warm and comfortable. A meliorating the public's concerns in this regard is likely to have a

more effective outcome than simply placing more police amongst them in isolation.

However, as discussed, energy system performance must be measured in relation to targets. These targets in reality must be nested within a hierarchy themselves. A performance rating relating to pollution and drawdown of rare resources absolutely must be included, but so long as poor performance ratings against these targets are not sustained in the long term, they are ultimately preferable to the case of blackouts and widespread panic.

In this case, the power system is not providing adequate power to the population, so this priority must be addressed first by acquiring the dirty source of energy (the gas generator). Once this is in place, the priority then shifts to the environmental impact of the generator (energy performance remains the priority, but in relation to a different target). The long term goal then becomes to gradually replace the dirty energy source with the upgraded clean energy sources.

Of course, this is a very extreme example, and it is unlikely that a region would be so stricken by material and personnel shortage that it could not tackle the three issues near-simultaneously, but the example is good as an illustration of how post-market forces could navigate even the most torrid of scenarios.

Caveats

This is of course a very rough view of what a post-market economic system might look like. Again, with a scientific worldview, we can never be sure exactly what system would generate an effective and efficient society. It is hoped therefore that the coarse view put forth in this chapter has presented some interesting ideas that you may wish to expand upon with your own thought experiments.

What is however obvious from the above examples, is that the economic calculation problem, that free market proponents so often regard as their silver bullet against rival economic theory, is very much soluble by other means.

Chapter 3.1 - References and Notes

- [1]. UNEP (2014) *Decoupling 2 : technologies, opportunities and policy options. A Report of the Working Group on Decoupling to the International Resource Panel*, pg25

3.2 Technological Development

BY PROVIDING a value backed economic model similar to the framework described in the previous chapter, a whole new realm of unexplored possibilities emerge. The creation of a robust value backed system of currency allows many endeavours that would be considered too costly, too long term, or too unmarketable under a market paradigm to be pursued with impunity.

With reference back to our chapters on unemployment and debt accumulation in the first section of the book, we find that not only is valuable skill stifled by a slumped labour market, but tasks that are in sore need of completion lie undisturbed due to a lack of liquid money.

For example, infrastructure within the USA lies in a squalid state^[1] despite youth unemployment being rife. If some economic deity were able to spirit billions of dollars into the state coffers overnight (without the economists panicking over their concept of inflation), then these problems could be remedied by sprawling projects employing and developing tens of thousands of people.

This chapter will therefore focus on the possible developments that would be permitted to occur under this post-market economic system that allows value to be modelled without debt. We must of course sidestep any speculation upon technological progress, else this chapter would descend into facetious utopian pornography. As such, only prior proposed technological developments will count, and only those from reputable sources.

Never the less, the benefits offered by an economic system which enshrines inherent value, rather than superficial individualism are astounding, and serve as a powerful wake up call to those who would claim that the market incentive is the most effective stimulus of innovation.

Economic Inventory

In 2009, Hewlett Packard's subsidiary HP Labs set out its plans to design what it called the "Central Nervous System for the Earth" (CeNSE). This project would involve the creation of trillions of highly accurate, yet cheap and innocuous sensors, that could be placed in objects in order to measure various rudimentary statistics, such as vibration, movement, temperature^[2] etc.

HP are however not alone. Tech giant IBM has joined in the race to create a world wide sensor system, and has already entered into several joint ventures to add real-time sensors to food shipments and car components^[3].

The larger picture surrounding these proposals is what has come to be known as "*The Internet of Things*" and it offers some incredibly important insight into how we use the items we produce. Under a market paradigm, a gigantic amount of performance and usage data grants those who can view it a powerful advantage, but the benefits are limited by the inherent protectionist nature of competing firms. Under a system where currency can be democratically issued in a freeform manner, as part of an automated, open source online platform, the power of this data becomes immeasurable.

Data relating to usage or performance of systems and products may be fed back into the currency platform in order to dynamically control supply and demand based upon simple algorithms*. For example, mundane personal belongings may anonymously return data relating to their usage right the way through their lifespan. Items which cease to work and are discarded may be tracked as to when they enter the waste system, allowing a full, lifelong image of the typical usage of the item, and whether the lifespan is sufficient. Items which break, or are discarded early on in their lifespan may incur automatic penalties through the currency system, affecting the price of further units or otherwise.

Performance data of more technical items may also be collected, ensuring that adherence to system design parameters are maintained throughout the lifespan. Highly detailed energy usage breakdowns may also be produced, allowing for more intelligent design surrounding how items are used in ways that manufacturers had not foreseen.

Again, none of this is necessarily new, but the piecemeal manner in which the market applies such technology does not allow a consistency across society.

* *In the previous chapter, such a system was used to log the demand of milk and ice cream in order to rationally distribute raw materials between the two products.*

Highly prestigious, or highly safety critical items (such as Rolls Royces or commercial airliners) may see a level of lifecycle analysis of this order, but low budget items are frequently forgotten by the manufacturer as soon as they leave the factory. This may make sense in a competitive, individualist environment, but in order to stave off the collective wastefulness of this absurdity, some level of cohesion between data and currency is required. A value backed, freeform currency platform allows this cohesion to become reality.

Material Selection and Flows

The provision of a raft of low cost, effective sensory equipment need not be constrained to the demand side of the equation. Like the end user, the manufacturer may also be privy to large amounts of data relating to raw materials, energy etc.

The current market system is propped up by ever increasing extraction rates of raw materials in order to drive a cycle of consumption. This allows the quick and cheap production of items, but it says nothing for sustainability. Rising steel production rates signify little more than more iron ore being pulled from the ground, yet under a market system this is heralded with falling prices and a greater impetus to consume steel goods.

By creating a sensor system which not only actively monitors items during their lifespan, but also into their disposal and recycling, we create an unprecedented inventory of material flow. Using steel again as an example, we may gather data telling us that 3,000 items entered the recycling system last week, 9 tonnes by mass of which is steel.

We therefore know that, in order for manufacturing processes to remain sustainable, on average, steel production must not exceed the mass of recycled steel deposited in the waste management systems (by a certain factor). On a global scale, with this massive amount of data at hand, the raw material industry would finally be able to actually balance its books objectively, by ensuring that production rates do not exceed recycled deposits.

Should demand force the steel producers to rely on extracted iron ore reserves, the automated currency platform could prompt creation of liquid currency in exchange for individuals recycling their unused steel goods. This is essentially what would happen under a conventional market system*, except in real time,

* *A drop in the availability of steel under a market system would typically see the market react by offering better prices for used steel products, however this would largely be after shortages have already manifested.*

and in terms of rates rather than stock. The difference is that a managed sustainable process could be maintained, rather than a chaotic oscillation in price shocks.

Transport

According to the Association for Safe International Road Travel, 1.3 million people die in road crashes each year, and an additional 20-50 million suffer serious injury or disability^[4]. Road traffic crashes rank as the 9th leading cause of death, and cost USD \$518 billion globally^[5]. Despite this enormous death toll, transportation the world over remains dominated by the traditional motor car.

To an outsider, our species' infatuation with the motor car might seem strange. The car is dangerous (as we have established), it is inefficient, polluting and requires the constant care and attention of its pilot. The typical car spends a tremendous proportion of its life motionless and unused, it requires upkeep by the owner, and its passenger seats are almost always empty. Furthermore, as much as 24-38% of our inner city land area is dedicated to car parking^[6].

Yet upon a deeper examination of history, the root cause for our love affair with the car becomes obvious. The car has been, and continues to be, an undisputed victory for the consumerism movement. The portrayal of the car as a status symbol, an expression of freedom, and an exclusive luxury has been central to the marketability of cars since their invention. Even behind the humblest of budget cars (the first Volkswagen for example), an alluring backdrop of implicit prosperity and liberation is readily apparent.

Yet all of this is irrelevant when considering that the car is an objectively poor mechanism of transport for the population; one which offers significant costs, and meagre benefits. Within the USA, motor vehicles produce one fifth of all CO₂ emissions^[7], yet despite this, large American cities spend a majority of their time gridlocked. Los Angeles drivers are particularly badly affected, with those who have a 30-minute commute spending an average of 90 hours a year sitting motionless in traffic^[8].

In Europe, the scene is only marginally better, with large cities like London barely breaking into a double digit average driving speed (11.8mph). Even more compact, less populated capitals, like Berlin and Warsaw only just manage average speeds above 15mph^[9].

The dependence upon the motor car for transportation has not only contributed to the pollution and congestion within cities, but has also permeated the very

structure of how cities develop. Older cities which developed centuries prior to the advent of the motor car (such as those in Europe) typically feature shorter car journeys on average, primarily due to their older layouts not favouring large scale car transport. Cities in the new world however (Canada, USA, Australia) are far younger, and were more readily adapted to car transport as they grew. As such, many possess significantly more developed road systems^[10].

The result of this seems intuitively positive, however the reality of this road centred development of cities has actually increased the usage of cars by encouraging cities to grow with lower urban densities. The reduced density of these cities results in travel from further afield, to work, to shops, to entertainment complexes etc. The correlation of this urban density with car usage is shown in Figure 3.2-1.

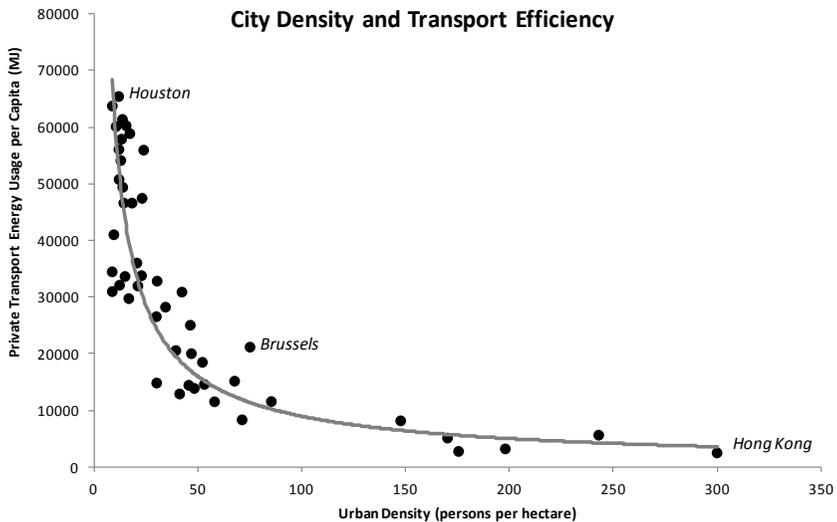


Figure 3.2-1: Urban density vs. private transport energy expenditure (car usage) - Adapted by author from [11]

The highly populated cities of Asia outperform even the European cities in terms of private transport usage per capita, with their large populations relying more heavily on integrated public transport systems. However there is more to consider here, as while the conduciveness of city road infrastructure for the motor car is a factor, the distribution of services within the city have a powerful effect.

Figure 3.2-2 shows the distribution of cafes in Paris, France as compared to Pittsburgh, USA. Kent Larson of the MIT City Science Initiative has presented much work on this topic, relating to a 'golden' 20 minute walk diameter, which typically governed the maximum size of villages prior to the motor car. When these villages coalesced into a single conurbation, the individual, self-contained service distribution of the villages remained largely intact. This is the case in Paris, in which the seven Arrondissements (districts) of the city evolved separately as towns with this special 20 minute walk diameter. Larson has coined this generic diameter as the 'Compact Urban Cell'^[13].

Cities that evolved alongside the motor car however, such as Pittsburgh in Figure 3.2-2, instead are divided into districts which are not internally self contained in terms of service distribution. As such, populations must drive to dedicated areas of the city for certain services. By combining this finding with the correlation of cities with private transport energy expenditure in Figure 3.2-1, we stumble upon an interesting conclusion.

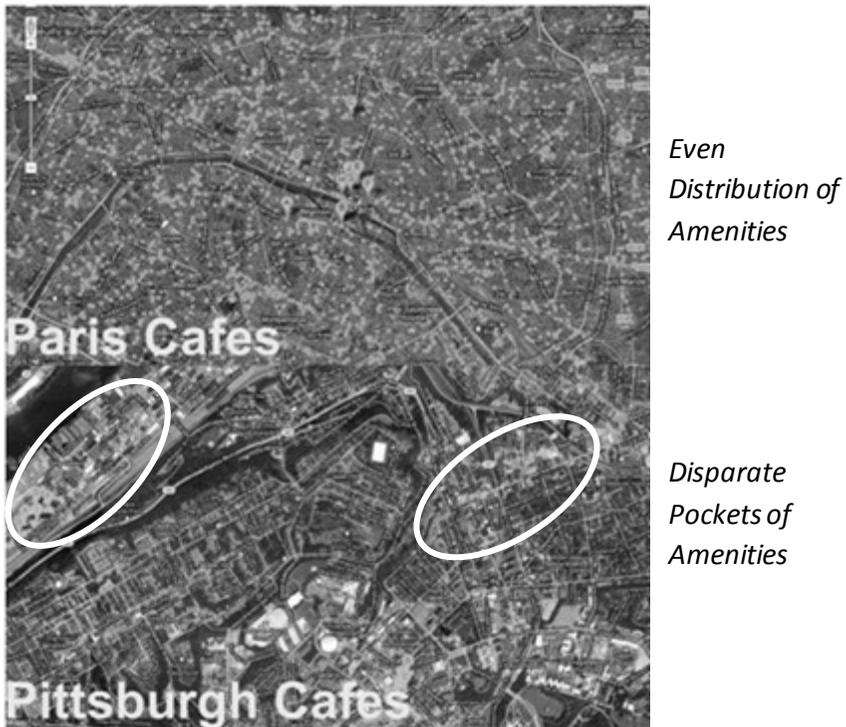


Figure 3.2-2: Distribution of Pittsburgh vs. Paris cafe distribution - Adapted by author from [12]

What this shows is that when individuals are not required to travel by car to access certain services, they typically do not, and instead rely upon local options on foot, or by bicycle. As proposed by Kent Larson, the efficient transport behaviour of highly population dense cities can be mimicked by clustering services in bubbles of high density, thus removing the requirement for populations to travel^[13].

The misfortune of this approach is that the motor car maintains a powerful economic presence in modern society, both in terms of GDP and in its beguiling status image for the consumer. It therefore remains an aspect of society that few want to get rid of.

The advantage of an unconstrained currency platform which can be tethered to value becomes a tremendous boon in this scenario. It is clear that the energy relative efficiency of the European and Asian cities, in relation to the newer, car centred cities is a valuable and envious circumstance in a world of pollution and global warming. The logical step can therefore be made that greater usage of integrated public transport systems is inherently valuable, due to its greater efficiency.

The solution to the reliance on the car is therefore quite simple, but highly counter-intuitive within our market model - a pool of currency may be created for each citizen which would be paid to them if they use public transport. This is especially interesting, as it is the exact reverse of what we do today.

Obviously, automated boundaries must be placed upon these payments, to prevent individuals riding the train constantly to make themselves wealthy, but the economic impetus to board the train for their commute or shopping will be difficult for many to turn down. As such, the city design can be shaped around an objectively valuable end circumstance, rather than the individualistic, chaotic and fetishised influence of the motor car.

In the same way, the valuable structure of hyper dense sub-regions within the city, providing a population's needs while minimising their day to day private travel needs may be incentivised in a similar way; by creating currency priorities within the value hierarchy that prioritise denser service distributions over more diffuse ones. For example, performance parameters such as pharmacists per capita, or per sq mile may be monitored. This data, coupled with usage statistics of each outlet, may be used to paint a highly accurate picture of local population needs, while simultaneously prioritising dense, low transport demand service distributions.

By incorporating smart design principals into urban areas, architects and city planners can actively reduce the demand for public and private transport. In the city of Boulder Colorado, or Seoul, South Korea for example, designers have created a pedestrian highway, which allows people on foot and by bicycle to travel the full width of the city centre without having to cross a street, or navigate around road interchanges. The results have shown that reliance upon the motor car and public transport have reduced significantly^[14].

For journeys within the city that cannot be done on foot, light rail and metro have proven themselves to be highly effective methods of transportation to serve urban and sub-urban areas. The Hong Kong MTR Metro is lauded internationally for its 99.9% service reliability, its 24/7 service every day of the year, and its capacity to carry well over a billion people per year^[15]. The performance of Hong Kong in terms of transport energy expenditure can be directly correlated to the success of its metro system; as shown in Figure 3.2-1, Hong Kong expends significantly less energy per capita for transport of its population when compared to other cities.

The mass transit system however must be applied with scientific intent, rather than based upon economic reasoning. Under market forces, transit systems are made or broken based solely upon their profitability, or through governmental pressure. Neither of these approaches can offer an understanding as to whether a proposed mass transit system is efficient enough to meet requisite targets relating to emissions or energy consumption.

Benoit Lefevre of the World Resources Institute has written about this topic at great length, correlating transport efficiency not only with urban density, but also with geographical topology. The correlation is shown in Figure 3.2-3, suggesting that not only is urban density a factor that transit designers must consider, but also the uneven distribution of urban geographical features^[16].

The best case study is shown in Figure 3.2-4, showing the geographical distribution of population in Atlanta and Barcelona, two cities with similar populations. Atlanta shows a very polycentric layout, with numerous centres and sprawling suburban areas. Barcelona shows a compact, monocentric layout, with the majority of the population clustered around a single region.

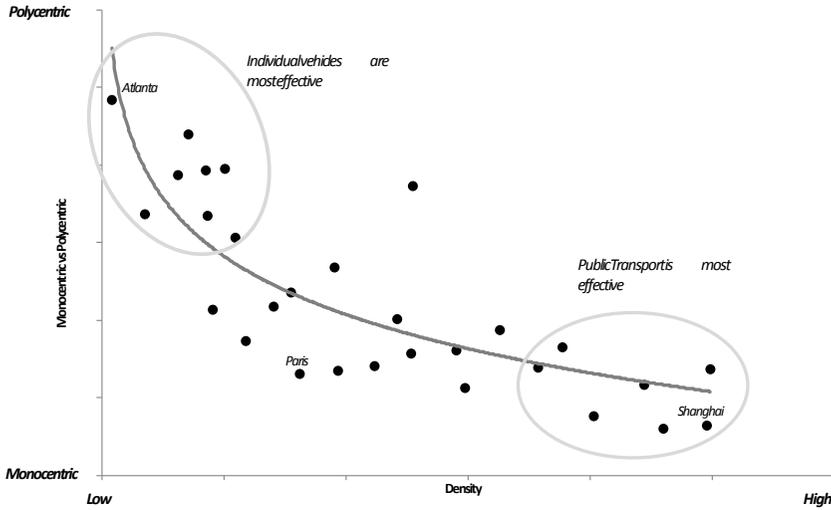


Figure 3.2-3: High vs. Low density, and Mono vs. Poly-centric city layouts - Adapted by author from [16]

Without significant restructuring of the city to meet the ideal of Larson's Compact Urban Cell, mass transit in Atlanta would be woefully inefficient, as it would have to cater for a much more dispersed population distribution. Barcelona on the other hand is much more conducive of the mass transit system, and is already performing well with such systems in place.

So what of Atlanta? How can a city of this form overcome its woeful energy inefficiency? In the short term, a city such as Atlanta could drastically reduce its energy expenditure through simple car access systems. Such a system has already been developed by Basque firm Hiriko, who have created a small, efficient folding car that may be used for short city journeys, and then folded into a very small storage form^[18]. By creating a series of storage nodes around areas of the city where cars of these type could be left to charge, prospective passengers could use a vehicle for their journey, and then leave it for others to use at their destination.

Furthermore, under a value backed currency platform, individuals could be paid in currency for not only taking these public cars, but also sharing with passengers. Kent Larson has estimated that this kind of car sharing approach, combined with expanding similar schemes relating to semi-powered bicycles, could potentially cut the transport energy expenditure of a city up to 28 times^[19].

That is certainly a valuable outcome, so why is there no currency within our market system to incentivise it?

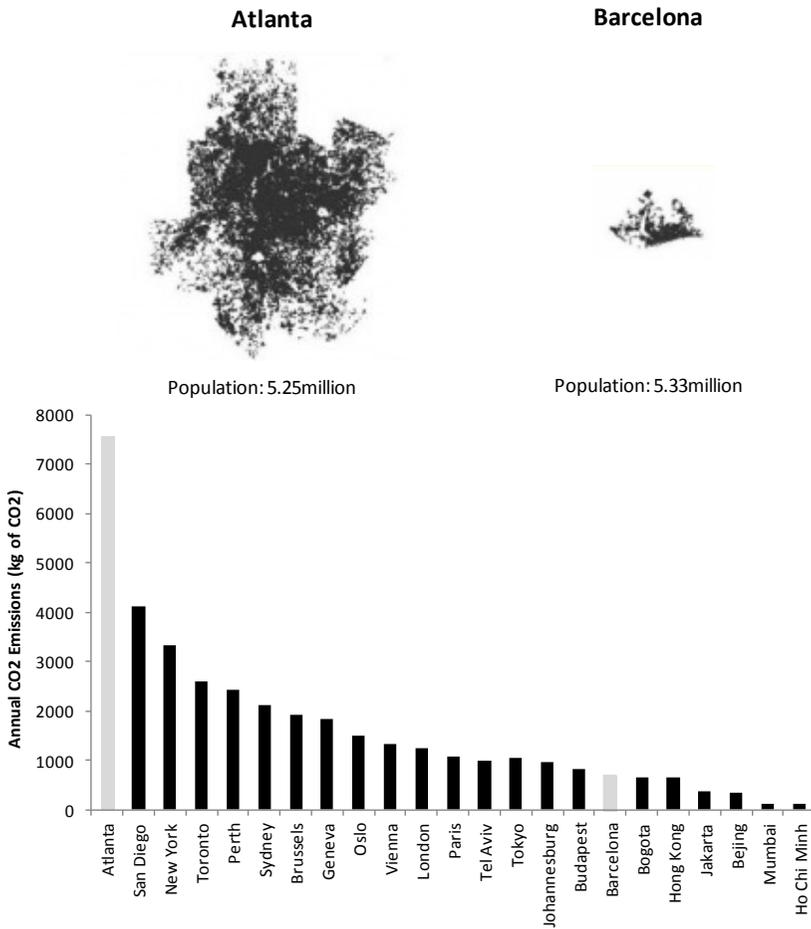


Figure 3.2-4: Case of Atlanta, USA, vs. Barcelona, Spain - Urban structure and population - Adapted by author from [17]

Beyond metropolitan areas, medium distance travel remains similarly dominated by the motor car, but with stiff competition from rail. Train based transport remains highly inconsistent and variable across national boundaries, with significant differences in average train speed and infrastructure reliability.

Despite this, even aging diesel-electric passenger rail systems emit approximately half the carbon dioxide per passenger-km of cars, and their performance has improved significantly in the past few decades. Further analysis

of average train efficiency has shown that energy consumption per passenger-km can vary between as much as 350KJ per passenger-km, to as low as 77KJ per passenger-km. Considering that an average car with efficiency of 47MPG would perform at approximately 1,500KJ per passenger-km, the benefits of rail in medium distance journeys are readily apparent^[20].

Long range travel remains an even more unwieldy issue in the modern economy. Air traffic has exploded in volume since the onset of the jet age, with some 2.9 billion people taking to the air in 2012 alone^[21]. This trend looks to accelerate in the future, with airliner manufacturer Boeing predicting that there is a requirement for up to 25,000 small jets by 2033^[22].

Despite this surge in demand, air travel remains a fundamentally unsustainable model of transportation, which relies upon drawdown hydrocarbon energy. While inroads are being made into biofuels being used within propulsion systems, the focus of modern aerospace projects remains on the development of incremental efficiency improvements, such as aerodynamic devices, advanced engines and more effective air traffic control management. While there is merit in all of these, the bare truth remains that aircraft, no matter how efficient, are still burning jet fuel which is refined from rapidly depleting resources.

