

# Rethinking the Role of the Economy and Financial Markets

TONY GREENHAM\* & JOSH RYAN-COLLINS\*\*

\*New Economics Foundation, London, UK

\*\* New Economics Foundation, London. and University of Southampton, Southampton, UK

Correspondence Address: Tony Greenham, New Economics Foundation, 3 Jonathan Street, London SE11 5NH, UK. Email: [Tony.Greenham@neweconomics.org](mailto:Tony.Greenham@neweconomics.org)

**ABSTRACT** *The financial crisis is as much a crisis of economics as of the financial system. Inherent flaws in the modern monetary system overlay and magnify conceptual flaws in prevailing neo-liberal economic policy that rely on frameworks ill-suited to the current context of ecological and social problems. Our response therefore needs to address both the reform of the financial system and a fundamental reframing of economic policy away from an obsession with growth in GDP towards a focus on achieving high human well-being and social justice in harmony with ecological systems. Economic theory should better account for the laws of thermodynamics. Production should be redirected to maximize resource, not labour, efficiency, and to provide good jobs. Consumption should not be used as a proxy for well-being. Such an economic transition will not be possible without a more diverse money system, which is no longer dependent on growth, interest and debt.*

**KEY WORDS:** De-growth, financial crises, ecological economics, monetary reform, credit creation

*'Removing controls over the finance sector paved the way for its rise to dominance... Financial institutions, we contend, no longer act as servants to the real economy but as its masters...'*

*'There will be a collapse in the credit system in the rich world, led by the United States, ...[in which case] the probability of a financial crisis rises appreciably.'*

new economics foundation  
(Pettifor, 2003, pp. xxv-xxvi)

## Introduction<sup>1</sup>

Financial crises are nothing new. They have been a recurring feature of financial systems since the Dutch tulip mania of 1637. The most recent financial crisis manifested in globally co-ordinated bail-outs of banks by governments in October 2008 and was extensive in its scale and reach (Simms & Greenham, 2010). It was an acute economic shock that has turned into a chronic malaise, particularly in Europe.

We argue that financial crises are a symptom of a fundamental mismatch between our financial and economic structures and our social and ecological imperatives. We suggest that prevailing neo-liberal political economy is ill-equipped to solve this mismatch because it lacks the conceptual frameworks to even diagnose it correctly. It supports the primacy of the financial system over the economy, and in turn the primacy of the economy over social needs and ecological realities. This has been driven by a belief that financial innovation drives economic growth, that economic growth drives human progress, and that the environment will more or less look after itself. It may be that this theory was once a good proxy for reality, at least for a minority of the world's population living in the early industrializing nations, but it is now a belief system that has long outlived its usefulness. Reform of the financial system, although necessary, is not sufficient to restore the primacy of the interests of citizens over markets; a deeper and more fundamental economic transition is required. This needs more

than reforming regulations and institutions in financial markets. We must re-think the role of the economy.

## **Reframing the Role of the Economy**

The academic discipline of economics has always had different schools of thought. However, during the course of the twentieth century, the body of theory known as neo-classical economics came to dominate university economics departments, business schools, government institutions, financial services and industry bodies. Efforts to mimic the academic rigour of physics and mathematics led to an increasingly complex edifice of mathematical models which sought to describe the economy in terms of concepts such as marginal utility, Pareto optimization and supply and demand curves. These were built on simplifying assumptions of perfect competition, perfect information, zero transaction costs and rational utility-maximizing individuals. The internal consistency and elegance of these seemingly rigorous models was the key to their success. Arguably, neo-classical economics *became* economics (Spratt & Wallis, 2007).

Nowhere was this true more than in theories of financial markets, which were considered the most pure expression of rational behaviour and competitive markets, where new information was instantly reflected in prices – the much heralded ‘efficient markets hypothesis’. A vivid illustration of this was the rise and fall of the hedge fund, Long-Term Capital Management (LTCM). Founded by a former bond trader from the US investment bank, Salomon Brothers, and including two Noble Laureates in economics on its board<sup>2</sup>, the fund pursued arbitrage trading strategies to exploit pricing differentials that, in theory, should not have existed. After initial spectacular returns, in 1998 the fund’s bets went badly wrong, and it required a \$3.6bn bailout by investment banks, orchestrated by the Federal Reserve, who had to intervene because the scale of LTCM’s losses and imminent defaults on its obligations were deemed a systemic threat to the global financial service industry. Unfortunately, the experience of LTCM did not reverse or even slow the pace of deregulation of financial services. This had gained an unstoppable momentum from the combination of neo-liberal economic thinking with the lobbying of vested interests set to gain from ‘liberalization’ of financial capital. The collapse of Lehman Brothers a decade later precipitated a far larger global crisis and government-backed bailout of the banking industry. We argue that we need to revisit the theoretical foundations of economics to explain the crisis.

Of course, a moment’s contemplation by the humblest economics student will lead to the realization that the highly restrictive assumptions about human behaviour and markets required by neo-classical theories are completely unrealistic, and yet these theories are used to justify market fundamentalism as the best (or only) basis of economic policy. Alternative approaches to economics that draw on other disciplines such as psychology, sociology and anthropology can offer far more plausible explanations of economic reality but are not so amenable to elegant model-making; rather the methodological ‘tail’ of economics has long been wagging the theoretical ‘dog’ (Spratt & Wallis, 2007). Furthermore, the theoretical dog now bears little resemblance to real ones.