Furthermore, the IPCC has estimated that aviation is responsible for around 3.5% of anthropogenic climate change, a figure which includes both CO₂ and non-CO₂ induced effects (other pollutants, and contribution to cloud formation, etc.). The IPCC has also produced scenarios estimating what this figure could be in 2050, with the central case estimate predicting that aviation's contribution could grow to 5% of the total^[23].

Despite the focus of the aerospace industry on piecemeal and incremental improvements, revolutionary projects are in existence, but are constantly beset by difficulty due to the availability of cheap fossil fuel energy for propulsion.

The LAPCAT A2, designed by Reaction Engines Ltd, is a high speed, high capacity conceptual airliner which is able to travel between any two points on the globe within a 5hr window. The A2 is projected to achieve this by cruising at anywhere between Mach 5 and Mach 8. The A2 features 4 revolutionary Scimitar engines (a simplified version of the Sabre air-breathing rocket engine which will power the in-development Sky lion spaceplane)^[24].

The engines differ from conventional jets in that they use hydrogen as their fuel source, rather than Jet A1 kerosene. The advantage of hydrogen fuel from a

sustainability perspective is obvious, as while kerosene is a refined fossil fuel which emits greenhouse gases when combusted, hydrogen is produced from water, and its emissions when combusted are water vapour. Hydrogen of course requires energy to be produced from water, but so long as this energy is taken from sustainable sources (wind or solar electricity for example) the fuel is essentially a zero emission power source.

The potential of the A2's projected performance is therefore mind boggling, and initial tests of the critical components of the Sabre / Scimitar engine design have already confirmed the feasibility of the engine (the European Space Agency additionally audited the tests and found the results to be as claimed^[25]). However the project languishes in funding difficulties, with an estimated £200million needed to build a full scale engine demonstrator. The UK government has chipped in £60million of this, but progressing such an audacious design on a shoe string budget has proven difficult^[26]. The tentativeness of investors, and their desire to see timely returns on investment has ultimately delayed, hampered and impeded the progress of a project that has economic and environmental benefits far beyond any other in the transport industry.

Under a value backed economy, these investment woes would not be as crippling, as the potential of the project could be realised simply based upon its scientific credentials. As confirmed by the ESA, these credentials are already validated, so there should be little stopping the project from progressing into the final design stages.

Elsewhere, other long range transport systems offer benefits that may complement or supersede air travel. While high speed, Magnetically Levitated (maglev) trains already exist and are in service today, their technology has not yet been exploited to its fullest potential. One of the more ambitious advocates of maglev as a long range transportation system is the ET3 collective, which has proposed a system of interlinked, above ground tube networks.

Within these tubes, the atmosphere is rarefied to a near-vacuum, allowing maglev shuttles to travel at speeds and efficiencies that air resistance would typically prohibit. Like Elon Musk's proposed Hyperloop, the ET3 is an on demand travel system, meaning that passengers would take a carriage to whatever destination on the network they desire. This system does away with the convention of timed services based upon timetables, and thus allows transportation energy expenditure to more readily match demand, rather than aircraft or trains operating with empty seats.

Despite ET3's potential as a fast, efficient and passenger friendly transport network, under a market economy, such a large scale global investment seems unlikely. Furthermore, as with the revolutionary Sabre engine, the investment community can see much more fruitful uses for their money in the realm of financial products, and therefore have largely stayed on the sidelines despite the robustness of ET3's scientific acumen.

It is therefore clear that, by applying a scientific approach to our transportation system, and following a beguilingly simple set of heuristics backed by real value, the vast problems of our transport infrastructure's pollution and energy wastage are entirely soluble.

Energy

The centrality of energy to human civilisation is obvious. While we have discussed energy extensively in reference to energy efficient transport systems, such transport would be utterly useless if the energy provided to it was unreliable, dirty or unsustainable. As such, a reliable backbone of energy supply is crucial in every regard.

Yet despite this, a study by the Lawrence Livermore National Laboratory in the USA found that in 2012, the USA was only approximately 39% efficient. Of the 95 quadrillion British Thermal Units of energy (known as a 'quad') available, only 37 quads were ultimately used in a constructive application (as “energy services”). The other 58.1 quads were, in essence, wasted^[27]. This waste, summarized in the top right of the diagram in Figure 3.2-5, is classified as “rejected energy.” Given the looming shortage of fossil fuel reserves, this lack of efficiency within the energy system poses a problem.

Energy in the developed world remains a highly centralised affair, with the USA obtaining nearly half of its generated electricity from large coal power plants as of 2011. A further quarter of generated electricity is obtained from natural gas plants, and nearly 20% from nuclear plants^[28].

The centralisation of energy production is historically associated with the rise of dedicated energy companies (private and public) who exist solely to produce and sell electricity to the general population. This however is a relative oddity in history, as much energy production in pre-industrial times took place in the home, by burning locally sourced materials of whatever form. Of course, returning to this exact scenario today is infeasible, but the broad philosophy of generating energy where it is needed is a valuable one, given the woeful

dependency of the USA and other developed countries on centralised, dirty and unsustainable fossil fuel power.

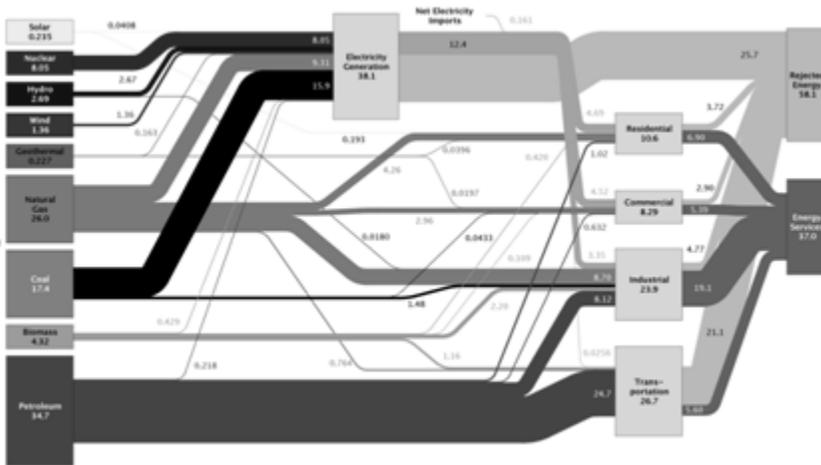


Figure 3.2-5: Energy breakdown of the USA - Adapted by author from [27]

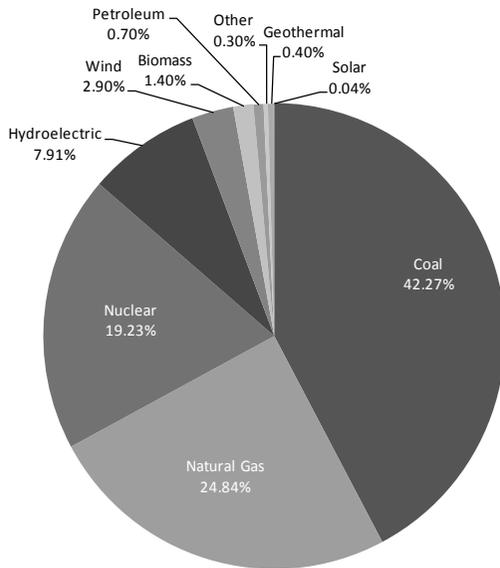


Figure 3.2-6: Energy generation in the USA - Adapted by author from [28]

Furthermore, the centralisation of energy production also necessitates the transportation of fuel. Railroad transport accounts for more than 70% of U.S. coal destined to the electric power sector, and estimates show that transportation costs on average contributed to 40% of the overall cost of coal delivered at electric power plants in 2010^[29].

Although the idea may seem absurd, shipping hundreds of thousands of tonnes of coal over vast distances to a power plant, only to distribute the energy from this coal back out across the grid actually has a rationale behind it. The energy that is used to power your television or computer is energy that has been generated very recently, as the typical power grid within a nation is primarily based upon alternating current (AC) electricity. This type of electricity is useful in many regards, but it requires complex conversion processes in order to be stored for usage at a later time. As such, the overwhelming majority of power consumed by the typical individual is provided directly from the power station almost immediately after it was generated.

Power grids deal with any variation in energy demand by maintaining the near constant usage of a series of large (usually coal or nuclear) plants which provide the average 'base load' - the electricity demand which does not vary significantly over time. For day-to-day or seasonal variation in power demand, faster responding plants are brought online to top up the supply of 'peak load' - these will typically be natural gas plants.

This management system of our power usage evolved from the centralised, economies of scale of the industrial revolution, when unlimited fossil fuel energy precluded any requirement for intelligent usage. However the result is that as sustainable sources are increasingly required to be included within our energy production, they find themselves stifled by the lack of flexibility within the existing grids.

The sheer absurdity of this has resulted in wind farms in the UK being paid as much as £30m per year by the National Grid to deactivate their turbines and stop producing electricity, simply due to the fact that the demand for power at that time was not high enough to merit their operation^[30].

Numerous technologies currently exist that can be used to store energy in some form, and with energy storage making up just 2% of U.S. electric generation capacity^[31], there is certainly scope for these technologies to unlock a game-changing revolution in energy production. However much of these technologies languish with lack of funding, or confusion as to how such storage capacity can

be implemented around existing energy contracts. Philipp Grünewald of the UK Energy Research Council and the Energy Futures Laboratory has spoken about this reluctance of both energy suppliers and distribution companies to invest in storage technology, due to them each believing that it is not their responsibility.

"[W]ho will build, own and run these storage facilities? Grünewald said that this could be a major sticking-point. 'I've been looking into this, and it's a bit like a carousel,' he said. 'I asked the generators if they'd be willing to build storage capacity, and they don't think it's their responsibility; they think it's a network function. And if you ask the network operators, they say that government regulations say that they're not allowed to own generating capacity and storage, ironically, is classified as generating capacity; but if someone were to offer it as a contract service, such as a demand aggregator, they'd be happy to pay for it. So I spoke to them, and they said they'd be happy to offer the service, but they aren't in the business of investing in capital-intensive equipment and the intermittency wasn't their problem, so why didn't I talk to the generators? And so around it goes.' "^[32]

Furthermore, the issue becomes deeper with the entanglement of different private energy producers dealing with each other when storing energy.

"One problem might be that there is no organisation which can negotiate between different companies: if there's a need to link four windfarms which are owned by different operators, who pays for the storage and who builds it? And then, Grünewald added, there's the issue of what the contracts might look like, and how to handle competing interest. This is currently being investigated by Scottish and Southern Energy, he said, which is trying to set up a storage scheme in Orkney. SSE is providing an 11kV network access point, and inviting potential storage providers to build capacity alongside Kirkwall Power Station; the question of the commercial contracts, and how they can be set up to provide an incentive for the storage providers, could prove a sticking-point to whether anyone comes forward with a proposal." "^[32]

The issue remains a clear collective irrationality. From the individualist perspective of the energy provider, the prerogative is to simply produce energy and sell it to the grid. It is for this reason that wind companies claim compensation when their energy is not purchased due to lack of demand.

From the grid distribution company's perspective, they are simply employed by governments to manage the grid. Where they purchase energy from is largely inconsequential, so long as demand is met. Thus purchasing energy on-demand from base-load style and peak-load style stations is favourable when compared to the large scale grid infrastructure upgrade that would be required to store energy in an effective manner.

Breaking away from the conventional market-government hybrid approach to energy generation yields simple answers to these issues. Under a hierarchy of value model, energy is a high priority system. Within the overall energy system, several performance metrics can be defined, such as for example, stability, reliability, wastage, renewability of energy resources, etc.

Each of these performance parameters may be ranked in order of urgency. As such, within the energy system, performance parameters which are not being met may be prioritised by creation of currency. This currency then becomes allocated to proposed projects that offer solutions to the poor performance metrics.

This allocation of currency would allow those technologies that offer energy storage solutions to be developed through their proof of concept phase and implemented in the grid where poor performance metrics are more pronounced.

The development of a true smart grid subsequently becomes a gradual process of refining performance parameters, through general implementation of emerging technologies. By basing development of this energy infrastructure on raw performance data, we preclude the absurd requirement of waiting for non-renewable fossil fuels to become so uncompetitive that the energy supplier markets are forced to rapidly scramble to find alternative solutions.

So what would this smart energy grid look like? A robust and diverse collection of energy storing options exist in various forms of development, and all offer tremendous potential value to the global energy supply, but how does it all come together? The first step in exploiting renewable energy to the fullest is undoubtedly to create a robust and flexible system of energy storage, some of the current developments of which will be summarised presently.

NASA have developed an ingenious solution to the energy storage question by using electricity to spin large flywheels in near zero friction vacuums. The electricity may then be extracted from the fly wheel when needed by gearing the

axle to a dynamo. This method offers very high efficiencies, but is currently economically infeasible due to the requirement for a near-vacuum^[33].

Batteries also offer significant potential for storage. Australia's national research body, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) has developed a battery which will tolerate high charge and discharge levels, and very large numbers of cycles during its lifetime, outperforming previous lead-acid cells by more than an order of magnitude. This means it can operate continuously in intermediate levels of charge, unlike traditional lead-acid batteries which are typically held at full charge before being discharged. With these advanced batteries, efficiencies up to 90% are possible^[34].

Aside from direct storage of electrical energy, the potential of hydrogen as a storage medium is also impressive. By using grid electricity to power water electrolysis processes, hydrogen can be created at high efficiencies, stored, transported, and then burned to release energy when required.

By developing a grid which stores and releases energy intelligently, renewable and intermittent sources of power become significantly more viable. Of these, wind is perhaps the most visible and advanced renewable resource, with high penetration rates across Europe (39% of grid electricity production in Denmark (2014), 19% in Portugal (2011), 16% in Spain (2011), 16% in Ireland (2012), United Kingdom (2014) - 9.3% and 8% in Germany (2011))^[35]. With these kinds of generation rates, despite the difficulty integrating intermittent wind energy into the on-demand grid, it is very feasible to see wind producing the majority of national energy in Northern Europe without issue.

However the evolution of wind energy also lies beyond the conventional windfarm. Mexican architect Agustin Otegui has proposed the creation of outer cladding for skyscrapers, which is made of a framework of almost imperceptible tiny wind turbines. The result is a living skin which rustles in the wind whilst harvesting energy for use in the interior. By retrofitting existing buildings with this material, efficient wind energy can be produced in-situ without the invasive presence of large, whirring turbines^[36].

With the existence of a smart energy storage system of infrastructure, wind can further be supplemented by solar energy. In 2014, the International Energy Agency predicted that worldwide solar capacity offers the potential to generate 27% of global electricity as early as 2050. Of this, 16% may be obtained from photovoltaic panels (directly converting solar energy to electricity) and 11%

from Concentrated Solar Power (using mirrors to focus beams of solar energy and heat an element)^[37].

Daniel G. Nocera, Professor of Energy at Harvard has further offered new possibilities in the realm of solar power by creating a prototype artificial leaf which mimics plant photosynthesis. When dropped into a jar of water in the sunlight, the artificial leaf releases hydrogen that can be used in fuel cells or engines to produce energy^[38].

Nocera's early prototypes used the rare metal platinum to act as the catalyst for the process, but this has since been replaced with a less-expensive nickel-molybdenum-zinc compound and a cobalt alloy. Nocera notes that all of these materials are abundant on Earth and allow the mass production of such 'leaves' to microgenerate significant amounts of fuel and electricity^[38].

Ocean energy further presents some beguiling and fascinating opportunities in terms of energy generation. Of these, ocean salinity is perhaps the most obscure. Two primary concepts for converting the gradients of salt concentration in seawater into electricity have been identified (Reversed Electro dialysis and Pressure Retarded Osmosis). On global basis these technologies have been predicted to offer as much as 1,600 TWh of electricity per year^[39].

Even greater still is the potential of tidal energy, deriving from height changes in sea level due to the gravitational attraction of the moon on large water bodies. The rise and fall of the tide offers the opportunity to trap a high tide behind a barrage or fence, and then exhaust the potential energy through a turbine before the next tidal cycle. The worldwide theoretical power of tidal power has been estimated at a staggering 7,800 TWh per year^[40].

Ocean thermal energy offers additional potential, by drawing energy from the differential temperatures of deep, cold water and warmer surface water. Orders of magnitude from 3 up to 10 TW are possible^[41].

Geothermal energy also offers an almost unimaginably large untapped energy supply by acting to take advantage of the fact that 99% of the Earth is at a temperature over 100°C. The Earth's internal thermal energy (from gravitational accretion and radioactive decay of minerals) flows to the surface by conduction at a rate of 44.2 TW and is continuously replenished at a rate of 30TW^[43]. This is over double humanity's current energy consumption. By tapping into just a fraction of this energy flow, a tremendous amount of power can be generated. Furthermore, while the gradual cooling of the planet is occurring on long term

geological timescales, exploitation of these thermal reserves for human power generation has negligible effect on the gradual cooling rate of the planet, and so may be considered to be largely sustainable on geological timescales^[42].

Given the incredible variety of energy sources* available to humankind, it is clear that there is no energy crisis to speak of. The crisis is instead a result of the market's inability to react to changing circumstances with any degree of foresight. Furthermore, the individualistic nature of our governments and energy companies makes the development of systemic infrastructure (as banal as storing energy rather than cutting it off) incredibly difficult. Under a system of currency which actually represents value, these decisions become straightforward.

Food

The production and distribution of food is also a significant issue within the modern economy. Despite the political pressure to reduce emissions in the energy and transport sectors, it has been estimated that livestock and farm animals contribute nearly 20% of global greenhouse gas emissions^[44]. The rearing of animals for meat is an incredibly inefficient process in terms of generating food for a population, as it typically requires up to 2,400 gallons of fresh water to produce one lb of red meat, compared to just 25 gallons of water for one lb of grain^[45].

This extreme expense is due to the fact that grain based food is needed to feed animals, and the amount of food that is consumed by animal livestock is staggering. It is estimated that the grain required to feed the U.S. livestock population would be sufficient to feed the entire of the U.S. human population twice over^[46], while globally, the food consumed by livestock on a yearly basis could be used to feed a greater number of humans than the current global human population (8.7 billion people)^[47]. This effect is further confounded by the clearing of land to allow grazing of livestock animals. This process eliminates carbon sinks, and allows old, sequestered carbon to enter the atmosphere.

But rearing meat for produce is not alone in its woefully inefficient use of resources. Cultivation of crops by the usage of synthetic fertilisers releases exotic greenhouse gases, such as nitrous oxide. The requirement of artificial fertilisers to outrun the drawdown of soil quality has led to increasingly potent

* I have omitted discussion of nuclear technology options, such as the fusion project, ITER, or the nuclear waste powered molten salt reactor, but these technologies too offer enormous potential, particularly as a transition between fossil fuel and green energy.

nitrogen based fertilisers being developed, some of which require as much as 150% of their weight in crude oil to produce^[48].

Despite this calamitous inefficiency in our food, there are solutions to these issues that are currently in development, and that preclude the obviously difficult path of forcing the world's population to become vegan. One of the most promising (and unusual) is the production of meat, *in vitro*. This process involves the growing of a piece of meat in a lab, without the requirement to grow the entire animal from birth.

Aside from the ethical advantages that this type of meat may offer to vegetarians, research has shown that the potential efficiency and environmental benefits of this process are significantly better than using traditional livestock^[49]. It has been estimated that for every hectare that is used for the production of *in vitro* meat, anywhere between 10 and 20 hectares of land may be converted from conventional livestock based agriculture usage back into its natural state, allowing for the restoration of powerful carbon sinks^[50].

An Oxford study found that *in vitro* meat was "*potentially ... much more efficient and environmentally-friendly*", generating only an estimated 4% of greenhouse gas emissions, reducing the energy needs of meat generation by up to 45%, and requiring only 2% of the land currently dedicated to livestock^[51].

So why is this process of food production not being pursued? The commercial profitability for *in vitro* meat is simply not economical at this point in time. This is primarily due to the growth medium within which the meat is cultured, which currently has to be taken from an expensive and difficult to obtain animal serum. A cheaper, plant based growth medium is on the horizon, but until this is proven, large scale *in vitro* meat remains a fairly remote prospect^[52].

Under a system of currency that actually accounts for the tremendous damage that livestock farming causes within the environment, these costs would naturally seem more palatable, but under an individualist paradigm, this is not the case. Despite the billions of dollars of damage globally incurred due to climate change and hunger, the cost of *in vitro* meat to produce is still weighed against the marketability of traditional meat.

However bringing meat production away from the farm and into the lab is just one step that could potentially improve the efficiency of our food production. One fascinating concept is the vertical farm, the brainchild of Dickson Despommier. The vertical farm involves the stacking of food production floors

on top of one another in a skyscraper-like structure, and growing food hydroponically (without soil) reducing the footprint required in land area.

The vertical farm would act as an enclosed, climate controlled grow-house, in which crops can be produced all year round. Year-long farming multiplies the productivity of the farmed surface by a factor of 4 up to a potential maximum of 30 depending on the crop^[53].

Furthermore, enclosing crop production in an indoor space minimises the dependency of the crop on favourable weather conditions^[54]. This is a tremendous boon for the robustness of the food production system, as large scale floods in the United States have cost billions of dollars in lost crops and topsoil erosion. As climate change progresses, it is likely that this situation will worsen, as it is estimated that large developing nations like India may lose up to a third of their agricultural output due to changing weather patterns^[55].

In addition to the reduction of farmland used for livestock rearing, moving crops into stacked vertical farms further allows conversion of disused farmland back to its original state, potentially allowing reforestation and the redevelopment of beneficial carbon sinks^[56]. The relocation of farms within large centres of population would also act to reduce the fossil fuel requirement for transportation of food (currently estimated at around 10% of food related emissions)^[57].

The controlled growing environment of the vertical farm also essentially removes the need for pesticides, and allows usage of optimal genetically modified strains of food to be grown without fear of these cross pollinating with the surrounding natural environment. The growing system also reduces the volume of fossil fuel intensive fertiliser needed, by removing any risk of environmentally hazardous fertiliser run-off into the water table* (fertiliser is dissolved in the hydroponic solution, and can be filtered and reused as necessary).

However, we must not sing the praises of the vertical farm too strongly, as in comparison to the open air traditional farm, access to sunlight is an issue. The stacked structure of the farm reduces the sunlight that each plant may receive, due to the differing proximity to windows. Numerous solutions to this issue exist, such as elaborate rotating systems to give each plant window-time, but the fact of the matter remains that electrical energy will be required to power these systems, or to pump the facility with natural light.

* See [84] for the environmental effects of fertiliser run-off

Some of this energy could be clawed back by the farm structure itself, through solar and wind microgeneration installations. The farms could additionally utilise methane sequesters to generate some proportion of their electrical needs, transforming organic waste and by-products into biogas to fuel electricity generators^[58]. It is however unlikely that this combination would be enough to fulfil the energy budget requirements to power the lighting and/or rotation equipment.

In an economy where electrical energy is provided relatively abundantly and on a sustainable and zero-carbon basis, this energy demand does not pose an insurmountable issue, but it does necessitate the creation of additional energy capacity in order to meet the requirement of a net zero carbon footprint.

What is abundantly clear is that the technical possibilities of high tech agriculture and food production, unconstrained by narrow concepts of cost, offer a future that can feed the world's population cleanly. By implementing a system which allows these potentially valuable technologies to be exploited to their fullest extent, a sustainable and robust food production system is technologically feasible.

Housing

Energy usage and efficiency in most developed countries is dominated by the standard of buildings. A study by the U.S. Department of Energy in 2008 showed that the energy used to heat, cool and equip buildings approached 40% in 2006, with 21% being dedicated to powering homes and residential buildings. This is a comparable energy share to the amount devoted to the entire U.S. transportation system^[59].

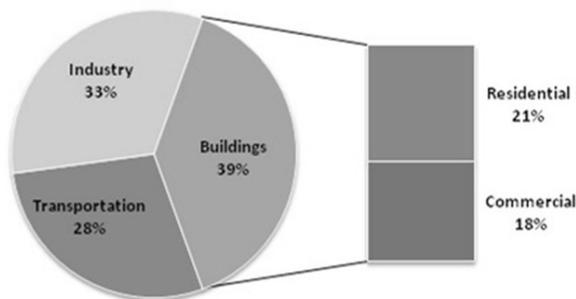


Figure 3.2-7: Usage of energy in the USA (2006) - Adapted by author from [60]

Yet wastage within residential buildings is of paramount concern. It has been estimated by the Energy Saving Trust in the UK that up to £1.3bn in energy is wasted in UK homes on a yearly basis^[61]. Intelligent design solutions to this energy inefficiency are in existence, but the piecemeal legislative approach to encouraging energy efficiency ultimately falls short based upon the whims of consumer choice.

For example, many free government schemes have been introduced to provide homeowners with free insulation, boiler improvements, double glazed windows and other related tax allowances for home heating, targeted at poorer individuals. This is all well and good, and has played its part in reducing household wastage, but the increasing energy demand of appliances in proportion to other expenditures has largely remained unchallenged. The U.S. Energy Information Administration has shown that between 1993 and 2009, appliance use has begun to catch up heating of homes as the primary energy expenditure (Figure 3.2-8).

US Home Energy Expenditure

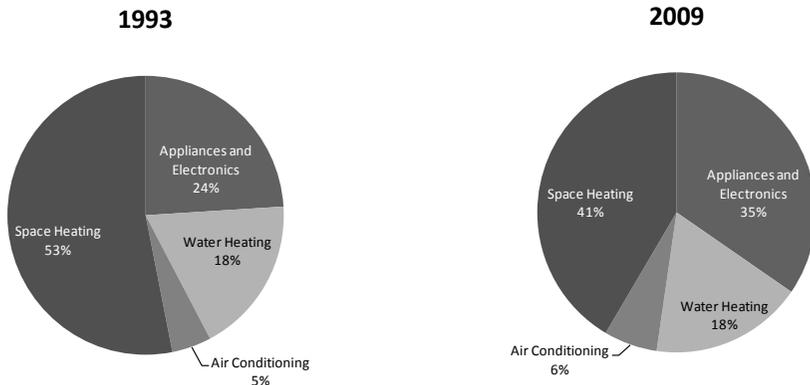


Figure 3.2-8: The rise of appliance energy expenditure (USA, 1993 - 2009) - Adapted by author from [62]

This presents a problem, as household appliances of all forms remain a popular mainstay of fetishised and consumer alluring purchases, with home cinema systems potentially running up energy bills in excess of £1,000 a year^[63]. In the kitchen, the fetishisation of generic functional appliances becomes more bizarre. The Swedish AGA oven has become a symbol of middle class rural luxury, yet the cast iron device is a voraciously wasteful consumer of gas, and is purpose built to never be turned off^[64].

This is a difficult topic to tackle, as people's homes are rightly their own. But under a value backed currency platform, this becomes a soluble issue, as currency can simply be created to match the value of a home which is performing efficiently. Families could quite literally be paid not to have AGAs.

Kent Larson of MIT's Changing Places think tank and design house has proposed many solutions to simple but bespoke residential living, which allows for standardised components, but deeply personalised features. The CityHome project by Hasier Larrea, Daniel Goodman, Oier Ariño and Phillip Ewing has demonstrated this by taking a very small 200sqft 'chassis' of a home and allowing potential residents to design their own layouts from generic components, based upon their hobbies, interests or living habits^[65].

By integrating plug and play elements into this chassis, the project allows for integrated efficiency between generic components, such as responsive lighting which actively assesses what area of the home that people are in. Furthermore, the usage of advanced moveable walls allows a much more flexible space within an otherwise very small apartment^[65].

The result is a dynamic living space which balances the high degree of personalisation that we expect from our homes, yet fulfilling the requirement for active energy efficiency. Further to this, the home can be fully redesigned for the next occupant by swapping the generic building blocks for others, and reconfiguring their positions within the home.

But energy efficiency extends beyond integrated appliance usage, and ultimately must tackle some of the shortcomings of heating and cooling spaces. Justin Hall-Tipping of NanoHoldings LLC has helped to develop a technology which potentially offers solutions to both heating and cooling of residential buildings. This solution is however not a power source, instead it is a re-think of the humble window.

In hot conditions, windows function as a greenhouse by allowing sunlight (a mixture of long wavelength infra red and visible light) into the room but not allowing heat (short wavelength infra red) out. As a result, warmer nations spend a significant amount of energy trying to cool the room, with bulky and energy hungry air conditioning systems. In cold conditions the opposite happens, as we try to heat up the interior of the room, but much of this is lost through windows.

NanoHoldings has produced a window system which can change its chemical state in order to selectively vet the heat and light falling on it. Thus it may let light in, but minimise the infra red heat that is permitted to cross the window (either inwards or outwards). This is impressive technology, but requires funding to create a commercially viable system^[66].

Efficiency of energy is no doubt important, but equally important are efficiencies of other resources. A study into water usage by the UK Energy Saving Trust showed that consistently, personal showers are the biggest water user in the household, comprising up to 25% of the total water usage. Interestingly the lavatory was the second most water intensive device in the house, with a similar 22% of the total^[67].

This water usage is a prime example of the disorganised and blinkered applications of resources within current households. Futurist Jacques Fresco has designed a simple integrated bathroom fixture, which combines the toilet, the sink and the shower in a water sharing system. The relatively clean waste water from the sink and shower is used to fill the toilet cistern, such that the toilet effectively consumes no additional water when it is flushed^[68]. This simple design feature saves the typical household 22% of its water use by integrating banal features together using engineering.

Samsung's Future House also proposes solutions to further societal problems by integrating systems together. The South Korean demonstrator house features active uplinks to the internet, which drive certain household functions. For instance, the refrigerator logs the best-before dates of each item stored, and gives occupants warning as to when these items are nearing expiry. The kitchen worktop can automatically connect to online databases and give suggestions as to healthy recipes that can be cooked using these ingredients. This integration of intelligent systems offers improvements to health, and reduction of food waste due to spoilage^[69].

The bathroom of the Future House is equipped with an automated health station, which the occupier may use to assess blood pressure, cholesterol and heart rate at the touch of a finger. Based upon the information provided, the system may suggest eating or exercise regimes to improve general health, or even contact a hospital if a certain indicator is approaching dangerous levels. In a society where healthcare is such a costly affair, this simple system offers significant value by allowing citizens to pre-empt illness^[69].

Additionally, the Future House operates with customisable, low power wall lighting, which can be used to change the appearance of the decor without resource heavy painting or wallpaper decoration. This allows new owners to personalise their home digitally, without the requirement for remodelling^[69].

But if this kind of intensive technology is not to an individual's liking, there are a breadth of options within the scope of sustainable, resource and energy efficient architecture. German architect Werner Sobek has created a much more minimalist and nature oriented home in Stuttgart, known as House R 128.

The house is a glass clad cube, constructed entirely from recyclable materials, which requires no internal heating due to its passive solar absorption. Seasonal temperature shifts are balanced by a seasonal thermal energy store, while electricity is generated by rooftop solar panels. In a similar manner to Samsung's Future House, every item in the house is computer-controlled to attain peak efficiency, but not quite in the same invasive manner^[70].

An even more unusual, but adorably beguiling home concept has been developed by American architect Mitch Joachim. Dubbed the "Fab Tree Hab", Joachim's design is a house that is constructed entirely from living tree material. A prefabricated Computer Numeric Controlled (CNC) reusable scaffolding is manufactured off-site in advance, then moved to the location to be woven with infant vegetation. As the vegetation grows around the scaffold, a living tree trunk wall gradually develops, following the contours of the shape^[71].

Once completed (after many years), the house is an enclosed wooden pod with a large thermal mass, heated by passive solar. Wastewater from the home is filtrated and absorbed by the tree structure. In addition to this, the living tree acts as a carbon sink to remove pollutants from the atmosphere^[71].

But housing structures alone are not sufficient to transition to a system of optimum resource and energy efficiency, we must also consider how groups of residential structures are combined and how they work together. This again is pertinent to the idea of microgeneration. By grouping dwellings together on a network of linked systems, such as local energy storage banks (batteries or otherwise), we can enable small scale wind and solar energy to be exploited effectively, and minimise the drain on the larger energy grid.

Furthermore, by linking groups of houses together in their water and wastewater usage systems, anaerobic digesters can be used to break down bathroom and

kitchen waste into biogas, which can be burned for cooking or heating. This also acts to reduce the incidence of methane emissions, a potent greenhouse gas. This vision for dwellings is tremendously costly under the paradigm of debt and austerity, but offers significant energy and resource savings.

An extrapolation of this design methodology for housing can be expanded to a fully functioning city model. Indeed, this approach has been used to produce a wide range of concepts showing new interpretations of how humans might live.

The Venus Project of Jacque Fresco has produced a variety of circular city designs, in which the population reside in circular bands around a central business area. Green energy is generated by a combination of wind, solar and geothermal, while clean electric transport is provided by orbital and radial monorails moving around the city^[72].

Other audacious, hyper efficient habitats have been proposed as offshore floating structures. The Floating ecopolis, otherwise known as the Lilypad, is a floating habitat concept designed by Belgian architect Vincent Callebaut, which incorporates closed cycle ecology in order to satisfy all four challenges laid down by the OECD in March 2008 (climate, biodiversity, water and health)^[73]

The ecopolis was originally proposed as a model for future climatic refugees, displaced by rising sea levels, but the proposal was extended as a long-term solution to general CO₂ emissions. The floating habitat has a capacity of 50,000 individuals in zero carbon, energy efficient dwellings, and is arranged around a central artificial lagoon that performs the task of collecting and purifying water^[74].

A similar, but much larger proposal is the Green Float by the Japanese Shimizu corporation. The Green Float consists of a central residential skyscraper, surrounded by a circular green area used for food production and carbon sequestration. Powered by ocean, wind and solar energy, Shimizu boasts a 100% sustainable energy budget, while using wastewater from the residential areas to drive aquaponic farms, resulting in a net zero waste system^[75].

Italian Architect Paolo Soleri referred to this holistic, systems approach to architecture as 'Arcology' (a portmanteau of architecture and ecology). Soleri was instrumental in developing the idea through his work at Arcosanti*, and his various city designs, (for example, his linear city Solare). Soleri's philosophy

* Soleri's Arcosanti is a small scale demonstrator project for a sustainable community

encapsulated the central criticism of this book, and beautifully summarised the market's attempt to crowbar efficiency into its fundamentally inefficient framework.

We put solar panels on a single family home but can't change the impact of inefficient construction or the consumption inherent to moving around the suburbs. We buy hybrid cars but must drive in the gridlocks of daily commutes. We buy "green washed" products but continue the same hyper consumption that sprawl mandates. These improvements produce a "better kind of wrongness."^[76]

So while these kinds of proposed habitats seem far-fetched, or outlandishly expensive, we must recognise that this feeling is tempered by our inherent biases within the concept of value. This is why the proposed arcologies which have reached planning stages (such as Crystal Island in Moscow^[77]) suffer such setbacks; they are untenable within the market incentive system.

Industrial Production

The final piece of the puzzle within a technologically developed societal model is the industrial sector. We may consider this to be the aspect of civilisation which is responsible for the manufacturing of products. Under a market paradigm, products are produced to be sold, as we have discussed in the first section of the book. How might this process look under a manner of discourse where real value is embodied within the economic system?

The consumption cycle has historically led to products following certain lifecycle trends. Typically, the product is created in the form that it is intended to fulfil for its entire life. Once the product is unable to fulfil its duties, it is disposed of. This rule may not necessarily hold for very complex or expensive items (such as buildings, aircraft or ships, which may be upgraded over their lifespan), but in general, most sundry or generic items follow this general mantra.

But outside of a consumption paradigm, it is patently obvious that this needn't be the case. What if a product could be produced with the foresight of its upgradeability already embodied within the design? This is partly the aim of Google's Project Ara.

Ara is the codename for an initiative that aims to develop an open source hardware platform for creating modular and upgradeable smartphones and tablets^[78]. The platform is in essence a structural chassis, upon which

technological modules of the owner's choice (displays, cameras, extra processors or batteries, etc.) can be mounted^[79]. This allows users to remove malfunctioning modules without disposing of the entire phone, and crucially allows upgraded components to be added to the phone as they are developed. This approach is intended to extend the lifespan of the handset and potentially reduce electronic waste, by allowing the phone as a whole to endure the obsolescence of individual parts^[80].

The open source hardware movement has however also extended into a broader trend; this is the concept of distributing and downscaling the means of production into the home. The Makerbot is one of the latest in a series of small DIY home 3D printers intended for this very purpose^[81].

The design process for these devices has been significantly simplified by the introduction of free CAD software, such as Google's Sketchup. Alternatively, rather than creating a design, users can download one of over 11,000 online, on a wide variety of sharing databases. Thingiverse.com is one of these online repositories, where users can share their digital designs. The site features an eclectic mix of everything from decorative ornaments, to functional replacement parts for various everyday items^[82].

As the flexibility of 3D printing continues to develop, this freeform design community offers a tremendous boon to the post market society. No longer would businesses be required to gauge the demand for a certain product, before designing, tooling, producing and bringing it to market. Instead, end users could essentially design their own product for free, or modify an existing, freely available product design, before sending the digital data to a 3D printer (whether in the home, or a larger facility elsewhere).

While this approach offers tangible benefits by circumventing the operational inefficiencies of the current industrial system, the effect upon consumption and conventional waged employment would be disastrous upon the market economy.

But the production of goods in an efficient manner is dependent upon efficient usage of materials. Under our constitution, the post market society is tethered to sustainability, as this is a fundamental requirement. Sustainability demands that recycling becomes the norm within an industrial system, as the drawdown of natural resources inevitably results in depletion when prolonged.

Fortunately, many of the required recycling solutions for material wastage are already in development. MBA Polymers, led by Michael Biddle have developed

a recycling process for mixed plastic waste which requires less than 20% of the energy needed to produce virgin from oil. Of the approximately 250 billion kgs (550 billion pounds) of plastic used annually worldwide, less than 10% of these plastics from mixed waste are currently recycled^[83].

In comparison, over 90% of the metals, such as steel, copper and aluminium, are recycled. This is due to the difficulty in sorting plastics, due to their similar densities, electrical properties and visual appearance. The MBA approach utilised a highly automated system which sorts plastics with high levels of accuracy, before melting the material into small pellets for re-use^[83].

With technologies like this in existence, there is no reason to continue wasting plastic in landfill, or drilling more crude oil to produce new material; the only stumbling block is economic hesitance. Closed cycle systems must take the place of the traditional model of market economics in order to produce a wholly reliable and sustainable system of industrial production.

Within a system of value backed currency, the closed loop approach to material usage becomes much more appealing, and the value of material much more salient. It is common today for a product to instantly become worthless after a single use, and be cast into a landfill (a plastic cup or spoon for instance). This is because the market economic system favours the production of a new spoon from virgin plastic, including the transportation, the drilling of oil, etc.

However under a currency system of real value, the extraction of new, virgin material from the earth is disincentivised against empirical sustainability parameters (for obvious reasons). The material of the waste product may therefore retain its value for reuse, and consequently have currency created to reflect this value. As such, while individuals may spend currency in order to gain ownership of a product, they may also be paid in currency for recycling the product at the end of its usage.

This follows on to an interesting upshot, as individuals may essentially be paid currency for returning waste material to the industrial system, thus providing a direct incentive to pick up litter. Again, all prices of raw materials may be determined based upon usage statistics, i.e. the volume of such a material in stock, and the rate of expenditure as it is integrated into new products.

This is a picture of an industrial model which is admittedly incomplete, but by thought experiment within a new currency system, it is indeed interesting how different the priorities become. By developing a technological society that is

integrated around such a currency model, the seemingly insoluble, cost-constrained issues of today become intuitively simple to remedy. I implore you to experiment further with this concept and produce your own ideas of how this economy may function. Next, we will discuss the social ramifications of such an economic model.

Chapter 3.2 - References and Notes

- [1]. *2013 Report Card for America's Infrastructure*, America Society of Civil Engineers - <http://www.infrastructurereportcard.org/executive-summary/>
- [2]. Peter Hartwell, R. Stanley Williams, *CeNSE: Central Nervous System for the Earth*, HP Information and Quantum Systems Lab, Spring 2010
- [3]. *The Smarter Supply Chain*, IBM Corporation, 2009
- [4]. *Annual Global Road Crash Statistics*, Association for Safe International Road Travel - <http://asirt.org/Initiatives/Informing-Road-Users/Road-Safety-Facts/Road-Crash-Statistics>
- [5]. *Ibid*
- [6]. Michael Manville, Donald Shoup, *Parking, People, and Cities*, Journal Of Urban Planning And Development, Vol.131, No. 4, December 1, 2005, pg234
- [7]. *Car Emissions and global warming*, Union of Concerned Scientists www.ucsusa.org/clean-vehicles/car-emissions-and-global-warming
- [8]. Phil Terrigno, *10 American Cities With the Worst Traffic*, Time, June 11, 2014
- [9]. Parmy Olson, Kelly Nolan, *Europe's Most Congested Cities*, Forbes, 4/21/2008
- [10]. Peter Newman, Jeffrey Kenworthy, *Sustainability and Cities: Overcoming Automobile Dependence*, Island Press, 1999
- [11]. *Ibid*, pg101
- [12]. *Kent Larson: Brilliant designs to fit more people in every city*, TED (video), originally filmed June 2012 at TEDxBoston 2012 - https://www.ted.com/talks/kent_larson_brilliant_designs_to_fit_more_people_in_every_city
- [13]. *Ibid*
- [14]. *Ibid*
- [15]. Maggie Hiu fu Wong, *Hong Kong's MTR: Taking a ride on the world's most envied metro system*, CNN, March 31, 2015
- [16]. Benoit Lefèvre, *Urban Transport Energy Consumption: Determinants and Strategies for its Reduction*, Sapiens 2.3, Vol.2 / n°3 - Cities and Climate Change, 2009
- [17]. *Ibid*
- [18]. C.F. Bonn, *Hiriko vert*, The Economist, Jan 27th 2012
- [19]. *Kent Larson: Brilliant designs to fit more people in every city*, TED (video), originally filmed June 2012 at TEDxBoston 2012 -

- https://www.ted.com/talks/kent_larson_brilliant_designs_to_fit_more_people_in_every_city
- [20]. *Baseline energy statement – energy consumption and carbon dioxide emissions on the railway*, ATOC, March 2007
- [21]. *Annual Passenger Total Approaches 3 Billion According to ICAO 2012 Air Transport Results*, International Civil Aviation Organization, COM 30/12, 18 December 2012
- [22]. *Growing Global Demand Causes Boeing to Boost Production of 737 Aircraft*, Industry Week, Oct 2, 2014
- [23]. Joyce E. Penner et al, *Aviation and the Global Atmosphere*, IPCC, 1999, pg9
- [24]. Stephanie Hegarty, *Could hypersonic flight become a reality?* BBC, 31 December 2011
- [25]. Iain Thomson, *European Space Agency clears SABRE orbital engines*, The Register, 29 Nov 2012 - http://www.theregister.co.uk/2012/11/29/esa_sabre_clearance/
- [26]. Kadhim Shubber, *Skylon: Alan Bond's mission to replace space rockets with spaceplanes*, Wired, 12 August 2013 - <http://www.wired.co.uk/news/archive/2013-08/12/skylon-alan-bond>
- [27]. Anne M. Stark, *Americans continue to use more renewable energy sources*, Lawrence Livermore National Laboratory, Jul. 18, 2013 - <https://www.llnl.gov/news/americans-continue-use-more-renewable-energy-sources>
- [28]. *Hard Facts: An Energy Primer*, Institute for Energy Research, 2012, pg.9
- [29]. *Cost of transporting coal to power plants rose almost 50% in decade*, U.S. Energy Information Administration, November 19, 2012 - <http://www.eia.gov/todayinenergy/detail.cfm?id=8830>
- [30]. Tim Ross, *Wind farms paid £30m to shut down during high winds*, The Telegraph, 23 Feb 2014
- [31]. Paul Denholm, Erik Ela, Brendan Kirby, Michael Milligan, *The Role of Energy Storage with Renewable Electricity Generation*, National Renewable Energy Laboratory, Technical Report NREL/TP - 6A2 - 47187 January 2010, pg.8
- [32]. Stuart Nathan, *Grid-connected energy storage: a new piece in the UK energy puzzle*, The Engineer, 8 November 2012 - <http://www.theengineer.co.uk/in-depth/the-big-story/grid-connected-energy-storage-a-new-piece-in-the-uk-energy-puzzle/1014536.article>

- [33]. Jake Richardson , *First Hybrid-Flywheel Energy Storage Plant Announced For Europe*, Clean Technica, April 7th, 2015 - <http://cleantechnica.com/2015/04/07/first-hybrid-fly-wheel-energy-storage-plant-announced-europe/>
- [34]. Tom Lombardo, *UltraBattery a Boon to Renewable Energy, Grid Storage, and EVs*, Engineering, March 09, 2014
- [35]. Denmark: http://www.windpower.org/da/aktuelt/aktuelt_i_vindmoelleindustrien/news_q1_2014/2013_var_rekordaar_for_vindenergi_i_danmark.html
Portugal: <http://www.centrodeinformacao.ren.pt/EN/Informacao/Exploracao/Pages/EstatisticaMensual.aspx>
Spain: http://www.ree.es/ingles/sistema_electrico/pdf/infosis/Avance_REE_2011_ingles.pdf - January 2012.
Ireland: <http://www.eirgrid.com/renewables/>
UK: <http://www.renewableuk.com/en/news/renewableuk-news.cfm/electricity-needs-of-more-than-a-quarter-of-uk-homes-powered-by-wind-in-2014>
Germany: <http://www.bmwi.de/Dateien/BMWi/PDF/energie/wende-in-deutschland.property=pdf>
- [36]. Grace C. Visconti, *Nano Vent-Skin: Solar, wind and nanotechnology combine to deliver a new green alternative*, The Examiner, January 4, 2011 - <http://www.examiner.com/article/nano-vent-skin-solar-wind-and-nanotechnology-combine-to-deliver-a-new-green-alternative>
- [37]. *Solar may become largest global power source by 2050*, Houston Chronicle, September 30, 2014
- [38]. Daniel G. Nocera, *The Artificial Leaf*, Acc. Chem. Res., 2012, 45 (5), pp 767–776, April 4, 2012
- [39]. Ricardo Guerrero-Lemus, José Manuel Martínez-Duart, *Renewable Energies and CO₂: Cost Analysis, Environmental Impacts and Technological Trends*, Springer-Verlag London, 2013, pg. 228
- [40]. Ben W. Ebenback, Daniel M. Martinez, *The Path to More Sustainable Energy Systems: How Do We Get There from Here?* Momentum Press, 2013, Section 3.5.2
- [41]. Gérard C. Nihous, *An Order-of-Magnitude Estimate of Ocean Thermal Energy Conversion Resources*, Journal of Energy Resources Technology, Vol. 127, pp.328-333, December 2005

- [42]. Ladislaus Rybach, *Geothermal Sustainability*, Geo-Heat Centre Quarterly Bulletin (Klamath Falls, Oregon: Oregon Institute of Technology) 28 (3): 2–7, September 2007
- [43]. H.N. Pollack, S. J. Hurter, and J. R. Johnson, *Heat Flow from the Earth's Interior: Analysis of the Global Data Set*, Rev. Geophys. 30 (3): 267–280, 1993
- [44]. H. Steinfeld et al, *Livestock 's long shadow: Environmental issues and options*, Food and Agriculture Organization, Rome, 2006, pg. xxi
- [45]. Marcia Kreith, *Water Inputs In California Food Production*, Water Education Foundation, September 27 1991, pg.30
- [46]. *U.S. could feed 800 million people with grain that livestock eat, Cornell ecologist advises animal scientists*, Cornell Chronicle, Cornell University, Aug. 7, 1997 - <http://www.news.cornell.edu/stories/1997/08/us-could-feed-800-million-people-grain-livestock-eat>
- [47]. Mark Gold, Jonathon Porritt, *The global benefits of eating less meat*, Compassion in World Farming Trust, Navodanya, 2004
- [48]. Kelly Rai Chi, James MacGregor, Richard King, *Fair Miles: Recharting the food miles map*, International Institute for Environment and Development, Dec 2009
- [49]. Hanna L. Tuomisto, M. Joost Teixeira de Mattos, *Environmental Impacts of Cultured Meat Production*, Environ. Sci. Technol., 2011, 45 (14), pp 6117–6123
- [50]. Dickson D. Despommier, *A Farm on Every Floor*, The New York Times, Aug. 23, 2009 - <http://www.nytimes.com/2009/08/24/opinion/24Despommier.html>
- [51]. *Lab-grown meat would 'cut emissions and save energy'*, University of Oxford, 21 Jun 2011 - <http://www.ox.ac.uk/news/2011-06-21-lab-grown-meat-would-cut-emissions-and-save-energy>
- [52]. Karen Wright, Susan Kruglinski, *I'll Have My Burger Petri-Dish Bred, With Extra Omega-3*, Discover Magazine, September 22, 2008
- [53]. Dickson Despommier, *Vertical Farm Essay I*, 2008
- [54]. *Ibid*
- [55]. Michael Pollan, *Big Food vs. Big Insurance*, The New York Times, 9 Sept 2009
- [56]. *Carbon Sequestration through Reforestation: A Local Solution With Global Implications*, U.S. Environmental Protection Agency, Office

- of Superfund Remediation and Technology Innovation (OSRTI), March 2012
- [57]. Tara Garnett, *Wise Moves: Exploring the relationship between food, transport and CO₂*, Transport 2000 Trust November, 2003
- [58]. H. Scott Matthews, *Case Study — Landfill Power Generation*, Green Design Initiative, Carnegie Mellon University, 2000
- [59]. *2008 Buildings Energy Data Book*, U.S. Department of Energy, 2008, Section 1.1.1
- [60]. *Ibid*
- [61]. *Energy Saving Trust: households waste £1.3bn for leaving gadget switched on*, The Telegraph, 26 Jun 2012
- [62]. *Residential Energy Consumption Survey (RECS): Heating and cooling no longer majority of U.S. home energy use*, U.S. Energy Information Administration - <http://www.eia.gov/consumption/residential/>
- [63]. Richard Stevenson, *Point of View: The high cost of home cinema*, Home Cinema Choice, January 2012 - <http://www.homecinemachoice.com/news/article/point-of-view-the-high-cost-of-home-cinema/9887>
- [64]. George Monbiot, *This is indeed a class war, and the campaign against the Aga starts here*, The Guardian, 13 January 2009
- [65]. *Places of Living and Work, Changing Places* - <http://cp.media.mit.edu/places-of-living-and-work>
- [66]. NanoHoldings - <http://www.nanoholdings.com/portfolio-items/nradianance-nanosystems/?portfolioID=117>
- [67]. *At Home With Water*, UK Energy Saving Trust, July 2013
- [68]. *Future by Design*, a William Gazecki Film, 2006
- [69]. David Nield, *Samsung CEO outlines his vision of our smart home future*, Digital Trends, September 5, 2014
- [70]. Information taken from - <http://www.wernersobek.de/en/projects/material/glass/r128/>
- [71]. Mitchell Joachim, Javier Arbona, Lara Greden, *Nature's Home*, <http://www.archinode.com/Arch9fab.html>
- [72]. Jacques Fresco, *The Best That Money Can't Buy: Beyond Politics, Poverty & War*, Global Cyber-Visions, 2002
- [73]. Matthew Knight, *The floating ecopolis*, CNN, July 11, 2008
- [74]. *Ibid*
- [75]. *The Environmental Island - Green Float*, Shimizu Corporation - <http://www.shimz.co.jp/english/theme/dream/greenfloat.html>

- [76]. Paolo Soleri, *Arcology: The City in the Image of Man*, Cosanti Press, 2006
- [77]. Mark Knowles, *Russia's Financial Woes Mean Cancelling Norman Fosters Projects*, Russia Today, December 15, 2008
- [78]. Eric Brown, *Google's Project Ara Open Source Smartphone to Debut in Puerto Rico This Year*, Linux.com, 29 January 2015 - <https://www.linux.com/news/embedded-mobile/mobile-linuX/806348-googles-project-ara-open-source-smartphone-to-debut-in-puerto-rico-this-year->
- [79]. *Ibid*
- [80]. *Ibid*
- [81]. See; <http://www.makerbot.com/>
- [82]. See; <http://www.thingiverse.com>
- [83]. Information taken from - <http://www.mbapolymers.com/home/our-company>
- [84]. David Biello, *Fertilizer Runoff Overwhelms Streams and Rivers-- Creating Vast "Dead Zones"*, Scientific American, March 14, 2008 <http://www.scientificamerican.com/article/fertilizer-runoff-overwhelms-streams/>

3.3 Societal Development

THE CONFIGURATION OF INFRASTRUCTURE and industry under a post market model of currency may offer some insight into a post market world, but little can be gleaned as to what actual day to day life under such a system would be like. Modern society remains dominated by the concept of market competition, and almost every social institution in existence aligns itself with these ideals. Schools create workers rather than thinkers; jobs demand billable hours rather than results; city centres are awash with the delights of the shopaholic, and so forth.

What would society therefore look like in an economy which was not based upon conventional market competition? What would people do? How would society arrange itself? These are understandably very difficult questions to answer, but none the less, we will attempt to draw up a view of what this society might resemble. Within this, we may then speculate to some degree regarding the values and lifestyles that people within the society might choose to adopt.

The Working World

While we have covered a broad hypothetical process as to how an action may be enacted within a value backed economic system, we have not yet perused how this may look realistically in terms of the human institutions that would be involved. Who would work for who? What would be done to prevent fraud? How do we ensure that the tenets of the constitution are upheld?

Using an online, meta-currency system as briefly described in chapter 3.1, we may very easily hard code many of these processes within the system, but an institutional structure still must exist in some form. The following is therefore a description of how a working society might look if based upon a scientific, value backed economy.

All businesses inevitably begin with an idea of some form, and within a value backed economy, these ideas come from the same place as a market economy - the minds of the general public. Within the online currency platform, open

source collaboration will allow potential entrepreneurs to discuss, develop and refine plans for various ventures, whether they are incremental improvements to existing products, revolutionary new processes, or anything in between. By allowing free exchange of data, and free access to bespoke design and testing tools (purpose built laboratories may be available to the public under supervision for such activities), the open source community could present a high turnover of potential ideas.*

But of course, we must recognise that not all ideas are created equal. As such, within the open source planning platform, a critique hurdle must be passed. This critique could be as simple as a rating system, where members of the public review the proposal, and bestow a rating out of 5, along with a brief summary of the strong and weak points. The beauty of the value backed currency system is that members of the public could be paid in currency to give such ratings (allowing automated algorithms to ensure that ratings were genuine, and written critiques were relevant).

For proposals that fall below a predefined cut off (3 out of 5 for example), the critiques as to why the proposal failed would allow the entrepreneurs to refine their idea, improve their weak points and return with a better proposal. Proposals that meet the open community critique and score a rating above the cut-off are permitted to progress to the formal vetting stage of the process.

The scientific assessment represents the primary review of the contents of the proposal, and as such is carried out by a dedicated, educated[†], professional community, who are paid in currency to carry out their tasks. Upon submission of the proposal to the scientific community, the proposal would be distributed to more than one relevantly skilled independent review team, ensuring that any conflicts of personal and professional interests are eliminated. Each review team would independently and blindly assess the claims and points of the proposal, comparing these claims to the available data on current economic performance, both on a wide and local scale if need be.

Upon completion of the review, each team would either sign off the proposal, accepting that it offers potential, and remains within the constraints of relevant

* *It is interesting to note that such an open source design community does actually exist in its infant form. The website rndiy.com has successfully developed numerous creations amongst its user base, including an easily produced hydroponic window grower.*

† *Later in the chapter, we will discuss education more fully - for now, it can be assumed that the educated scientific community is not a closed, elitist group of privileged individuals, for reasons that will be revealed later.*

clauses of the constitution, or they would reject the proposal for failing to demonstrate such. In the event that a pre-defined majority of the review teams allocated to the task arrive at the same conclusion (unanimous agreement, or 2 out of 3, etc.) the project would move to the next level. In the event of a rejection, the review would become available to the open source community, and the process could start again from the beginning, incorporating the scientific requirements.

The next stage may not be required for all projects, but is included for completeness. After scientific agreement, the proposal is passed over for any required democratic consultation with the affected general populace. For many developments, such as the creation of a new product or service, this consultation would not be required, as it does not directly affect anyone. However, for the construction of large infrastructure near people's homes, the retirement of products or services upon which individuals may depend, or the new development of critical, explicitly public services (such as healthcare), consultation with the public is needed.

In these instances, aspects of the proposal which are non-scientific, or not integral to the functionality of the proposed idea may be discussed directly with those who might use it, or those who might be affected by its production. For example, as with modern architectural developments, planning permission must be agreed with locals for any structure above a designated size. In most existing nations, such permission is based upon archaic and obscure mediums which frequently go unnoticed by all but the most determined citizens. By using an accessible, online system similar to that proposed later in this chapter, a much wider democratic decision may be arrived at, which agrees best with the needs of all involved.

Clearing the democratic process, the proposal enters operation, and is perused for currency backing by a designated team of economists. The economists will assess the proposal and create currency to represent the projected value of the project. This currency pool will be set up with a series of performance contingencies, for example, the meeting of certain design milestones, demonstration of technical progress, etc. The members of the open source community who proposed the project will then progress their tasks using the currency provided to them digitally online via the currency platform.

As the project matures, it will be vetted and assessed on a periodic rolling basis, by both the scientific community and the economists, in order to ensure

adequate progress is being made. A flowchart of this process is shown in Figure 3.3-1 in order to illustrate the progression of a project.

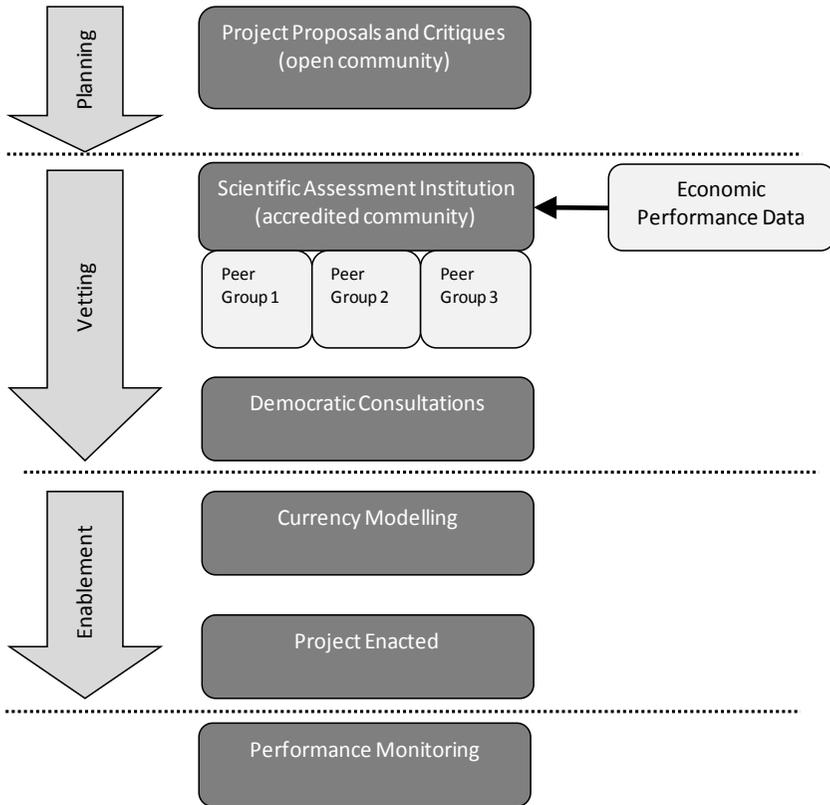


Figure 3.3-1: General flow chart of project development

To many inculcated within the current system of economics, this process may seem highly bureaucratic, however the basic model for this progression is identical to what is found within the research and development departments of almost all highly agile and successful businesses. The proposal is developed by employees (open source community), it is proposed to the technical board (scientific community), market research is performed with the general public (democratic consultation) and the budget for the development is agreed by the board of directors (currency modelling).

Furthermore, the process of starting a business within a conventional capitalist market is far more bureaucratic, as one must secure funding in a currency scarce

environment. The reality of this manifests in the form of various stock offerings, repeated proposal reviews with potential venture investors, and so forth.

The Axiom of Work

So within this complex system of interlinking institutions, what does the actual layperson's day to day life look like? Do they go to work, and if they do, what does such a workplace look like? From the perspective of a market economy, it is difficult to fathom a society which is devoid of a rigorous and regimented workplace, but under a value backed currency system, workplaces which do not create actual value would not exist (or rather would have no reason to exist).

Within a society as outlined, work in exchange for currency would indeed still exist, as work would need to be done in order to maintain, develop and produce various items within the economy. The difference lies in the libertarian nature by which citizens may choose to work. In the absence of a consumption cycle, and with adequate economic safety nets in place (see the subsection on Access Rights), the impetus to work will lie with the worker. As we have seen in chapter 2.3, the incentive to be creative, to be challenged and to develop oneself is a far more effective method of motivation than one of raw financial gain.

None the less, we have also seen that financial incentives are a decent tool for encouraging less interesting, perhaps slightly mechanistic work. As such, currency in exchange for work is something which is likely to remain a necessity. A hybrid approach to incentivisation is therefore likely to be the most pragmatic approach.

By removing the harsh survival prerogatives surrounding work, we open the floor to the creative and incentive driven freeform work that we have discussed in chapter 2.3. At the same time, by rewarding good work with currency that may be spent on luxury, we ensure that communities of workers remain in good spirits through dull or repetitive tasks, and offer them something to show for their efforts.

This general process may be exemplified by a scenario; let us suppose that the open source community has proposed a project to improve a local building that has fallen into disrepair. A group of citizens appoint themselves as stakeholders, and draft plans as to what they want to develop. The group submits this to the scientific community, who promptly confirm that the project is simple, abides by the relevant sustainability criteria, and sufficient material is available to start immediately.

As the building exists near the homes of some community members, the proposal is deemed to require additional democratic consultation by online survey. The locals respond warmly to the proposal, and place a handful of caveats on their agreement relating to the size and appearance of the development. The economic team review the plan and create a pool of 10,000 credits of currency for the proposal, subject to monthly reviews to ensure the currency is being used correctly.

The group are now in control of the project, and are permitted to pay themselves currency from the fund provided. They need several specialists to commence work, including an architect to flesh out the preliminary ideas, a structural engineer to assess the integrity of the building, and a CAD operator to create virtual models of the design. The team, for sake of argument, offer 1,000 credits for completion of each of these tasks by a relevantly skilled individual - the opening is advertised within the open source community,

In the event that each of these roles are easily filled, and the work completed to a satisfactory standard, the monthly review with the economists will proceed swimmingly and the project may continue. However let's say that in this case, the team is beset with difficulty. The structural engineer has been paid, but his or her assessments of the structure have turned out to be dangerously incorrect. The CAD operator has also been paid, but does not appear to have the requisite skills up to a suitable standard, and the work provided has been shoddy. The architect on the other hand appears to be a conman, who has taken the payments and then cut off all contact.

By using an integrated currency system with a traceable and transparent transaction history, the currency spent in this case can automatically be recouped from the guilty party. In this manner, an appeal and dispute system built into the currency platform can be directly linked to any transaction of currency. Disputes may be opened and assessed by independent third parties (who of course can also be paid in currency for the disputes they successfully solve). Interestingly enough, such systems are already commonplace within almost all online marketplaces, yet within the wider market, individuals and banks must arbitrate in legal courts in order to recoup such losses.

So a method for the distribution of work is indeed feasible under such a system of currency, but how do we calculate labour demand within this economy? It is all well and good in our example, as we paid all three skilled workers the same wage, but are these skills really equal? If they are not, how can we determine the relative value of each?

It is worth mentioning at this point that the modern market cannot calculate the actual raw value of these skills either, and can only offer a cursory assessment of how much return on investment the skill might offer. As such, high profit but ultimately trivial endeavours (such as financial services) frequently command the highest salary value.

Within a value backed currency system, the balance of labour supply and demand can directly be perused through raw data, rather than crude market measures. By integrating data from the education system (as explained in a coming subsection), we may determine an astonishingly accurate breakdown of who has what skills, where they are based and how long they have had them. Furthermore, through integration of historical transaction data, we can even rank these individuals in each skillset, based on experience, performance, satisfaction with delivery, etc.

On the other side of the coin, by assessing the requirements which are put forth through project proposals, and the skilled labour that these projects seek, a very accurate picture can be developed of the demand required for certain skills.

Under a market economy, very little can be done to rectify skill shortages in a reasonable term. Businesses may opt to offer much more attractive salaries to individuals with rare skills, but they are intrinsically limited by the profitability of their venture. As such, the demand for a skill is very much a second fiddle to the capacity for the wider project to produce consumption. Within a value backed economy, a robust, well matched demand and supply balance can be viewed as a valuable circumstance in its own right, and therefore currency can be created to represent this value.

Returning to our example, suppose that architects and CAD designers are in chronic shortage across the geographical area, while structural engineers are overrepresented. In this regard, the project may choose to pay the in-demand workers a larger amount, but they remain constrained by the value based budget that has been allocated by the economic community. As such, they offer a slightly larger amount, but not a sufficient enough amount that would prompt a host of individuals to leap from their chairs and train as architects.

However, with an integrated education and qualification system within the currency platform, a solution becomes readily apparent - create currency to pay individuals who study and become qualified in certain fields, placing caveats upon those payments in order to prevent fraud. Using the architect example as above, the registered number of individuals with relevant qualifications in

architecture can be assessed against the general levels of demand for architects within the open source community.

If there is a discrepancy between the two (to a certain factor of safety), individuals could earn currency proportional to the supply-demand discrepancy by completing courses and obtaining qualifications related to architecture. In the longer term, as the demand levels come closer to supply parity, this incentive could be removed. The beauty of this approach is that it may be almost entirely automated, in the same way that a simple control system operates. This would ensure active management and incentivisation of the supply of skilled individuals into the workforce.

So with this image in our mind, we can approximately visualise the workplace of a post-market economy. Work would likely become more sporadic, and more varied, with skilled individuals moving independently between numerous projects rather than being employed within a company.

At the same time, the provision of free, accessible and flexible education would allow a much more rapid transition of individuals between different roles in society, rather than the diploma that a person obtained in their early twenties dictating the career they will hold until their sixties.

By necessity, many of the jobs which require more constancy, and demand more professionalism (doctors, police officers, etc.) would likely remain largely unchanged from today, but would rightly command much higher prestige and remuneration due to their obvious criticality. Such roles would be managed by separate institutional bodies, which would interact with the economy in a similar manner. This kind of work will be discussed in the next subsection.

Institutional Employment

Many jobs will require a regimented and regulated workplace. The roles of teachers, nurses, police and other emergency services are such roles which require a higher degree of constancy, and a unified, controlled code of practise. Even within the previous subsection, the functions of the scientist and the economist within the proposal process require close regulation, and a consistent profile of staffing. How do we tackle these kinds of jobs within a value backed economy?

Before we tackle this answer, what is notable here is that these are the kinds of jobs within a modern market economy that are typically handled by the state, which lends itself well to the uniformity required by such institutions. The state

as an employer is however ingrained with many cultural problems relating to the wider market economy, many of which create a great deal of issues when attempting to deliver such services.

The most glaringly obvious of these is the state's constant battle to cut costs in the face of looming national debts. This is increasingly a political issue in the UK, where the government remains insistent on reducing the structural deficit through public austerity. This of course is a wholly artificial issue, as within a value backed economy, the value of the service generates the currency to fund that service, rather than through convoluted taxation and micromanagement of paltry budgets. If there are insufficient police to keep a region safe and secure, then currency must be created to pay more police, as it is the security of the region that is the value.

This costism within states often leads to a second phenomenon which erodes the quality of service; a cynical, competitive target based outlook. Constrained by tight budgets, publically funded services are expected to perform against market inspired competitive parameters, even if these parameters are entirely in contradiction to the actual value the service is purported to offer. In the USA, police officers are required to stop and search a predetermined amount of civilians every day, and individual departments are set against each other in order to compete for the target^[1]. In the UK, the individual offices within the welfare system compete based upon how many claimants they can deny welfare payments to^[2].

This direct contradiction within state delivered services is further compounded by the darker side of democracy, leading to an unscientific approach to services due to political ideology. As we will discuss later in this chapter, prisons remain woefully inept at rehabilitating offenders in most Western nations, due to the widely accepted view that they must be harshly punished and made to suffer for their crime. This view, and many others are hardened by political fervour and granted legitimacy by the ideological left and right. As such, governments aligning with these ideals push public institutions to mirror the ideological values of the party in power, emboldened by the supposed democratic decree of the public.

It is clear that under a value backed economy, we must do better than this. As such, institutions for these kinds of work may be created which are open plan, and actively managed democratically by the people on the front line, rather than ideologue politicians. Each separate institution (one for policing, one for nursing, one for fire services, etc) may be assembled from a loose collection of

autonomous local and regional institutions which are delegated their own affairs. The goal of these institutions is to provide the service that the public requires, and broad targets based upon these self evident, inarguable aims will be drafted and met at any currency related expense.

Two key factors here are important to underline - firstly, the democratic autonomy of such sub-institutions is a vital requisite for success and high performance. By distributing important decision making to skilled individuals who are closest to the issue, not only do institutions gain the ability to apply their frontline experience to the task at hand, employees within the institution gain a vested sense of pride in the work that they do. This is clear from the work of Mihaly Csikszentmihalyi covered in chapter 2.3.

Furthermore, even within the modern market economy, examples of autonomous, democratically run institutions are well trodden. Take for instance Avalon School, a charter middle and high school in Minnesota, USA. Avalon differs from other schools in the region in that a majority of decisions relating to the curriculum, classroom schedules, and even teacher salaries are made jointly by the full staff of 28 teachers^[3].

Avalon rigorously assesses its own performance through a system of committees in which teachers evaluate one another on a clear, tangible basis. Parents and students also evaluate teachers, and if issues are apparent, a range of restorative measures are implemented. The result is a very freeform, yet encouragingly high performance school, where conventional class structures are largely dismissed in favour of open-ended projects. Around these projects, teachers keep in contact with students to ensure that overall curriculum requirements are met^[3].

This model of semi-autonomous institutions, running on a worker centred democratic template, is a wonderfully robust and versatile approach to these kinds of employment, but it is wholly dependent upon the liquidity of the institution in question. Under market forces, there is not any consumptive drive behind such forms of service, therefore political driven micromanagement, bureaucracy, and convoluted, competitive target setting becomes the norm in an effort to reduce overheads. The result is inevitably a suffering service, which invariably defeats the object of these services in the first place.

Through value backed currency however, such issues are not a problem, as the valuable asset is the desired result (i.e. properly educated children, a safe population, quick and effective healthcare, etc). Currency liquidity to deliver this

service will by definition therefore exist, so long as the valuable result remains valuable.

The second point to cover is the onus that must be placed upon these institutions to provide the valuable services to society. We touched on this in the previous paragraphs, but in order to fully render institutions accountable to the population, we must design in failsafe systems related directly to the performance of these services. As such, each institution may be actively monitored by a whole range of data sources. For policing, this may be an independent, automated crime reporting system, which is filled out by victims and empirically logs the occurrence of crimes. For hospitals, we may install a similar feature relating to the efficacy of treatment, or the general satisfaction with the level of care received.

These may then be combined with other measures (such as general public opinion) to generate a full performance metric for the institution, which may be distributed locally, nationally, etc. Against this, a factor of safety may be applied, as with other critical life support systems. If a performance metric begins to fall below a predefined level, then automatic systems may be activated which cut off currency paid to influential employees of these functions, if the deficit is sustained long enough or falls far enough away from the desired performance.

This offers a significant degree of power to the population, in that the transparency of institutions, and their accountability to the public remain central to their efforts. This is also a particularly important measure when dealing with institutions which are granted powers over the population, such as the police.

It is also worth mentioning that the scientific and economic assessment institutions would also be subject to similar systems. In this regard, the institutions may be required to turnover proposals at an acceptable rate, and would be scrutinised for the quality of their reviewing. This further cements the decentralisation of decision making, as neither the scientific or economic institutions may develop dictatorial properties, despite their centrality to economic process.

Again, an example may be used to illustrate this. Let us say that a fire department is struggling to cope with its demand in a region. During a general meeting, one of the frontline firefighters suggests that, because unreeling a certain piece of equipment is a 3 person job, an extra person in each crew would drastically reduce deployment time. The group vote that this is a good idea, and

submit the proposal to the economic community, who promptly create funds for the department to hire 20 new firefighters. As these new roles are created, the number of wanted firefighters in the area rises, automatically creating bonus currency payments for anyone who trains to be a firefighter. This attracts the required number of applicants and the performance discrepancy is rectified.

In the event that the proposed solution did not improve performance, and instead the speed of deployment worsened, the firefighting department may cross the threshold into unacceptable performance. At this moment, chairpersons from the democratically run board of firefighters would automatically be notified that if performance did not improve to above the acceptable standard within six months, their currency would be cut off and they would be automatically de-registered as board members.

During this time, the firefighters may make several new proposals to the economic community, such as new equipment, a renovation of their premises, improvements to on-the-job training, all of which may be granted currency to implement. If at the end of the six month period, performance was still not above the acceptable target, then the assumption would be that the chairs of the democratically run department had mismanaged the situation, as they were afforded sufficient liquidity to develop a solution to the problem. At this point, the department would automatically dissolve leadership and new leaders would be elected by their peers.

So, a mental image of a value backed system of nested institutions is becoming salient. However, the elephant in the room must be discussed. Currency remains central to these kinds of repetitive roles, and while pragmatic automation may be proposed and applied to the fullest extent without fear of unemployment related woes, differences in salary between workers seems unavoidable. The important question therefore arises - by partially using currency based incentives to drive people's behaviour, and by offering larger sums of currency to certain professions, how do we ensure that intractable social classes do not emerge? This will be the topic of the following subsection.

Designing Equality - Currency Mechanics

As we have seen in chapter 1.8, economic equality is an important factor in the overall health of a society, and therefore must be central to any successful economy we propose. Returning to our example of the in-demand architect, we can see that such a profession is not something that anybody can do. People naturally vary in their levels of intelligence, interests and skills. Architecture is a

challenging and creatively demanding topic that not everybody will be well suited for.

How then do we avoid the scenario of the relatively small, highly skilled portion of society that are able to be architects becoming absurdly wealthy and inspiring ire in their fellow citizens? With the usage of automation exploited to its fullest potential, how do we prevent the difficulties of manually skilled individuals losing their earning potential and languishing at the bottom of society?

The solution to this is relatively simple, and will be designed into the functionality of the economic system via three key characteristics. These are; a zero compound interest currency system, a universal basic income and a progressive wealth cap. These will be explained as follows.

We should already be familiar with the phenomenon of compound interest. As discussed in chapter 1.4, this property of our current society is one which is entirely based in the inflationary properties of debt backed monetary markets.

When an individual acquires an amount of money, they may invest the money into an endeavour, in the hope that it will see a return. In its most ubiquitous form, this comprises paying money into a savings account, which may then be bolstered by the bank through a mixture of loan extension and financial market speculation. The banks may hold an individual's money as a base, and use this to loan a much larger sum of money into existence* for their customers, thus generating profit and siphoning off a share for account holder interest.

The result of this is that having money, in itself, generates money, which of course contributes to a fundamental divergence between rich and poor. In a value backed economic system, currency is created based upon projected value, rather than debt backed speculation. As such, the action of hoarding currency within this system accomplishes nothing, as this behaviour holds no value to society.

At the same time, the requirement for compound interest upon currency would be negated by the systemic properties of the economy itself. Within a market economy, individuals must go into debt in order to acquire money, because money is fundamentally scarce. This is because money can only be created through debt financing. As such, even the most valuable endeavours find themselves floundering for investment because of risk and illiquidity, whilst

* *The process is of course much more complicated, and is explained more fully in chapter 1.4*

meaningless, high turnover endeavours (such as speculation) attract tremendous interest. In a value backed economy, currency is not scarce, and can be obtained simply by justifying the potential value in an empirical manner.

As such, if an individual did intend to use their stockpiled currency to extend loans at interest, even by unscrupulous means, it would be a difficult model to sustain given the wide availability of currency through work and education.

A similar fact is true of investments. Within a market economy, an investor may pay money into a certain endeavour such that the recipient is indebted to the investor in some way. They may own part of the company and be entitled to a share of the profits, or they may demand their investment back within a timescale, plus a return. Again, in a value backed economy, this holds no traction. Projects are invested in based upon their scientific acumen and their ability to meet the requirements embodied in the constitution.

By designing a currency system devoid of compound interest, one sidesteps the debt based collective irrationalities that such a financial property creates. Furthermore, one circumvents a powerful means by which the wealthiest in our society become exponentially more wealthy. This is however not a total solution to the issue, as the poorest in society must also be considered when designing the currency system.

In 1924, British engineer C.H. Douglas proposed his social credit system, in which he proposed a National Dividend which would be paid to each citizen in order to balance the difference between public purchasing power and the price of goods. What Douglas proposed would be reshaped over the years into the concept of the Universal Basic Income (UBI), in which every citizen within a nation would be paid a guaranteed, no-strings-attached basic salary, simply for existing^[4].

In general, resistance to this system of income within the market economy comes from two broad taboos; perception of a reduced incentive to work, and a perception of inaffordability. Within a value backed currency system, such concerns are not entirely relevant. From our analysis in chapter 2.3, we have seen that incentive in relation to financial gain is not as powerful a tool as is commonly believed, and more importantly, people are at their most creative and productive when they are financially comfortable, rather than fighting a Darwinian battle of survival.

In addition to the work in chapter 2.3, specific studies into basic incomes (Canada by Evelyn Forget in 2011^[5], Madhya Pradesh, India in 2010^[6] and Ojivero-Omitara, Namibia in 2008^[7]) have typically found that the effect of UBI is positive for general societal health, with little noticeable reduction in will to work. Only the USA has found evidence to suggest the contrary^[8].

By providing a living standard UBI to the population in a value backed economy, the fundamental issue of unemployment becomes soluble. A pragmatic, open source, value backed economy is highly likely to yield much less work for its population, through a combination of intelligent automation, and the obsolescence of repetitive, meaningless or consumption driven work. As such, the UBI not only acts as a fall back when labour is not in demand, it also represents a net to prevent an unrecoverable descent into poverty for those who are not gifted, skilled or intelligent.

Furthermore, the UBI represents a sound concept when perused from a philosophical economic standpoint. Each individual in a society is capable of creating some degree of value, it is therefore proper that this value is correctly modelled within the economy.

The third and final prong within an economically egalitarian currency system is perhaps one that might be viewed as controversial, but this in reality speaks only for the absurdity of our current set of values within the market economy. Within the capitalist marketplace, it may seem strange to think that there is no upper limit to how much wealth a person can accrue. Indeed, a Credit Suisse report in 2014 projected that within the next 60 years, the planet could possess as many as 11 trillionaires^[9]. Such an amount of money would likely eclipse the net GDP of most of the world's developing nations combined, and it would all be within the estate of a single person.

This kind of hoarded wealth is not conducive of a truly functional economy, and as such, a true value backed economy must recognise this. Therefore, within the online currency platform, some feedback mechanism must exist which restricts the maximum amount of wealth-over-time that a single individual can accrue. The manner proposed here would be a progressive cap, rather than a hard ceiling. An individual would therefore be able to earn currency, but the more they earned, the more difficult it would become.

Let's look at an example. Suppose a very skilled, very hard working individual has earned a large sum of currency within their online account. As the individual earns more, he or she passes a soft threshold, which is automatically defined

based upon the economic conditions at that point in time. Once the currency in the account passes the soft threshold, a fractional multiplier will automatically be levied against the currency, which will progressively shrink the further the individual gets beyond the soft threshold.

For example, the soft threshold may be considered to be 1,000,000 credits in the individual's account. For the first 1,000 credits above this threshold, a multiplier of 0.75 applies. The individual earns another 1,000 credits, but this is reduced to 750 credits (the additional 250 credits is destroyed).

The balance is now 1,000,750 credits, and the individual earns a further 1000 credits, which pushes the balance over the next boundary (2,000 credits above the soft threshold of 1,000,000). This amount would therefore be subject to a 0.50 multiplier, meaning that the individual receives 1000 credits \times 0.5 = 500 credits.

The progression may carry on upwards, with each payment that pushes the balance further beyond the soft threshold yielding diminishing returns. For example, if the individual's balance stands at 1,004,000, they might only receive 10% of any payment into their account, with the remaining currency being destroyed on receipt. A hypothetical progression is illustrated in Figure 3.3-2.

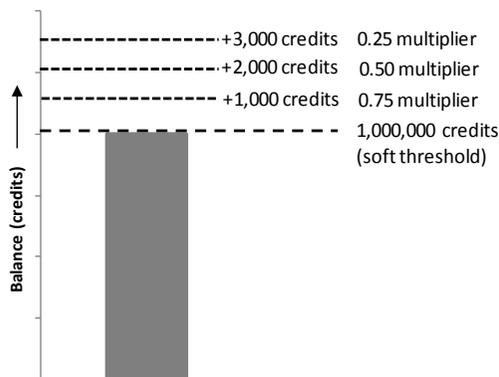


Figure 3.3-2: Maximum currency threshold example

So how, from a philosophical standpoint, can we justify the destruction of currency that an individual has earned? The concept of destroying money is not something which conventional neoclassical economics typically discusses, yet there is ample justification for such an action if we fully understand the nature of collective irrationality.

When an individual earns money in a market system, the money is theoretically a measure of value. As an already rich individual becomes even more wealthy, the assumption remains the same - that the individual is contributing more value to the economy. Yet as we have seen in chapters 1.8 on inequality, and 1.7 on political investment, increasing the wealth of the rich can lead to many profound social problems. These phenomena must be modelled within any currency system that claims to accurately represent value.

As such, when an individual becomes wealthy beyond the prescribed limit within a value backed economy, the currency that is destroyed, represents the value that is lost through the resulting decline in social cohesion. Simply put, it offers no further value to society for that individual to become any more wealthy, therefore currency cannot be accrued.

Furthermore, while this approach may seem anathema to hard libertarians, it is actually a more meritocratic approach than the current, compound interest based market. Look at it this way; within the modern marketplace, it becomes easier to make money, the more money you already have. This is the exact opposite of a meritocracy, as individuals face a diminishing challenge as they ascend the hierarchy. In the proposed system, the opposite is true, and individuals who attain significant wealth must challenge themselves significantly more in order to build further wealth. This additionally acts to increase social benefit, as it encourages the supposed 'best' amongst us to work more to attain their level of wealth, rather than retiring to a mansion and living off investments.

Designing Equality - Access Rights

It would however be foolish to suggest that a realistic economic equality can be obtained entirely based upon currency mechanics. Within a diverse society, the access to quality food, healthcare, housing, transportation and entertainment all play integral parts in defining an individual's economic standing, and in many cases these phenomena are not entirely correlated with direct economic wealth.

For example, countryside dwellers may enjoy the benefits of scenery, space and relaxation to a greater extent than the city dweller. Conversely, the city dweller would likely enjoy a much wider selection of services, a better quality education, as well as a significantly higher purchasing power. Within a market economy, these disparities are swept under the blanket of individual preference, notwithstanding the fact that careers, property prices and geographical locations frequently preclude any alternative.

Under a value backed economy, these issues may be directly addressed and managed to a much greater extent. As a tenet of the constitution which we drafted in chapter 2.1, every human is entitled to a basic standard of living, including all services required to meet this. Again, this prescription is not wide eyed romanticism, but rather a pragmatic follow on from psychological and epidemiological data. By providing for the basic needs of every member of society, the functionality of society as a whole improves.

We may therefore ascribe value to the provision of basic needs to the population, as we can heuristically argue that improving the health of society is a valuable end result. Against this value, we may create currency with which to carry out the needed tasks to provide such basic needs. In the hierarchy of value in chapter 3.1, we may prioritise these needs based upon their criticality to the human condition (air, then water, then food, and so on).

The result of this is that each citizen of the value backed economy may be entitled to water, food, a home, healthcare, transport, energy and law enforcement completely free of charge, simply by right of the constitution. The economic reasoning behind this is that these properties of society are valuable, and therefore currency must be created to represent this value. No money would be required to change hands from the population, to providers of these services, as the currency to pay service providers is intrinsically created against the provision of the service, and is maintained based upon the continuing robustness of that service's performance.

As in interesting aside, within a market economy, the relationship between these kinds of services are highly skewed. Private companies shoulder the risk of offering services to the public (such as food or water), while public consumption of these services pay for the costs associated with running them. On the other hand, state institutions provide healthcare, law and order, in the hope that by providing these services to a healthy and safe public, economic growth may be permitted to occur. Thus taxes may be levied against the public's share of this economic growth in order to pay for the services the state offers.

In a value backed economy, charging individuals for services which are intrinsically valuable to all is not necessary. Instead, individuals are granted access to necessary services in the understanding that the maintenance of a healthy, prosperous and safe population has immeasurable value in terms of the returns in productivity, reduced crime etc.

There are however several caveats that must be applied to this. Of course, within any population, individuals will seek to push their luck to some degree. As such, reasonable limits must be applied to provisions in order to deter unsociable behaviours. For example, this might mean that a citizen would only be permitted free access to a certain amount of food, or energy over a given timeframe, with anything beyond this requiring currency to purchase (such currency would be destroyed on transaction, as the economic ramification would be that the individual is consuming at a rate that is too high). This would prevent hoarding, wasteful or overtly hedonistic behaviour, whilst also encouraging sustainable consumption of supplied products.

A similar case can be made for housing, with each citizen being entitled to a dwelling that meets their requisite needs. For example, a family of 5 would be permitted access to anything up to a 5 bedroom house, while single individuals may be given access to suitable apartments.

But what of luxuries? While the basic needs of the population are covered by the provision of essential services, we have not discussed what individuals can do to indulge, relax or entertain themselves. Through the provision of the basic income, and the currency that individuals may earn through work and other means, we can fully anticipate the desire to purchase luxury or hobbyist goods - such endeavours can be catered to by a pseudo-market.

With earned currency, individuals may purchase access to larger or better located housing, specialist hobby equipment, concerts, professionally cooked foods, etc. But how do we manage such a pseudo-market while still ensuring that the products and services it generates are in adherence to the constitution? To answer this question, we may again return to the hierarchy of value described in chapter 3.1.

As entertainment, aesthetics and miscellanea (encompassing luxury items) are ranked high in the pyramid, we may rightly prioritise the more life critical systems below it. As such, the decision process is simple - prioritise resources and energy to safeguard the performance of all lower order systems. Once these systems perform to an adequate standard, and to an acceptable factor of safety, excess resources may become available for purchase within the pseudo-marketplace.

This offers a fascinating chance to demonstrate where a marketplace is actually well suited to distributing value. In contrast to the empirical life support systems of the lower hierarchical levels, luxuries, entertainment and hobbyism revolve

around subjective and perceived value. As such, a system where purchasing is driven by market value rather than objective merit is actually a useful tool. Best of all, such a market system would be echelons higher in its efficiency and liquidity, due to the fact that the currency pulsing through it is constantly being renewed, and is indicative of actual real world value.

We can readily ensure that life supporting systems that rank lower in the hierarchy are given priority by controlling resource flows into the pseudo-market. As we have illustrated in our examples in chapter 3.1, materials, energy and labour are allocated based upon performance parameters. If a hobbyist sports car manufacturer requires 1 tonne of steel to manufacture a vehicle, the currency system will only grant the material if more critical systems do not require it first.

Labour may follow a similar system, whereby job advertisements would only be made visible to the public if safety critical systems do not require individuals with similar skillsets. Like material allocation, all of this process may be automated, while data is crowd reviewed by the economic and scientific communities. A coarse flowchart of the process is shown in Figure 3.3-3.

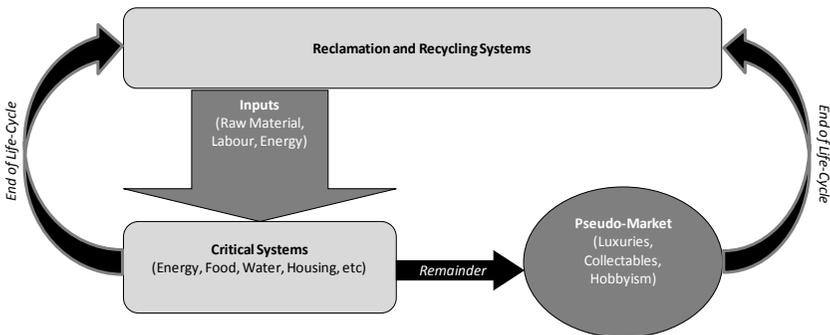


Figure 3.3-3: Flow chart of raw inputs for safety critical systems in relation to the pseudo - market

But what is equally important here is that the basic income provided by the currency platform removes any barriers for entry in the pseudo-market, ensuring that all have access to some degree of luxury services as their right as a citizen. As we have seen in the parable of the failed consumer in chapter 1.3, the access to entertainment, to art, to luxury and to eclectic hobbies is fundamental to the prosperity of the individual, and to wider society as a whole.

Under such a system, stratification would of course occur, and some would rise to the top - it would be unrealistic to suggest otherwise. However, the provision of universal rights of citizenship - housing, food, income, energy, healthcare - and a functional limit on the accumulation of wealth over time would mean that such disparities could be rendered comfortably narrow. Additionally, society would be safe in the knowledge that those who were lucky enough to rise to, and maintain their place at the top, were genuinely merited in their efforts, and ultimately deserved the position. It is under such a system that a pragmatic and realistic social equality could be made possible.

Law and Order

Of course, within any society individuals will do wrong for a plethora of reasons. Our study in section two of the book has shown fairly conclusively that adverse economic circumstances exacerbate anti-social, destructive and violent behaviours, but it is foolhardy to suggest that economic reform could consign criminality to the history books outright.

As such, re-imagining society as a functional mechanism, we must view a criminal justice system as a failsafe device to protect the population from harm. This is indeed the titular purpose of the traditional justice system, yet its actual current functionality is worlds away from this ideal. So often we see prison used as an ideological totem within Western society. Mantras abound surrounding how tough prison sentences deter potential criminals from offending, and severely punish those who may think twice about it in the future.

These parables generally align with our sense of justice; those who have done wrong must pay their penance and atone for their crimes. Such beliefs are so tightly held within the population that we lose sight of what the purpose of prison actually is - it is not a centre for karmic rebalancing, but instead it is supposed to be an institution which protects law abiding citizens from the dangerous, violent or coercive. Yet it is abundantly clear when perusing the data that prison in its current form is a woeful tool for accomplishing this goal.

Figure 3.3-4 shows a 15 state study carried out in the USA between 1983 and 1994 on the likelihood of recidivism within 3 years of prison release. It found that for both years, around 60% of those released from prison would go on to reoffend within 3 years. Of this, around 52% would end up back in prison, either for a fresh conviction or for invalidating their parole^[10].

US Recidivism Rates

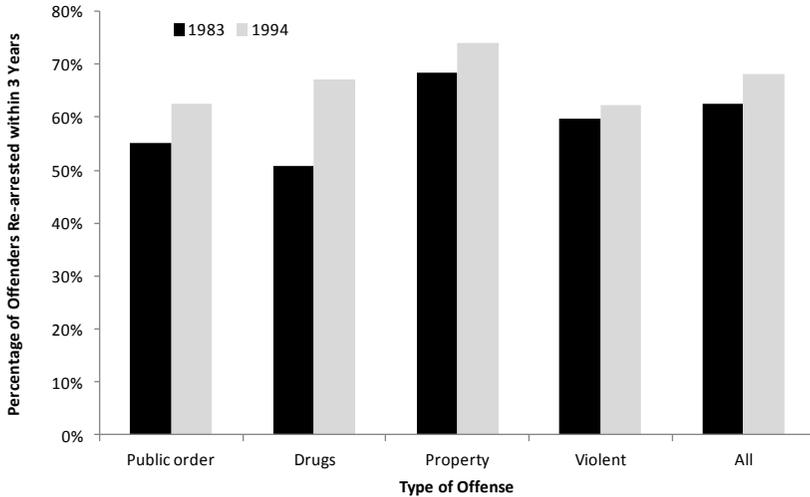


Figure 3.3-4: USA Recidivism rates - Adapted by author from [10]

These are disastrous numbers for any system which purports to keep the public safe. In the UK, the picture is not significantly better, with 59% of prisoners who are sentenced to 1 year in prison, returning to prison within 12 months of release^[11].

Within prison, the environment is also life threateningly toxic, as a 2010 report from the Prisons and Probation ombudsman found. The average age of male prisoners who had died from natural causes was 56 (versus 78 years for the wider population) and 47 for female prisoners (versus 81), generally considered to be a result of their sedentary lifestyle, poor food and health provision^[12]. These factors are in addition to the logistical realities of missed hospital appointments (due to a lack of escort staff), and the difficulties surrounding access to prison doctors^[13].

Surprisingly, this toxicity within prisons also affects law abiding employees who work there. Insurance data has shown that in the USA, a prison officer's life expectancy stands at only 59 years, compared with 77 for the U.S. population. The suicide rate among prison guards is also a staggering 39 percent higher than the average for other occupations, as an Archives of Suicide Research study found^[14]. The harrowing sights that guards witness within prison, as well as the constant threat of attack from the most violent offenders leads to deep seated

stress, that frequently results in alcoholism, depression and even domestic violence^[14].

So, given conventional prison's grossly ineffective track record in reducing crime, and the tremendous damage it causes to every human who comes in contact with it, why do societies persist with their usage of such a woeful system. There are many answers to this, and especially within the USA, the profitability of private prison is a powerful factor, but ultimately it seems that the human sense of justice - to punish the wrongdoer - is so entrenched within society that we cling to its superficialities without question.

Political candidates who run their elections on tough, no nonsense punishments for criminals simply command more authority than those who might seek an unorthodox or empathic approach, and so may sculpt justice policy more readily. In the USA, Sheriff Joe Arpaio of Arizona has successfully been elected into his position six times, in an unbroken tenure that stretches back to 1992. His resume? The self styled 'toughest sheriff in America', an uncompromising stance on crime, and the creation of a sprawling prison camp known as 'Tent City'. It is clear that despite numerous controversies and his ultimate failure to reduce crime, a tough stance remains a popular determinant within democratic process^[15].

However the beauty of the scientific approach to society is that placation of the populace with tough stances and half truths is not required - we may design a system which actually works. So what do we know about justice systems that do what they claim?

Amazingly, true rehabilitative prisons which foster very low recidivism rates have existed and are well documented. HM Prison Grendon, near Grendon Underwood in Buckinghamshire UK, was opened in 1962 as an experimental psychiatric prison providing treatment for prisoners with violent, anti-social personality disorders. The prison was styled as a "therapeutic community" in which the inmates take on a semi-autonomous, self-policing role and elect their own representatives^[16].

Grendon has achieved where other prisons could not, by successfully rehabilitating the most violent and uncontrollable serial killers and rapists. At its peak, Grendon had the lowest reconviction rates in the country compared to any similarly sized prison, despite its specialisation in anti-social disorders and violent crime^[16].

Despite what would often be viewed as a soft touch by the public in its respectful treatment of prisoners, Grendon inmates find their rehabilitative process deeply challenging, and some take as long as six years before completion to an adequate standard. A former inmate 'Pat' spoke of his experiences in the prison;

“Coming here was hard. I'd never spoken to anyone about my feelings, my life, my troubles. I kept it all deep inside, my childhood, the abuse and so on. Can you imagine having to tell all these bastards here what was going on inside you?”^[17]

Unfortunately, Grendon costs more per prisoner than other prisons for similar offenders across the UK prisons system. As such, HM Grendon is gradually moving away from its past, and transitioning towards a normal, 'cost-effective' prison. Governmental cuts have already resulted in alterations to some of the admissions criteria and reductions in therapy sessions, with further cuts likely to come into force this parliament^[18].

HM Grendon however is just one success story within the otherwise dismal landscape of British prisons. An even more austere and infamous UK prison is the ignominious HM Parkhurst, whose halls have enclosed some of the highest profile violent criminals of all time, such as the Yorkshire Ripper, the Kray twins and the Moors murderers. Parkhurst is home to the absolute apex of violent offenders, and had therefore developed a reputation as a hotbed of violence.

Psychiatrist Bob Johnson was introduced in 1991 as the resident practitioner on C-wing. During his tenure there, Johnson battled to reform the most violent criminals through counselling. He was however repeatedly beaten back, both by the reticence of the prisoners and by claims as to the futility of his efforts by the prison management. Gradually, as Johnson gained the trust of the prison inmates, changes in behaviour began to manifest. Inmates opened up and discussed their difficult, and often violent childhoods. Doses of sedatives reduced, violence on the wing fell, prisoners were declassified from category A, and moved to less high security facilities. The counselling had been a success^[19].

However, Johnson's results were not capitalised upon, and the political gravity of a tough prison stance meant that Johnson's unpopular, empathic approaches were largely ignored. Johnson explains;

“They think they are deterring people, but deterrence makes the assumption that people are behaving rationally. And they’re not. These people may be offenders, but they are also victims, victims all the way through. They are desperate. Children are not born evil. You hit them and reject them and terrify them and make sure they know that the world is a terrifying place. You train them to be anti-social. They have zero social skills. They ask for what they don’t want. They don’t ask for what they do want. If they think you like them, they hit you.

I’m an emotional plumber. I tell these men I’m teaching them about their emotions and where they come from and what is going on inside their head. I’m showing them that reality is bearable, that it’s not lethal after all. The most significantly difficult thing to understand in life is other people but what’s most fascinating about people is that they are repairable. These people have been battered and abused all through their childhood and then the prison system comes along and carries on battering and abusing them. I want to stop punishing them and help them.’^[20]

Remarkably, on a global basis, prisons which treat inmates with dignity, while espousing strong, positive values, consistently outperform tough, authoritarian prisons in just about every metric. In Norway, Bastoy Island, an unremarkable 1 square mile of land just off the southern coast, houses one of the more unusual of such prisons. Bastoy Prison is an island colony in which violent offenders live and work relatively normal lives, albeit under the watchful eyes of extensively trained guards^[21].

Prisoners at Bastoy work day jobs in various parts of the island; growing food, washing the laundry, repairing bicycles and so forth. They live not in cells, but in shared dormitories that resemble holiday cottages more than prison wings. Despite the arguably luxurious surroundings, Bastoy is a centre of nearly unparalleled rehabilitative performance, with a consistent 16% recidivism rate for its former inmates, over 3 times more effective than the average UK prison^[21].

Bastoy governor Arne Nilsen however rejects the idea that the prison is ‘soft’ on criminals, or is not effectively extracting penance from its inmates. He writes:

“For the victim, the offender is in prison. That is justice. I’m not stupid. I’m a realist. Here I give prisoners respect; this way we teach them to respect others. But we are watching them all the time. It is important

that when they are released they are less likely to commit more crimes. That is justice for society."^[22]

By utilising a currency system which actively models value, currency may be created to pay for the valuable rehabilitative services that Grendon, Parkhurst or Bastoy are able to provide. By dismissing dogma surrounding notions of justice, we can cast aside the faux 'tough' stance on crime, and stop creating prisons which breed violence, ill-health and malcontent. Instead, criminals may actually be challenged psychologically while incarcerated, and individual, bespoke psychiatric plans drafted for their release. If they remain too dangerous to release, then their imprisonment may be continued until they are fit.

Scientific and pragmatic management of systems within an economy is therefore possible even within the most ideologically tainted of disciplines. But we must not be so naive as to think that scientific rigour can be applied everywhere. For the big, critical systems, an empirical approach is utterly mandatory, but there are simply too many superfluities within a society which matter greatly to the population, but lie in the realm of opinion or belief. What colour should the lampposts be? Should the local park be renovated? Is the proposed local building too big, too ugly, or too close to my home? For these kinds of questions, answers can only be provided by an exceedingly dirty word; government - this will be our next topic of discussion.

Governance

In the eyes of the public, government is perhaps the most fallen of the social institutions, in that its current form is so distantly removed from the initial intentions behind its formation. Fundamentally, the function of a typical democratic style government is to give the population a theatre in which to discuss and enact change. This underlying discussion is what lends many of our famous institutions their names, such as parliament, rooted in the French verb, *parler* (to speak).

Despite this, even the most modern governments are lumbering, archaic leviathans, which function approximately in the same manner as when they were first introduced centuries ago. Populations will vote on representatives who will then supposedly argue on their behalf, but are in no way obliged to. As we have seen in chapter 1.7, the elected individuals who make important decisions within parliament houses are all too easily led astray by vested and well financed interests.

It is however worth noting that government is not a monolith, and in many cases individuals within the chamber have delivered upgrades and positive changes to the process. But within a system that is so ancient and riddled with corruption, such changes are easily repulsed or rendered impotent.

Take for instance the Alternative Vote (AV) referendum which swept across the UK in 2011. This proposed system was devised in order to eliminate the need for tactical voting, thus ending the Labour / Conservative duopoly of the House of Commons, and improving the spread of parties in the chamber. The modification was simple - voters would rank the parties in order of preference, and the winner would be aggregated based upon the overall totals.

The major parties of the UK however successfully convinced the public that this would be a bad idea, using a barrage of effective buzzwords and catchy phrases. The knowledge that such a change would affect their domination of the commons did not sit well, and therefore had to be combated. Thus, the policy was defeated, and the traditional, yet dubiously inequitable First-Past-the-Post voting system remained in place.

Needless to say, in a world with near instantaneous communication across the globe, consulting with the public just once every 2 to 4 years is laughable, especially when even modest reforms to the general process (such as AV) are once in a lifetime events. Technologies have long been in place which allow the massive collaboration of people towards a common end, and such processes can be designed to nearly eliminate the corruption that so plagues government.

Indeed, many of these kinds of projects already have their seeds sown, and are already functioning to some degree in parallel with the lurching machinations of government. Beth Simone Noveck served as United States deputy chief technology officer for open government and led the Obama administration's Open Government Initiative. In her book, Noveck has discussed at great length the requirement of governments to develop platforms which combine the rigour of institutional hierarchies with the democratic energy of networks. As part of the Open Government Initiative, Noveck championed the usage of wikis to write common laws and policy, in manners that have already seen success in nations like Lithuania and Iceland^[23].

In the private sector, Jennifer Pahlka founded the Code for America nonprofit, which specialises in the creation of civic apps to supplement, and ultimately supersede complex government bureaucracies. Some of the creations from this company utilise viral properties and game-like dynamics in order to encourage

citizens to participate in local endeavours, such as the adopt a hydrant app, where citizens may choose to name a fire hydrant so long as they commit to maintain it. A similar app based upon this has been expanded to adopt emergency tsunami sirens to ensure that they remain functional at all times^[24].

Citizens Connect is a further creation which functions similarly to a simple question and answer forum. Peers and government officials may view and answer questions, sharing important items as FAQs to be stored for later users^[25].

Coding activist Clay Shirky has however underlined how these kinds of endeavours are just the tip of the iceberg in terms of open source government. With expertise in the open source programming community, Shirky has written extensively about the power of distributed version control in online development environments like GitHub^[26].

Within GitHub, programmers may incrementally improve open source code and merge their changes in a controlled manner, due to a complex system of change management. This means that gigantically complex and interdependent programs, such as the linux kernel, can be updated by a disorganised and distributed field of developers without a central system of authority.

Fascinatingly, on the fringes of GitHub, it is possible to find the beginnings of attempts to draft policy and laws through open source collaboration. There is no precedence for government to adopt such peer compiled laws, but the demonstrative power of the open source community is gradually coming into its own, and its salience is difficult to ignore.

So what would a democratic system within a value backed economy look like, and perhaps more importantly, what would it be used for? As we have seen, the decision process for developments must be governed by a peer review style system within the scientific community. This is the crux of the value backed economy, as the democratic process holds no guarantee of delivering the correct solution, only the most popular one.

As such, in the manner described previously, the focus of the democratic system is to deal with much more nuanced and subjective issues. These issues may be those that affect community, individual's home life and the aesthetics of the surrounding environment. An obvious example is what we today call planning permission.

Scientifically, we may empirically conclude that a new vertical farm is needed to boost food production in a certain area, but democratically, this opens a whole host of separate issues. Who's home is the structure to be built next door to? How tall can the structure be without being an eyesore to the community? What noise or lighting restrictions are reasonable? In order to answer these questions, a community-based democratic platform must exist, which for shorthand we may call the citizens' link.

The citizens' link platform could work automatically within the wider currency system, acting as a secondary gate review to proposals which have passed the scientific review, but are deemed to impact community life in a manner that must be assessed. The system would therefore have its own mechanism by which individuals could discuss, collaborate and review the various goings-on in their local area. The system may integrate into a newsfeed-like interface, in which local issues are presented based upon the user's place of residence.

Individuals located near a proposed site for development would be automatically and anonymously contacted via their currency account. This would grant them access to a new set of sub pages, in which the proposal could be reviewed in detail. Using a wiki or Git like format, locals could anonymously discuss the proposal, offer their agreement and/or draft a response. With the response in place, a set number of rounds may be defined, within which the locals must come to a conclusion (this prevents a small group of stubborn locals vetoing a necessary system installation).

As mentioned previously, the benefit of a value backed currency system is that individuals could be paid a small amount for their responses, encouraging a wider degree of participation in citizenship. Aside from inviting in a greater amount of voices, this approach would go some way to mitigate negative individuals being more vocal in their disagreement, while those in favour remained silent.

The overall outcome of this is that a document of agreement for the proposal may be produced entirely by the individuals affected. The scientific community assess the feasibility of a proposal, the democratic populace are given the opportunity to apply their own caveats to the proposal, and finally the economic community produce suitable amounts of currency to meet the prescribed aims.

This is a positive democratic system, and its functionality may extend far beyond the concept of planning permission and other such activities. Within the citizens' link sub system, a separate open source community may be invited to

participate. This one would be solely responsible for creating community legislation, which may then be passed across to law enforcement officials. For instance, a local crime hotspot may prompt locals to draft a legislation that requires regular policing of that area. This legislation may be proposed to the locals, reviewed, changed and eventually passed across to the police as a formal instruction.

The police may require more officers to carry out this public order, therefore may submit their own proposal to the economic community in order to meet their new public performance requirements. The result would be a creation of currency allowing the police to train and employ new officers and placate public demands, thus reducing crime rates, raising public opinion and therefore improving overall performance data.

This adds significant gravity to citizen autonomy, as the ability to offer formal instructions to public services underlines the sense of accountability that keeps such institutions in check. In a market economy, such a process is impossible, as public services are unrealistically constrained by cost. While similar, so-called petition systems do exist in most market democracies, their power is merely token, as the government typically holds little direct accountability, and ignoring such a petition is therefore easy.

So what is to stop the public delivering inane or absurd demands to their public servants? In order to filter out the crazy or the tongue-in-cheek proposals from within the democratic community, the same process will be applied as for the development open source community. Before being submitted to the scientific community, open source proposals must first earn a rating above a certain threshold. The same can be made true for democratic proposals, in that they must earn a rating before being proposed to locals for collaborative assessment.

This however may not entirely be enough to prevent the occasional bizarre demand from the public. After all, the petition to reinstate disgraced BBC presenter Jeremy Clarkson has attracted more signatures on change.org (over 1 million) than a petition to include the Green Party in parliamentary debate. It is clear that the wisdom of crowds is not always on the money.

Education

So with such tremendous autonomy and power to enact small-scale legislation vested within the population, how do we minimise the likelihood of democratic absurdity? The answer lies in one of the remaining institutions which we have not fully considered; the educational institution.

We have briefly touched upon education already within our discussion of general institution structures, but education deserves a more fuller treatment due to its tremendous centrality to prosperous human living. Within a modern technological society, the importance of education cannot be understated. Education is how the knowledge of generations is passed on, and built upon, and greater levels of education are positively correlated with just about every socially desirable trait imaginable.

Despite this, a majority of education systems within developed nations have strayed from this ideal, and instead simply inculcate children into the prescribed requirements of the day. This may be passing a barrage of tests and exams in order to satisfy governmental league tables, national and international, or moulding children into a trudging weekly routine to prepare them for 5 decades of trivial employment.

In 2009, a Cambridge University review scathingly criticised the British education system for this very reason, stating that a narrow breadth and target based culture within schools was stifling and mentally impoverishing children^[27]. However the UK government stood by its system, and continues with it to this day - the reason being that such a system which focuses upon narrow slivers of core subjects (maths, science, literacy, etc.) is effective at performing in league tables^[28].

The current dogma that surrounds education is admittedly understandable within a competitive, market based system of economics. Children are progressively conditioned into the society that surrounds them. They are taught to attend school at rigorous and inflexible hours of the day, in order to prepare them for the regimented workplace of adulthood. They are continually judged based upon the most empirical and objective metrics of performance in order to emulate the competitive, profit based world of market competition.

While the Cambridge study demonstrates that these are ineffectual approaches for creating a population of fully rounded, creative and prosperous individuals, the wider goal of the market system is largely attained. Modern Western schools instead opt to produce a narrow, work oriented population which will participate in the wider marketplace and hence raise tax revenue, a far cry from the noble ideals of education.

Sir Ken Robinson has written about this trend extensively in his book *Creative Schools*. Robinson furthers his argument by noting that standardised testing businesses typically garner huge profits from contracts with schools, and thus

wield significant sway in governmental decision making. The result of this is an overly testing intensive environment within an outmoded, industrial educational system^[29].

So what would a true system of education which actually aimed to impart knowledge look like? In order to answer this question, we must initially come to an understanding of why we educate individuals in the first place. By educating each successive generation, the belief is that those educated may build upon the knowledge and creativity of that which has gone before. In doing so, value is created, as new ideas, inventions and understandings may be devised, refined and put to use.

Without education, each generation would be required to re-discover all previous discoveries in order to build new ones, and hence any development of ideas would be left to chance. In such a society, stagnation, repetition and primitivism would be the extent of reality, and technology, philosophy and science would be foreign concepts. As such, we must recognise in this case that education is a valuable service within society, and to model this fundamental value, currency must be created.

It is worth noting at this point that the current market system represents this flow of value in the exact opposite direction, as typically individuals must pay in order to be educated. Whether it is through taxation, private education or tuition fees, access to education requires money, and access to the best education requires significant sums of money. This is a function of the debt backed paradigm of waged labour, but is also an expression of the inherent un-meritocratic stratification within a market system.

For example, a poor child growing up in a deprived area may possess tremendous potential, that may one day be applied to solve the hardest questions of our time (a cure for cancer, the unifying physical law, etc). Yet this child's gifts may be squandered within an underfunded school. All the while, a child of a wealthy individual may attend the best schools money can buy, despite distinctly average intelligence and limited creativity.

On no uncertain terms, this misapplication of the educational process harms us all, as it is us who are deprived of the life changing knowledge that remains locked in the minds of squandered children. Furthermore, it is fundamentally anti-meritocratic, as access to quality education becomes an accident of birth, rather than something that can legitimately be claimed by one's own prowess and usefulness to society.

As such, we must come to the understanding that within a value backed economy, high quality education must be available for all, as underlined in the central tenets of the constitution. Furthermore, where applicable, individuals being educated may also be paid in currency in order to properly represent the flow of value, and to provide a secondary incentive to pursue valuable activities.

At the centre of this, as in today's society, a mandatory curriculum for completion by all children is likely unavoidable, but the traditionally associated pitfalls of test score stratified schooling may be comfortably sidestepped.

As expressed in the previous subsection, a curriculum may be produced within the teaching community by peer collaboration, arriving at a realistic spread of topics and goals for children at certain ages. Like other institutions, autonomy over teaching may be distributed and devolved down to teaching councils, who will have free reign over their approaches as long as certain key criteria are met. Like the Avalon school (mentioned previously in the chapter), a school may opt for less classroom time, and more open ended research work, leaving teachers to guide and mentor, rather than dictate.

On a wider scale, the teaching community may define specific subjects and activities which are required as part of the curriculum. This may include the basic topic of literacy, maths and science, but may also extend into a wider breadth of real world subjects, such as citizenship and democracy, the functionality of the various currency system platforms, and others.

Based upon these fundamentals, a scientific approach to education may also be gradually developed. Population samples might be invited to be assessed based upon their levels of various parameters, such as general intelligence, wellbeing and happiness, logical and reasoning skills, etc. Based upon this, the curriculum could actively and uniformly be improved in line with what is shown to be working. This would allow the teaching community to benchmark themselves against real, pragmatic performance criteria, rather than the non-transferable skill that is the written exam.

One of my favourite potential experiments would be the introduction of critical thought classes to harden children's minds against dogma, fallacious argument and closed ideologies. It would be highly interesting to see if teaching children fundamental principles at an early age would mitigate the occurrence of religious fundamentalism, political extremism and ideological coercion by others.

But the teaching institution's suzerainty should not end at childhood, or even young adulthood. One of the most outdated and stifling traditions of the modern educational establishment is that education is primarily for the young, and that individuals seeking education at more mature ages should be discouraged, either by prohibitive costs or social stigma.

In a modern, value backed economy, agility of skills is imperative, and so while the central curriculum should be mandatory for children, study and development should be a lifelong, integrated venture.

In recent years, flexible and effective systems have emerged which offer such opportunities to individuals to develop and learn around their day to day lives. Of these, one of the most celebrated is Khan Academy, a non-profit educational organisation created in 2006 by Salman Khan. The Khan Academy is an online system which offers micro lectures and activities for a wide range of topics, all of which are available for free. The academy features several innovative features, including a personalised learning engine to help students track what they have learned and recommend lessons, as well as a system for continuous assessment exercises^[30].

Khan academy is already well respected in its own right, and noted for its efficacy at endowing knowledge in students, but it is limited by its lack of legitimacy in the eyes of the professional world. With expensive, inflexible and time consuming university degrees holding monopoly over the measurement of skills, the scope for free, accessible educational systems is distinctly limited.

In a value backed economy, this needn't be the case. Teaching professionals may utilise the positive aspects of online platforms like Khan Academy in order to create a powerful network of accredited and recognisable courses, culminating in tangible qualifications. This may be used to supplement occasional community based classroom learning, project based work and other real life exercises, in order to create an on-demand education system that is agile, accessible, flexible and offers real results.

But online based learning is not solely reserved for the mature student, and its power must not be underestimated. In 1999, researcher, activist and polymath Sugata Mitra started the Hole in the Wall project to assess children's uptake in distance learning. For his first experiment, a computer was placed in a wall in the slums of Delhi in India, and children were encouraged to approach it and use it freely^[31]. During the course of the experiment, Mitra found that even without

supervision, the children actively sought out the computer, taught themselves to use it, and learned from the machine with surprising efficacy^[31].

As such, we may define a mandatory curriculum for children to follow under the guidance of teaching professionals, but we should in no way limit children to study only within its remit. By representing the core curriculum within the integrated online system, we may allow children to unlock access to additional courses as they progress, which they may pursue at their own leisure. This not only allows children to go above and beyond what is required of them, but also reawakens some of the wonderment and curiosity of learning that has been so drained from conventional school.

Such a system, integrated within the social platform, may offer a powerful link between qualifications, currencies and work, and may be used to build an accurate educational vitae for every individual using it. This alone unlocks tremendously powerful functions within a society, as skills can be instantly validated against the qualifications, individuals can be searched for based upon their skillset, and accurate cross sections of skills distributed through the population may be developed for data management.

An Integrated Social Platform

With an approximate view of the general functionality of a value backed currency platform, we may begin to tie together an integrated system to represent the functional society. This generalised view is shown in Figure 3.3-5, with interdependent systems linked by double ended arrows.

The pragmatic outcome of an integrated system of this sort is that individuals can actively track their participation in society through a consistent online profile. This profile might be similar in resemblance to a modern social networking profile, but could integrate the functionality of a bank account, a citizen's ID card, a curriculum vitae of qualifications and much more.

Through the profile, the citizen may be able to access their record of currency transactions, discuss and amend policy within the democratic citizens' link, access the open source community to propose and review ideas, access the educational centre to earn or view current qualifications, or enter the online pseudo-market to browse, buy or sell luxury goods. Furthermore, such a profile could be customisable, allowing the user to create a personalised newsfeed of items that may be of interest to them.

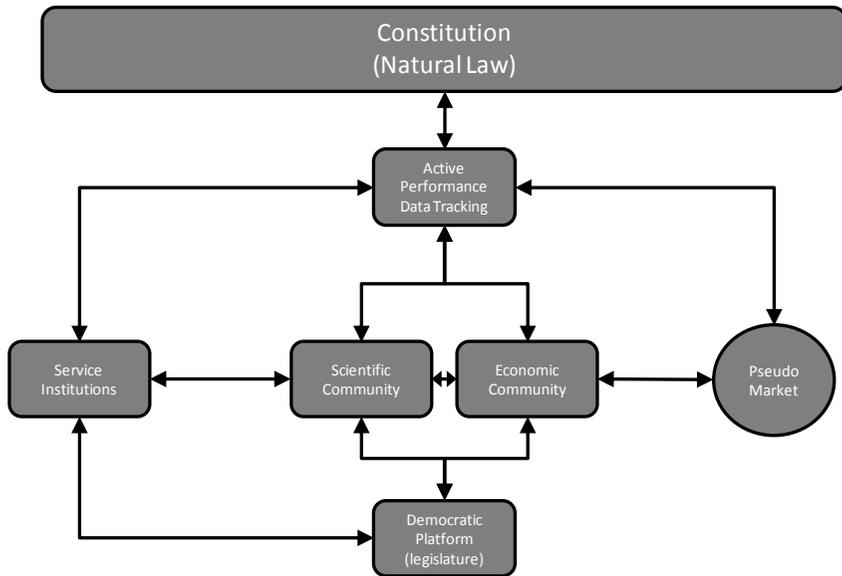


Figure 3.3-5: General view of the interlinked, integrated social platform

The power of this profile system is also salient from a societal perspective, as it allows automated and manually monitored systems to automatically allocate currency to valuable activities. For example, citizens who are logged going to the gymnasium on a regular basis may be automatically paid with currency, if this is shown to have a valuable affect upon public health and wellbeing. As mentioned in the previous chapter, citizens may also be paid for their usage of public transport.

There are however obvious drawbacks to this unified system, as it presents difficulty from a privacy standpoint. The system should therefore be made sufficiently robust as to not permit other users to view information that is sensitive, or that a user has set to private. As an aside, it also presents an ethical dilemma with regard to citizens who do not wish to participate in such a system.

This is undoubtedly a difficult scenario, but should an individual choose to live their life 'outside the system', some form of concessions should be made on a community basis to allow these individuals access to the basic inalienable rights outlined within the hierarchy of value. It is however forecasted that the amount of people who would choose to live outside such a system would be a distinct minority, simply due to the sheer autonomy, access and sense of citizenship that such a system would provide.

Admittedly, this proposed system is not complete, and likely possesses some logical holes that require plugging, but I implore the reader to build upon this concept with further thought experiment, or tear the pages to pieces and start afresh. Either way, by redefining the principles of the economy, we allow new and exciting forms of organisation, development and lifestyle to replace the industrial, pseudo-evolutionary systems of today.

Property

As a final aside, we must address the elephant in the room through all of this theory, and easily the most contentious within economic reimagining. Many prominent thinkers within the diverse post market movement see property as an ogre; the one true evil which must be torn from privileged individuals by any means necessary.

The views of the neo-communists on private property are of course well known, but even the more scientifically-minded amongst the crowd, such as the Venus Project and the Zeitgeist Movement, prescribe a world in which material possessions simply cease to exist, either by a complex transition of values, or a technological revolution of abundance removing any emotional attachment to physical goods^[32].

It must be said that I do not hold these views on property, and I foresee that even in a system as prescribed in this book, private property would likely still exist. There are multiple reasons for this viewpoint, but the most salient and overarching of this is self evident - these kinds of value are subjective.

Within the Venus Project's resource based economy, the argument typically follows that private property will simply not be necessary, as an abundance of access-based goods and services will become available for all to use^[33]. This argument has truth to it, as by enabling access to items which are typically used sporadically, or only in special circumstances, the propensity toward ownership falls - this is demonstrated through the rise of online sharing systems, such as Peerby.com.

The communists typically have a less well defined view of what would replace property, but generally their prescription involves the transfer of ownership over the means of production from private to public hands. Under this new ownership, the public may eliminate the fetishisation of commodities in order to better meet public need. Again, there is some truth to this, as the fetishisation of mundane items in order to prompt repetitive consumption is well documented (see chapter 1.2). However, both of these philosophies lack a fuller

understanding of the subtle and subjectivity of value, and they fall down in the same manner.

The truth of the matter is that sundry, utilitarian and mundane items may indeed be mostly superseded by access based approaches. There is no need whatsoever for each and every individual to be equipped with a power drill, or a full spanner set. For these items, access based systems to provide them on an 'as-and-when-needed' basis are fully workable and advisable in many cases. However, there is an additional depth to the value of physical goods which is ill-defined, nebulous and powerful.

Items which possess historical significance, which are associated with famous individuals, special moments or events are bestowed with a value that is not measurable in a utility sense. A Ferrari is made from approximately the same materials as any other high end car, but the heritage, the craftsmanship and the history demands that such a car is priced higher. Similarly, Bruce Springsteen's fabled yellow Fender Telecaster is a guitar which started life as a factory second, despite now being among the most valuable and recognisable instruments in the world.

It is because of this, that a pseudo market is required within the currency platform. Rightly so, this is separated from access based utility-type goods, as this is imperative to avoid a society of haves and have-nots, but the power of subjective value should not be underestimated. Don't get me wrong, by ending cyclical consumption, and decoupling commodity fetishisation from the goods that we need to survive, the public's attitude to property will likely shift radically away from the consumerist mindset of today.

However, the magic aura of luxury and collectable goods will remain, and dare I say should remain, as it is an aspect of human culture and history. Without sentimentality and magic surrounding physical objects, our art, our engineering and our passion are diminished, and for that reason, private property must be granted a space to exist.

Chapter 3.3 - References and Notes

- [1]. John A. Eterno, *Policing by the Numbers*, The New York Times, 18 June 2012
- [2]. Patrick Butler, *Sanctions: staff pressured to penalise benefit claimants, says union*, The Guardian, 3 Feb 2015
- [3]. David Osborne, *To improve schools, let teachers run them*, The Washington Post, 16 Jan 2015
- [4]. C. H. Douglas, *Economic democracy*, London: C. Palmer, 1920
- [5]. Evelyn L Forget, *The Town With No Poverty: Using Health Administration Data to Revisit Outcomes of a Canadian Guaranteed Annual Income Field Experiment*, Canadian Public Policy - Analyse de Politiques, Vol 37, No. 3, February 2011
- [6]. Guy Standing, *Unconditional Basic Income: Two pilots in Madhya Pradesh*, Background Note prepared for the Delhi Conference, May 2013
- [7]. Claudia Haarmann, Dirk Haarmann, *Pilot Project*, Basic Income Grant Coalition, 2014 - http://www.bignam.org/BIG_pilot.html
- [8]. Gilles Séguin. *Improving Social Security in Canada – Guaranteed Annual Income: A Supplementary Paper*, Government of Canada, 1994
- [9]. James Vincent, *World's first trillionaire is alive today*, The Independent, 06 May 2014 - <http://www.independent.co.uk/news/world/worlds-first-trillionaire-is-alive-today-9326532.html>
- [10]. Reentry Trends in the U.S., Bureau of Justice Statistics - <http://www.bjs.gov/content/reentry/recidivism.cfm>
- [11]. *Community or Custody? A National Enquiry*, Make Justice Work, September 2011
- [12]. Tony Thompson, *Poor food and stress 'responsible for rising number of deaths in UK prisons'*, The Guardian, 8 Aug 2010 - <http://www.theguardian.com/society/2010/aug/08/prison-natural-deaths-inquiry-call>
- [13]. Kimmitt Edgar, Dora Rickford, *Too Little, Too Late: an independent review of unmet mental health need in prison*, Prison Reform Trust, 2009
- [14]. F. Cheek, M. D. S. Miller, *Reducing Staff and Inmate Stress*, Corrections Today Vol. 44 Iss. 5 pp72-76, 78, 1982; also; Bruce Finley, *Prison horrors haunt guards' private lives*, Denver Post, 24 March 2014 - http://www.denverpost.com/news/ci_5510659

- [15]. Randy James, *Joe Arpaio, Toughest Sheriff in the U.S.* Time, 13 Oct 2009 - <http://content.time.com/time/nation/article/0,8599,1929920,00.html>
- [16]. Chris McLaughlin, *Grendon: A prison that works*, Tribune Magazine, September 19, 2010
- [17]. *Ibid*
- [18]. *Ibid*
- [19]. Nick Davies, *The mad world of Parkhurst Prison*, The Guardian, March 1994
- [20]. *Ibid*
- [21]. Erwin James, *The Norwegian prison where inmates are treated like people*, The Guardian, 25 February 2013 - <http://www.theguardian.com/society/2013/feb/25/norwegian-prison-in-mates-treated-like-people>
- [22]. *Ibid*
- [23]. Beth Simone Noveck, *Wiki Government: How Technology Can Make Government Better, Democracy Stronger, and Citizens More Powerful*, Brookings Institution Press, 2010
- [24]. Jennifer Pahlka: *Coding a better government*, TED (video), originally filmed Feb 2012 at TED 2012 - http://www.ted.com/talks/jennifer_pahlka_coding_a_better_government
- [25]. Hana Schank, *Boston Does Digital: What We Can Learn From A City That Is Getting It Right*, FastCoExist, 10 April 2012 - <http://www.fastcoexist.com/1679644/boston-does-digital-what-we-can-learn-from-a-city-that-is-getting-it-right>
- [26]. Clay Shirky, *Here Comes Everybody: The Power of Organizing Without Organizations*, Penguin Books, 2009
- [27]. Polly Curtis, *Tests blamed for blighting children's lives*, The Guardian, 20 Feb 2009 - <http://www.theguardian.com/education/2009/feb/20/primary-school-review>
- [28]. *Primary education 'too narrow'*, BBC, 20 February 2009 - <http://news.bbc.co.uk/1/hi/education/7896751.stm>
- [29]. Ken Robinson, Lou Aronica, *Creative Schools: The Grassroots Revolution That's Transforming Education*, Viking, 2015
- [30]. About Khan Academy - <https://www.khanacademy.org/about>
- [31]. Hole In the Wall Study - <http://www.hole-in-the-wall.com/Beginnings.html>

- [32]. The Zeitgeist Movement, *The Zeitgeist Movement Defined: Realizing a New Train of Thought*, CreateSpace Independent Publishing Platform; 1 edition (22 Jan. 2014)
- [33]. Jacques Fresco, *The Best That Money Can't Buy: Beyond Politics, Poverty & War*, Global Cyber-Visions, 2002

3.4 Transition

THE MOST DIFFICULT QUESTION to broach is of course the idea of transition. Given the current day as the starting block, what specific actions must unfold in order to transform human society into something approaching the concepts outlined? How can these abstract concepts be channelled into a practical and pragmatic framework?

The stumbling block of transition to a scientific economy has acted as a thorn in the side of even the most prominent and hardened activists when attempting to direct these arguments to the layperson. Market capitalism, for all its faults, excels in its ability to beguile, to motivate and to uphold an axiomatic status quo. An organised and scientific approach to economics demands infrastructure, scrutiny, development time and other luxuries uncondusive in a world of frenzied growth and unconstrained self directed motives.

The average person is not ignorant of the chasm between such philosophies, and as such, global economic redesign is easily dismissed as conceptual, utopian or unimaginably complex. The lack of rigor and regimen when discussing economic change therefore understandably, but frustratingly, prompts transition as one of the first questions on the lips of the intrigued and confrontational alike. Behind all this, the shadow of communism looms high, and the atrocious acts committed by such regimes adds taboo to discussion, and gravitas to counterargument.

The world of human society is naturally an unpredictable place, and it would be reckless of me to prescribe a single, clear path through our uncertain future. However, given the imperativeness of our shift away from traditional monetary capitalism, and the host of benefits that such a move could deliver, it seems deeply wasteful to leave such ideas as vague concepts on a page.

In this penultimate chapter, I will therefore present a family of potential paths to a scientific, value backed economy. We will discuss emerging trends in the context of a shift away from a monetary market economy, and how through

action today, these changes in culture may be nurtured into something new and exciting, in keeping with the tenets of this book. I will also be pragmatic in this approach, and attempt to clearly quantify the risks of each path, the potential upsides and the probable sticking points within the socioeconomic and political spectra.

3.4.1 Scenario One: The Testbed Society

The scientific method is a cumbersome beast. While this book rests the thrust of its argument upon scientific study, the approach is admittedly piecemeal at best. Through its various branches, science may give us glimpses of reality from a collection of vantage points, but understanding how these vantage points interconnect is a totally different matter. As we have seen so convincingly in the folly of neoclassical economic theory, macroscopic systems cannot necessarily be considered as the sum of their parts.

No endeavour draws pertinence from this fact as strongly as the construction of a socioeconomic model. The complex interaction of culture, economy and a social population currently defies any attempt at accurately modelling. Inevitably, the quandary leads us by the hand to an obvious conclusion; experimentation; and it is this keyword which comprises the core of our theoretical first scenario.

Overview

Scenario one unfolds through the creation of an experimental society, which safely and responsibly studies the socioeconomic, cultural and technical aspects of a post-market model. This model is subsequently adopted cumulatively by other nations, cities or smaller communities over an on-going transitional period.

Experimental Testbed

It is first prudent to illustrate what is actually meant by a 'testbed' or 'experimental' society. As terrifying as these words may sound to a fresh reader, the actual reality is fairly benign. The testbed society is a prototype system which tests, evaluates and optimises all required aspects for a functional society.

From the ground up, as we have perused in previous sections, this society must fundamentally comprise the basic infrastructure needs for its population. This is the first step of the experiment; to develop and test safety critical life-support systems. These will typically include energy generation, food production, water treatment etc.

Once the basic systems have been tested and validated to a high margin of safety, a population may be introduced to live within the society (more on the population later). As the population grows, additional systems may be implemented, and their performance and uptake reviewed. These may include systems for communication, economic requirements, entertainment and so on so forth.

Alongside study of the technical performance of the infrastructure, constant attention must also be afforded to the sociological factors affecting the participant population. This may be related to how individuals and groups are getting along together, how satisfied the population is with day to day life within the society, and any indications of unacceptable social stress.

As the study grows, a greater set of data may be collected relating to what varieties of infrastructure are the most efficient, the best economic and social policy to minimise interpersonal disputes, and what other factors act to generally improve social benefit. As this process continues, multiple smaller societies could be set up to peruse different configurations, or societies could grow in scale to assess how this changes any of the results.

Location

By necessity, the testbed society must be self sufficient and isolated from traditional market economies in order to properly evaluate the economic structure as a closed system. Deserts or isolated islands therefore present real potential, not only for isolation, but also for abundant tidal, wind or solar energy.

Isolation however is a double edged sword when considering the human lives involved in the testbed society. In the event of an emergency issue, whether this is related to failure of the economic system, or some form of large scale population unrest, it is imperative that failsafe redundancy is built into the experiment. This could be delivery of temporary humanitarian aid, or even evacuation and abandonment of the experiment if circumstances require it.

This therefore adds some considerable complexity to the creation of such a society. The technical aspects of the system cannot be adapted from existing infrastructure, as it must be suitably isolated from any extant human population. The entirety of the experimental infrastructure must therefore be constructed from scratch.

Furthermore, ethical issues may arise from creating such extensive infrastructure in otherwise uninhabited areas. Thought must be given as to how these

requirements can be balanced with impact on nature, wild animal populations or areas of natural beauty.

Population

Understandably, the enforcement of a testbed society onto a pre-existing population is unethical and fraught with issue. Radical social change can often be stressful, particularly if such a change is sudden. As such, the testbed society demands that its population is fully complicit in its participation within the social experiment, and holds the right to withdraw its participation at any time.

This presents several opportunities, but also introduces bias to the experiment. If all participants are volunteers, then it is highly likely that a majority would be interested in, or supportive of such a society before their participation in the experiment even began. This introduces potential behaviours that are overly protective and supportive of the experiment's aims, and hence may positively skew results in an unhelpful manner.

There are of course a range of options which are available to combat this. Inhabitants of the test society may be volunteers from around the world who are enthusiastic about the project, but the experiment must also actively include the most fervent naysayers in order to properly assess a realistic mix of social views. In this regard, financial incentives may be offered to openly sceptical citizens in order to attract their participation and gain more accurate data.

The aim of the experiment is of course to design a society which is robust and resilient to any social perturbation. As such, once basic functionality is attained, it will be required that various circumstances are explored. For example, the testbed could seek to understand how people of different economic background, religiosity, ethnicity or culture interact within the society, and how best to structure the economic model to meet the needs of all as fully as possible. Work could also be done researching the rehabilitation of violent criminals.

The selection of population must therefore meet the scientific needs of the experiment, but this may present ethical dilemmas. On the one hand, individuals knowing that they are part of a certain social experiment will act to skew data, as they would behave in a way that would aim for their own favoured outcome.

On the other hand, deliberately keeping the population uninformed of the experiments that they are included in is dubious from an ethical standpoint. This is especially problematic if such research involves the rehabilitation of potentially violent individuals, religious fundamentalists or hard-line political

extremists. Methods to minimise skew in the data would therefore have to be introduced, or systems may be put in place to protect populations from the potential failure of social programmes.

Funding

The key issue which emerges here is that this complex and lengthy experiment must be created within the confines of the existing capitalist structure; a socioeconomic model which as we have demonstrated, has significant disincentives to such a large scale, long term investment.

As such, many obstacles litter the path to creation of a testbed society. Not only must the experiment acquire large sums of monetary investment, it must also attract this with very little to offer for the investors (from a raw financial perspective at least).

The current marketplace is littered with similar technical concepts which offer much in terms of absolute value, but are not properly aligned with the commonly held ideals of monetary value and return on investment. A testbed society would require investment above and beyond any such extant ventures, and would likely also harbour significant taboo to detract potential investors.

There are however theoretical routes around this misalignment with the capitalist economy. Ironically, in this case marked income equality may work to the advantage of such a venture. Such vast wealth accumulated by the top 1% puts a great deal of gravity on the personal opinions of individuals. Should a wealthy individual decide, however unlikely, that they support the experiment, large sums may be funnelled into the testbed society with no requirement for return on investment.

This course of action is obviously riddled with risk and doubt by its nature. At their root, many extraordinarily wealthy people are supportive of the system that enabled them to build their wealth, and as such are unlikely to support an experiment which seeks to bolster its supersedence. Many however do actively engage in philanthropy and charitable activity, and so the involvement in a testbed society may extend from these desires in some way.

A further risk is the polluting of the experiment's integrity by the power of the vested individual. The presence of a rich and famous individual may place caveats upon the extent to which the researchers may probe the data, and even artificially alter the validity of the conclusions.

This must be avoided at all costs, and may be best mitigated by creation of a robust institution to oversee the experiment at all levels. In order to mitigate financial corruption by investors, it is imperative that this institution is structured in a democratic manner as discussed in chapter 3.3 (and mirrored by any proto-institutions created within the experiment itself). By following this approach, the experiment itself is protected from the corruption of those who oversee it, and those within the institution who succumb to corruption may be quickly relieved of their responsibilities.

However, personal involvement in the experiment by wealthy individuals is just one option to be explored. It is likely that the creation of the infrastructure for the testbed society will offer many technical and scientific challenges. The successful conquest of these inherent problems is guaranteed to hold a great deal of value to those who are willing to solve them. This would come in the form of exposure on a global scale, as well as showing an awareness of corporate social responsibility in a world so weary of corporate corruption and misbehaviour.

Designing and building the key life support systems within the experiment may therefore be viewed as a sound investment for large corporations looking to boost their image in their core markets. A further potential exploitation in this is that bitter rivals in the marketplace may be drawn into the fray. It is hard to imagine that if the U.S. aerospace giant Boeing offer their services to work on the cutting edge transport systems within the testbed society, then European rivals Airbus would not also demand to be part of the experiment to save face, perhaps lending their expertise in another field.

Such an approach is cunning, as it potentially enables exploitation of large corporate entities with no effect on the integrity of the experiment. The testbed acquires its needed technology and expertise, while the corporation receives recognition and bragging rights for its participation in a project which is both noble and technically challenging; both parties leave happy.

Care must however be taken to ensure that a rigorous framework is put in place to legislate that ownership of the technology produced is property of the testbed society and not the provider. As such, it is important that the testbed institution itself is created with all relevant legal statuses. This ensures that the technologies generated by third party corporations remain controlled by the open source, democratic community, preventing corporate interests taking the project hostage through withdrawal of key technology.

The optimum approach in all of this is of course a mix of the above. Multiple investments from both private individuals and an array of corporations mitigates the risk of a single group gaining control of the experiment. Rival corporations are likely to keep each other in check and fervently exploit any wrongdoing by their opponents. Similarly, individual investors are more unlikely to attempt any coup d'etat when there are other wealthy individuals waiting in the wings.

Achieving the Goal

The ultimate aim of the experiment is not only to provide sociological data and act as a technical demonstrator. While these may be the first steps along the journey, it is hoped that after the initial functionality of the testbed is achieved, the experiment will become a self contained society in its own right. As the experiment grows and more participants are invited, the line between what is experimental and what is an actual society will become blurred.

Obviously, data will continue to be gathered, but as problems are overcome, and technical systems become ever more robust, the testbed will evolve into a community in its own right, potentially mimicking some of the elements theorised in the previous chapters.

At this point, not only would the demonstrative goal of the experiment have been achieved, but the resultant society would have become a powerful bargaining chip for change in the global economy. Should the experiment deliver successfully on its aims, and produce a society which is optimised for human culture and sustainability, significant pressure would inevitably come to bear on the political leaders of the world to deliver similar results in their own nations.

Citizens of the world would no longer have to argue against the traditional rejoinders for a capitalist economy, as they would have solid evidential proof that a prosperous alternative economy is fully possible. This is where the transitional scenario becomes hazy, as the testbed society could provoke anything from pragmatic political implementation of the experiment's various elements, or even violent revolution of populations if the political establishment doubles down on a commitment against change. It is just too difficult to tell at this point.

At the other end of the spectrum, we must also not overlook the potential difficulties in this goal. It is highly likely that corporate owned media would hold a vested interest in downplaying the successes of the testbed and exaggerating any negative views. The extant institutions which prosper greatly

under an unequal and inefficient capitalist paradigm would likely apply their considerable resources against the experiment, in order to sway public opinion and placate pressure for social revolution.

Even more risk is added to the equation if the experiment undergoes significant hardship or failure, as this could easily mean the death knell in the eyes of an attention weary population, bombarded by political propaganda. The testbed would therefore become a make or break experiment, in which any form of setback could prove to be disastrous from a public relations perspective. Once public support and confidence is lost, it is unlikely that it could be regained.

This is a difficult tide to overcome, but there are potential ways around this. Corporate sponsorship or investment within the experiment (as outlined earlier) may direct the brunt of propaganda away from the testbed. Furthermore, the growing prominence of the internet as a primary source of news may cut through any deliberate misinformation surrounding the project. These are glimmers of silver lining in an otherwise grey sky, but the path to a post market age was never going to be an easy one.

Summary

Scenario one: The Testbed Society.

Positives:

- Produces a fully functional society in isolation with little risk to life.
- Gives the global population an aim to aspire toward, and a basis to demand change.
- Allows proper scientific reason to drive debate, by designing a standalone society outside the political spectrum.

Negatives:

- Potentially prone to corruption by investors.
- Vulnerable to negative propaganda by the political and media establishment.
- Ethical problems surrounding experimentation with real-life populations.

3.4.2 Scenario Two: The Top Down

The power of governments throughout history to enact change needs little explanation. For all their foibles, governed nation states have created the framework in which modern society exists. There are obviously incredible shortcomings in the concept of governments, as illustrated earlier within our discussion, but for many today, the government is viewed as the only vehicle by which social and economic change can come to pass.

Overview

Scenario two envisages a semi-benevolent government institution, or group of governments, who set in place legislation to facilitate the gradual transition away from monetary capitalism.

The "Semi-Benevolent" Government

As we have observed within our study of corporate-governmental fusion, politics is littered with corruption across the entire spectrum, and across the globe. This presents a real issue for any form of large scale transition, as the self interest of political actors is best rewarded in a socio-economic model which is built around such rationale. Monetary capitalism is inherently intertwined with governmental corruption, and hence corrupt institutions are symbiotically obliged to protect and maintain it.

It therefore follows that a wholly benevolent political establishment, which cares solely for the prosperity of all people under its demesne, is dismally unlikely to emerge within the current economic system. However, this is not entirely required in order to prompt a steady transitional process which is led from the top.

What is needed is simply a political outfit which is partially aligned to the ideals explored in this book, and while it may be comprised by corruptible individuals, it sets a series of processes in motion which bring economic transition.

The Anti-Austerity Manifesto

Within the political establishment, and amongst much of the Western population, there remains a bubbling undercurrent of anti-austerity fervour. In the UK, the Scottish National Party made the most significant gains in its history in the 2015 election campaign, by running on an anti-austerity platform^[1]. But this is nothing new, debt stricken nations such as Greece saw as many as 300,000 people protesting austerity measures outside the parliament building in 2011^[2], with the Spanish '15-M' protests attracting over 6 million protesters

across 58 cities^[3]. The vigour of anti-austerity politics within modern Western nations is therefore demonstrably strong, and well organised.

The link between anti-austerity and value backed economics is clear, but not one which is widely understood due to the complexity of debt financed currency. The anti-austerity groups support public services because they know that they are valuable to society, and argue that cuts to these services are self defeating. At the same time, the pro-austerity rejoinders simply rely upon emphasising the eye-wateringly high sovereign debt levels, and therefore raising the point that austerity is a necessity.

Both these approaches are fallacious, as they fundamentally trust money to be an accurate representation of value. Therefore, anti-austerity politicians must constantly sell their ideas as having some degree of cost efficiency, usually through convoluted arguments relating tax revenues and general social welfare to higher GDP. Fortunately for austerity supporters, such arguments are easy to dismiss when pointing to a debt that has ticked into the trillions, however meaningless that debt may be.

The rejuvenation of anti-austerity politics therefore lies in the dismissal of this supposed axiom. By proving that money is in fact not an accurate representation of value, the entire pro-austerity argument collapses. This is a deeply powerful political linchpin, and by framing the issues of economy on the basis of the financial system itself, a real discussion can begin; a discussion about how a financial system *should* work.

This is understandably a tough sell for any politician willing to take up the mantle, as money itself remains a trusted and beguiling axiom. It is therefore very unlikely that such arguments will be sufficient to win the public over outright, and such discussions are likely to invite ridicule from the more traditional party political soapboxes.

A political party looking to run their campaign upon a real value system of economics therefore reaches an impasse quite quickly. They must convince their electorate that a realistic currency system can be created, but they cannot create such an audacious system without convincing the electorate. As such, the party would likely have to rely upon the more basic, community currencies and small scale LETS systems - local level phenomena that are largely ignored by the current political establishment.

By developing a rich network of local trading systems, a party might be able to attain a level of support that would enable seats in parliament. However, it is very difficult to imagine such a party growing beyond this stage to actually form a government. While grassroots support may count for something, without significant financial contributions, and the support of the average voter on the street, small scale political parties will always struggle to win electoral majorities.

On the flip side, it is chronically unlikely that established mainstream parties would enact such change, as they already hold significant ties to businesses or wealthy interests, and are therefore limited in the audacity of their policy. Similarly, such parties already struggle deeply with corruption, no doubt enabled by the relative safety of their position as a major party. We are therefore stuck in some regards, as small parties must be the bringers of radical change, but must fight a series of tremendously hard battles to wield any influence whatsoever.

With this noted as a difficulty, we should continue assuming that such a semi-benevolent, anti-austerity party has managed to grow from a minnow into a powerful force. If such a party existed and was able to enact large scale financial reforms, what would the resulting system look like, and how would the process unfold?

A Credits System

The creation of a supplementary system of currency by the government is the most sensible first step. Such a system would allow the basic underlying principles of monetary interaction to become salient to the general population, and in doing so, demonstrate the fundamental fallacies of the mainstream financial system. This system would understandably begin on a small scale, potentially through schemes that still possess monetary cost efficiency, such as the Universal Basic Income. Elsewhere, an expansion of the community based LETSystems could be rolled out, using an online format to streamline coordination.

Further development may lead to government awarded credits which can be exchanged for locally produced goods and services, but which can be earned on a simplistic, value backed basis. For instance, credits may be awarded for travelling by train, attending a gym, eating healthy food, volunteering in the community and so forth. The credits would by necessity be unconstrained by the conventional debt backed economy, and could be obtained by anyone.

But it must be noted that there are significant problems with this approach. It must also be considered that such a political party would have to remain in power for a significant amount of time in order to develop even a simple system as that described previously. This is difficult to justify from a democratic perspective. On the flip side, the ideological combat of politics also makes it possible for a successor party to spitefully dismantle such a system, simply because of its origins in the minds of political opponents.

It is however possible that benefits of the system would be immediately visible to the public, and any party that ran elections against the system would be routed. It is also possible that existing political parties will have to adapt their ideological stance and resort to reforming and progressively updating the system. Hence the public are offered a breadth of choices in a positive direction while maintaining the overall direction itself. Needless to say, it should certainly not be underestimated that shoehorning such a system into the political sphere is a difficult task. For now, we will continue the scenario assuming that a system has been successfully implemented and used.

From here, a coherent and organised sub-economy would develop within the wider financial economy. In many cases, such sub-economies already exist, but without support or coverage, such economies go largely unnoticed and underpopulated. With the legitimacy of government behind such systems, it is hoped that they would gradually become more mainstream, thus challenging individuals to reconsider their preconceived definitions of value.

It must however be said that a government lending its support to a cause is not always a benefit. Despite the benignity of community currencies and credit systems, it is likely that such a system will be ridiculed or even feared by the general population. Anti-government rhetoric is widespread and understandable, but the paranoia that it instils can be hopelessly irrational and absurd at times. So while the outcomes of a credit based system or an economy of community currencies may be generally positive, simply the tar of government may be enough to prompt protest or boycott, which would be difficult to recover from.

Liberation from Costism

None the less, as the system develops, a clear trend will hopefully emerge. It will become apparent to individuals that real, value backed interaction using such currencies offers a much greater social benefit than when dealing with debt backed money. The public obsession with cost will therefore hopefully begin to wane, as it becomes self evident that market based concepts of cost suffocate value rather than nurturing it.

With this public shift in emphasis, it is hoped that a gradual, peaceful transition might occur, as a more refined and mature credit system removes the conventional necessity to interact with the monetary economy. In time, this modest system of credits may be expanded to resemble a primitive form of the currency platform of the previous chapter, thus inviting more individuals to rely solely on value backed currency in daily life.

Through this transition away from conventional money, the rich will not be robbed of their estates, but would instead become progressively less able to enact change to their own favour - their money would hold less power over the populace, and less sway in the world of government.

We however come to a sticking point if this rebalancing of influence towards the general population continues. It is likely that despite their estates remaining unmolested, the wealthy would take umbrage to their withering power over society. As such, it is possible that some degree of subterfuge, sabotage or potentially even violence may be used to reverse this flow of power away from the few. It is unclear exactly how this might be combated, but with a robust, distributed system in place, insidious individuals would have their work cut out for them if they were to launch a nefarious endeavour.

The attractiveness of this scenario cannot be downplayed, as the population's shift away from reliance upon the financial markets would bring tremendous monetary de-stabilisation. The anaemic economy, already bloated with debt, would struggle to remain functional, as individuals begin trading emergent currencies, and conventional consumption falls.

Mass banking collapse would be a probable result, along with sovereign debt failure crippling nations, and abruptly declining consumption bringing business to a halt. Why is this apocalyptic vision attractive you ask? Because as such events unfold, individuals and businesses would have little other choice than to transition across to using new, better currencies.

Furthermore, the sight of a cataclysmic financial collapse, juxtaposed with the productive continuation of a bustling currency platform would truly soil the reputation of the monetary capitalist economy. In line with this ideal, varieties of business which add no value to society would find themselves obsolete, with no currency to represent their false forms of value - Schumpeterian creative destruction would bite down upon capitalism itself.

But what of materialism and the beguiling wonders of our current economy? It is unlikely that individuals will adapt their culture to a fairly abrupt shift in economic prerogatives, especially one which might unfold within a single lifetime. As such we must broach a scenario where individuals still desire their golden trinkets of the capitalist age, and continue their patterns of consumption unabated. This scenario is equally troublesome, as if demand exists in a capitalist economy, business will provide. Thusly, small pockets of luxury producers may continue to prosper, keeping the consumption driven economy alive and undermining the robustness of the youthful currency platform.

This may seem irksome, but in actuality such consumption is inconsequential. In time, it will likely be realised that such patterns of behaviour are difficult to eliminate entirely, and a scientific solution would be proposed. Therefore, as described in the previous chapter, a value backed economy might implement a pseudo-marketplace, within which consumption of beguiling luxury goods may be partaken in a stable and sustainable environment. In the meantime, the provision of luxury goods would likely be the swansong of capitalism, as it would be unlikely that sufficient gross purchasing power remained to prop up an economy in its dying throes.

Summary

Scenario two: The Top Down.

Positives:

- Project carries the gravity of government, and thus is granted legitimacy by the public.
- Promotes obsolescence of traditional markets.

Negatives:

- Severely unlikely that a small party could find itself in a position to enact change.
- The ingrained nature of 'costism' may prove difficult to combat.
- Defence of markets by the wealthy and influential may hamper change.

3.4.3 Scenario Three: The Bottom Up

Historically, sweeping change has been enacted by numerous methodologies. As explained in the previous sub-section, the power of the state as an institution has been instrumental in historic shifts. However, it must also be considered that the state functions on the fuels of compliance and social consensus. Without recognition of this authority, and consensual compliance to it, government is little more than a group of people in a room.

At the other end of the scale, we have the humble population, who are in reality the true arbiters of power, though they may not realise it. The general population are endowed with the seldom exercised capacity to reject the fundamentals of the social system within which they participate, thus forcing the hand of the presumptive political investors.

It is the general population who are paid to fight wars, who oil the gears of abstract economic consumption and who man the institutions that govern day to day life. Without these individuals consenting to such occupations, their legitimacy is nullified, and those few who would attempt to imprint their own desires upon society are neutered. This set of concepts is the basis of our third and final scenario for transition.

Overview

The third scenario which we will consider is centred on the power of the population. In this scenario, groups of normal citizens organise themselves to create the institutions and social protocols which will push society through transition. With little option but to accept these trends, the political establishment is forced to adapt in order to survive and retain its relevance.

Economic Democracy

The important thing to note with regard to population driven emergent socio-economic systems is that they already exist and are likely doing business in your very town or city. According to LETS Link UK, as many as 450 local exchange trading systems exist within the UK, with over 40,000 people regularly interacting with these systems^[4].

Despite being relatively well established, these kind of LET Systems are under populated, are given scant coverage in media and are in no way viewed as a system which might supersede modern economics. Similarly, worker owned cooperatives are commonplace within the economy, but are typically

outnumbered, outgunned and under-resourced when compared with the wider marketplace.

The proliferation of these systems into a united, widespread and recognisable network of value backed proto-economies is imperative to a popular shift in understanding. Against the beguiling tide of capitalism, the growth of these systems is problematic, as consumerism's propensity to seduce is obvious. Campaigns of awareness relating to these kinds of systems are another possibility, but prone to difficulty due to the complexity of the concepts .

So we are left with an issue; while systems exist that mimic value backed economics, these systems remain very much on the fringes of society and lack any real legitimacy in the eyes of the public. To generate interest in these systems, and prompt them to grow, it is possible that there must be some kind of triggering event.

In the case of Greece, the explosion of LETS style systems came unsurprisingly alongside the nation's teeter on the brink of total financial collapse. It is hoped that a proliferation of these systems does not rely upon a turbulent destabilisation of conventional monetary markets, but this is a notable sticking point that should not be underestimated.

Development of the Platform

Assuming that the proliferation of community based trade systems has led to a deeper understanding of value backed economics in the community, three potential processes may unfold, all of which are not mutually exclusive to one another. The first is the informal restructuring of these disparate community based schemes into a reasonably unified platform, which may be generic across regional boundaries. This path presents its own difficulties, as territorialism may amplify the differences between alternative regional systems, with certain areas becoming too attached to their own way of doing things. This is not necessarily a stumbling block, but would create unnecessary complexity in any resulting system of currency.

In the event that the regional community based systems are not properly matured, or are embroiled in argument with one another over which system is most effective, a separate, open source development may be constructed by a budding community. Open source offers us our second possible path to development. In this case, the wider usage of community based, value backed currencies within the population will lend itself to a more enthusiastic uptake of such a development, rather than being a direct foundation.

Open source offers some significant benefits over the stitching together of regional schemes, as it allows a ground-up philosophy to be implemented from day one, driving the design of the platform towards the end goal of widespread usage. Despite this, an open source approach remains problematic, as organising and executing a complex developmental project is fraught with uncertainty and difficulty. Such a system would likely have a very long lead time, due to the steep learning curve, and the reality that most open source developers work in their spare time.

Furthermore, open source development is often invisible to the public, and would not garner the popular attention that community based schemes may have already attracted. As such, the danger remains that an open source system would be created, yet no one would care to use it, or even know of its existence. This leads us nicely to our third potential path.

The third process offers an interesting alternative to both the 'from-scratch' open source development, and the community based piecemeal approach. Within the extant market economy, it may not only be possible, but potentially profitable to create a product which resembles a primitive form of the currency platform described in chapter 3.3.

Such a system may sit between the emergent, value backed economy and the functional market economy, generating monetary revenue through advertising or other means. The creation of such a platform would therefore be a perfect transitional model, bridging the gap between traditional capitalism and the new, emergent forms of currency. Additionally, significant impetus would be placed upon the creators to promote, publicise and grow their userbase, a prerogative which might be missing from the more open source style of production.

This approach however also throws up distinct difficulties. It would be unlikely that a private company would willingly lay down their profits as the system develops. The system would therefore likely be hampered by compromises in order to safeguard profitability. Similarly, while the private system may inspire similar, open source developments, litigation surrounding IP would seem highly probable. We may therefore view the private approach as a possible scenario, but one that would likely be a crude, transitional demonstrator of the general concepts, rather than an endeavour in its own right.

In reality, these courses of action are in no way mutually exclusive, and a transitional period would be significantly more stable and flexible if all three trends were occurring simultaneously to varying extents. In this regard, the

population would bear witness to an emergent explosion of value backed economics, the effects of which would be both didactic and accessible. The more a population comes to understand such concepts, and the more they opt to engage with them, the greater the momentum in a shift away from traditional market capitalism. Furthermore, as such value backed schemes grow and proliferate, the trend is inherently towards convergence, which allows a coherent economic system to gradually emerge from many, united by basic, underlying principles of value.

Growth and Succession

From here onwards, the trend is predictably similar to scenario two. Market based forces may try to quash the progress of these schemes, but are ultimately left at the whim of whatever currency system the populace grants legitimacy to. Therefore gradual erosion, obsolescence and collapse of traditional market systems is inevitable alongside the growth of new currency platforms.

The main defining feature of this scenario when compared to scenario two is that the government remains on the outside of the development, rather than championing it from within. On the face of it, it is difficult to directly assess how a government might respond to a surging system of community currencies, and a bubbling open source platform of exchange.

On the one hand, such a system leaves a government with a significant hole in its taxation revenues, as goods and services that were once exchanged using taxable money are now performed online or in the community using emergent currencies. As such, it is highly likely that some attempt might be made to regulate, or even outlaw certain mechanics of exchange in order to cling on to taxation. For private developments, this would be quite straightforward, as the company would simply be fined for their activities, however for open source builds, the scenario becomes more complicated.

A government would struggle to keep control over a distributed, open source system with no real owner. The upshot of this could result in tremendously underhanded tactics to forcibly shut down the system, whether this is raiding the homes of key developers, forcing ISPs to block related sites, arrest, seizure of goods, etc. None of these actions are without precedent in Western governments, and their potential occurrence should not be dismissed when considering the entanglement of government with financial interests.

Such actions would however be toxic to public opinion, and mass unrest would be probable. A clamp down upon the services which individuals use on a daily

basis would be viewed as a tremendous insult to the population, especially amongst the poor and vulnerable. Governments might therefore walk a difficult line, knowing that such harsh clampdowns on emergent systems would certainly result in electoral defeat. The only sensible course of action in this regard would be for a government to sanction the usage of such currencies and accept taxation in that form, but this may be too rational an approach to reasonably ask for. The exact solution to this quandary is unknown.

On the other, more positive hand, aside from loss of tax income, governments may view the new systems as laudable and beneficial to social wellbeing. By doing this, nations could earn bragging rights in the eyes of the international community, whether this is based upon reducing poverty, unemployment, crime, or otherwise. It must however be said that this path is unlikely outside the most incorruptible nations, as it is fairly obvious from the analysis in chapter 1.7 that governments are primarily concerned with appeasing the wealthy, rather than creating a functional, prosperous society.

Never the less, the growth of a currency platform within a wider market system is ultimately irreversible once a set of given conditions are in place. With a population who understand the concepts behind value backed economics, and the means to put these systems into action (community, internet, etc.), there is little that traditional governments and market actors could do to maintain their crumbling system on an indefinite basis. Insidious tactics may be employed by government and business to subdue local subsets of the groundswell, but with the fundamental understanding of value evolving within the populace, such institutions would inevitably be forced to adapt or die.

Summary

Scenario three: The Bottom Up:

Positives:

- A diverse, population driven transition is difficult to combat.
- A true democratic movement.

Negatives :

- Proliferating the understanding of value backed systems is difficult.
- Government interference may act to limit the social benefit of new currency systems.

Conclusions

A set of three potential transition scenarios have been detailed here, but this should in no way be considered an exhaustive list. What should instead be apparent is that there are a myriad of potential paths that may lead to transition away from monetary capitalism, and many of these may not be mutually exclusive.

For example, there is nothing to say that the three scenarios outlined here cannot happen simultaneously, perhaps in different nations or communities. Indeed, the nebulous nature of transition dictates that a single, clear-cut path is unlikely. As such, I invite the readership to not only critique the potential paths presented here, but also to propose their own distinct visions of how a transition may unfold. By understanding the prerequisite criteria behind each broad approach to transition, engagement in relevant activism and politics becomes more effective and coordinated.

With this in mind, and rounding off all that we have learned thus far, we may summarise potentially useful endeavours to rally society in the direction towards a value backed economy. This will be the topic of our brief final chapter.

Chapter 3.4 - References and Notes

- [1]. Angus MacSwan, Andy Bruce, Alistair Smout, *Scottish Nationalist Party's Election Success Raises Possibility Of New Independence Referendum*, Huffington Post, 8 May 2015 - http://www.huffingtonpost.com/2015/05/08/scottish-nationalist-party-election_n_7243870.html
- [2]. *Greek strike and protests rock the government*, Socialist Worker, 6 May 2010 - <http://socialistworker.co.uk/art/20781/Greek+strike+and+protests+rock+the+government>
- [3]. Diego Beas, *How Spain's 15-M movement is redefining politics*, The Guardian, 15 Oct 2011 - <http://www.theguardian.com/commentisfree/2011/oct/15/spain-15-m-movement-activism>
- [4]. See: <http://www.letslinkuk.net/>

3.5 Final Conclusions, Activism and Support

AT THE END of this assessment, it is hoped that the quandary faced by human civilisation is somewhat clearer. We have analysed the functionality of the market system, and shown its numerous shortcomings, while also debunking the common arguments that market apologists will rely upon.

Looking forward, we have proposed a general set of concepts and processes to drive a potential post-market economy, while fleshing this conceptual framework out with functional elements. Finally, we have addressed, in an admittedly uncertain manner, how we might begin to move toward such an economy, and what troubles we might encounter along the way.

Due to the uncertainty surrounding such processes, descriptions of how things may unfold are understandably vague, but still offer benefits as a thought experiment. By gaining a robust understanding of these concepts, we enable honest and productive discussion, rather than attachment to romantic ideals.

And it is our own romantic ideals that we must battle with to maintain coherence. The important message to underline is that the process is what counts above all. Even if a post market economy resembles something wildly different from the ideas discussed in this book, the importance of an empirical, scientific and value backed process remains paramount. For some, this might be a difficult line of reasoning to adapt to, as so often we will see societal philosophers championing end results, infatuated with cities that must look a certain way, and economies that must work in a certain manner.

This style of argument is distinctly easier for the human mind to latch onto, as it appeals to aesthetics and emotions rather than actual goals. It is much harder to sell a concept which follows the data, and leaves many of our preconceptions abandoned or discredited. However, by being empirical and honest with the

uncertainties that we face, we endow ourselves with a much stronger stance, and one which cannot be readily shaken by those who argue the benefits of their own preferred social systems, while engaging in apologetics for the negatives.

In order to begin this difficult transition, we must rise above the human attachment to idealised societies, and take every point, however uncomfortable, into account. Only then will the true picture emerge, and will an effective model of reality be made possible.

Proliferation of Ideas

Of course, the more individuals who understand and engage with these ideas, the greater the weight of argument becomes. As such, when engaging in political debate, do not accept the traditional arguments from cost, race or marketplace taboo. Use the analysis in this book to rebuke these arguments, and present the reality of our quandary to normal individuals.

We must however understand that these are difficult ideas, and that not everybody is in a position to grasp them at present, so polite expression is paramount - win the argument, but do not gloat - debunk the arguments, but present new ideas in their stead. With this approach, worldviews are shaken, but not destroyed, allowing others to incorporate difficult truths into their belief system on a gradual basis.

We must however not run the risk of proselytisation, or fall into the dreaded 'us versus them' dichotomy. Challenge those who agree with the ideas with as much vigour as those on the free market side of the argument. Critique those who are in general support, but who push visions that are too unrealistic or idealised. Improve the quality of discussion amongst supporters, while simultaneously honing the arguments for usage on fervent naysayers. Reach out to opposing worldviews and find common ground - very few rational individuals would argue with the proposal for a more empirical, realistic and prosperous economy.

Mobilisation

At the same time as presenting argument, it is equally important to engage and impel others to immerse in the development, growth and proliferation of value backed economic projects. The bubbling undercurrent of change is already there if one looks hard enough, and by nurturing and growing these aspects of society, we can create a powerful alternative to the market mainstream.

Budding supporters of the ideas within this book should therefore join a local LETSystem, or other similar value based scheme (timebanking, cooperatives,

gift economies, etc.). For cases where this is not possible, individuals should motivate themselves to create new systems of currency, online or otherwise, which meet their needs. By encouraging a grassroots enthusiasm for new currency systems, open source and private developers can work to create a vibrant new landscape of complimentary currencies, and forcefully grab the attention of the disenfranchised population.

Petition your government at a local level to encourage and champion such value based practises, organising meetings with local cooperative delegates to show the true benefits offered by such operations. Share your proposals in local community meetings, with poverty charities or other local interest groups, showing how such systems can benefit members of the community who are struggling to get by despite their best efforts.

By following such simple, small scale steps, this gargantuan change in our society can be made possible. Through persistent effort, honest debate, and a clear headed approach, we can weather the coming uncertainties and prosper through the end of oil, changing climate, the population explosion, and any other phenomenon that besets us.

However it will take a serious reanalysis of our own beliefs and preconceptions in order to accomplish these lofty goals. I therefore invite you to take whatever steps you deem prudent to attain a prosperous, functional and long lasting civilisation on this planet. Together, for better or worse, we will take a ride into our uncertain future.

Notable Organisations

The Zeitgeist Movement

Originally existing as an offshoot of the Venus Project, The Zeitgeist Movement is now a largely independent organisation which holds lectures, creates video content and produces literature aimed at the transition to a 'Natural Law Economy'.

The Venus Project

The brainchild of futurist Jacque Fresco, the Venus Project produces artistic and technical concepts relating to a 'Resource Based Economy' (RBE) - the project also produces literature and video content.

Peerby

A Dutch online system which provides users with a sharing economy platform, allowing them to borrow various goods from their local community.

The Meta-Currency Project

A think-tank / advocacy organisation which produces theoretical literature and educational content relating to next generation currencies, value and money.

The Next System Project

The brainchild of cooperatives economist Gar Alperovitz, produces content relating to systemic redesign of the market economy, centred upon worker autonomy and ownership.

The Ingenesist Project

A 'crowd think tank' which aims to explore the next economic paradigm, producing literature and products based upon this field of study

Cybermated Farm Systems

A private company founded by NASA engineer Douglas Mallette, which plans to create highly advanced, automated and sustainable food production systems for usage in poverty stricken regions. Currently seeking investment.

LETS Link UK

The leading national body supporting Local Exchange Trading Systems. A voluntary non-profit dedicated to testing, researching and developing sustainable community economies.

About the Author

Gregg David is an aerospace engineer who has worked on numerous civil aircraft development programmes across Europe and beyond. He holds a Masters degree in Engineering from the University of Liverpool, UK.

The author can be contacted via:

www.a-future-uncertain.com

Questions, comments and criticisms are welcome.