John Ruskin presaged these debates in the 1860s when he argued that contemporary thinkers were taking an overly mechanistic approach to economics. His critique of basing a social science on deductive reasoning from unrealistic assumptions was scathing:

I neither impugn nor doubt the conclusion of the science *if its terms are accepted*. I am simply uninterested in them, as I should be in those of a science of gymnastics which

assumed that men had no skeletons. It might be shown, on that supposition, that it would be advantageous to roll the students up into pellets, flatten them into cakes, or stretch them into cables... The reasoning might be admirable, the conclusions true, and the science *deficient only in applicability* (Ruskin, 1862/2007, p.14. Emphasis added).

Neo-classical models of the economy omit vital information about ecological and social impacts. Furthermore, assumptions and abstractions that underpin economic theories are themselves often in conflict with ecological and social realities. So let us explore some of the fundamental flaws that might make the science of economics ‘deficient only in applicability’.

### **The Problem with Market Prices**

First, there is the problem of externalities - impacts that are not priced and so are not taken into account by markets. This is already well recognized by environmental economists, if somewhat underplayed. Markets value and assign costs (or prices) only to those things which can be exchanged. To be exchanged on a market, something must be subject to exclusive ownership and control and the ability to transfer that exclusivity. This implies it must be quantifiable in some way. Yet many of the things that constitute natural resources – the sun, the air, the sea, wild birds or biodiversity – cannot be quantified or exclusively owned and hence cannot be exchanged on markets. As a result their value is often unaccounted for and ignored in decisions of governments, corporations and individuals. At a broader level, national accounting and the concept of Gross National/Domestic Product records the destruction of natural resources as income. As we explore further below, it is a poor measure of human progress.

This points to a second underlying problem with today’s political economy for which the discipline of economics is not, perhaps, entirely to blame, but is complicit. It has lost sight of the point of it all. When the British Prime Minister argues that everything must be put second to the pursuit of economic growth, and that ‘we need to throw everything we’ve got at winning in this global race’ (Cameron, 2012), he neglects to mention for what purpose we should do this, or what the prize for winning the race might actually be.

### **The Problem of Confusing Ends with Means**

One aspect of classical economics that was retained undisturbed by neo-classical economists was the concept of utility associated initially with the moral philosophy of John Stuart Mill and Jeremy Bentham. Utilitarianism was a reductionist moral philosophy that judged actions by their outcomes. It held that the proper courses of action for individuals and governments were those that maximized pleasure and minimized pain, and that aimed for the outcome of the greatest happiness of the greatest number. Strictly speaking, the good to be maximized and pursued is not happiness, but the more mysterious ‘utility’. This concept underlies neo-classical economics, although Utilitarian philosophers might argue that it has been misused by it, and is treated as axiomatic despite the fact that Utilitarianism is very far from being an uncontested moral framework in the societies that govern with reference to neo-classical economics. From here we proceed more or less directly to the fetish-ization of economic growth.

The only practical way we can measure relative utility is by the price that a person is willing to pay for something, as this is a direct reflection of how much they value it. However, once utility is linked to price, it is logical to suggest that rising incomes, which

increase the means to purchase goods and services, will lead to rising utility. If we then equate utility to happiness, the result is that more money equals more happiness. This convoluted theoretical abstraction leads to the logical economic objective of continual growth of incomes and thus the continual growth of consumption.

This is problematic for two reasons. First, the dynamic of endless growth is in conflict with ecological realities, as we will argue below. Secondly, it turns out that consumption does not equate with happiness, or even utility, on either an individual or societal level. In the twentieth century, E F Schumacher argued, as Ruskin had before him, that consumption and material wealth were poor proxies for well-being, and it was therefore irrational to make these the focus of national endeavour:

For the modern economist this is very difficult to understand. He is used to measuring the 'standard of living' by the amount of annual consumption, assuming all the time that a man who consumes more is 'better off' than a man who consumes less. A Buddhist economist would consider this approach excessively irrational: since consumption is merely a means to human well-being, the aim should be to obtain the maximum of well-being with the minimum of consumption (Schumacher, 1973/1993, p. 42).

Since Schumacher wrote this, the science of well-being has advanced our understanding of the links between consumption, social capital and inequality (Stoll, Michaelson & Seaford, 2012). Many cite a 1974 paper by Richard Easterlin as heralding the beginning of this field of research; he found that economic growth in a country did not necessarily lead to a rise in average levels of happiness (Easterlin, 1974). In fact, beyond a certain level of material consumption, other factors have more impact such as quality of government and democracy, social capital and provision of family services such as childcare. Unemployment has a negative impact out of proportion to the loss of income and also affects the well-being of those still in employment. The quality of work is also important, with a sense of autonomy, control, mutual trust in the workplace and job satisfaction all contributing positively to well-being.

At an aggregate level, therefore, we simply cannot make the assumption that growth in GDP will result in improvements in quality of life. It has long been observed that many activities that contribute to real human well-being are ignored from calculations of GDP, such as friendship and strong community relationships. Equally, many activities that do generate GDP either merely defend our quality of life without increasing it, such as cleaning up pollution, or indeed actively harm our quality of life, for example, cigarette advertising (Nordhaus & Tobin, 1971; Daly & Cobb, 1989; Jackson & Marks, 2002). However, there are still few orators who have captured this as well as Robert Kennedy:

[Gross national product] measures neither our wit nor our courage; neither our wisdom nor our learning; neither our compassion nor our devotion to our country; it measures everything, in short, except that which makes life worthwhile (Kennedy, 1968).

For Schumacher, the confusion of means for ends in the pursuit of consumption was compounded by the search for economic efficiency in production. The search for ever rising labour productivity requires the replacement of labour with machines, and tends to de-skill jobs. Drawing on the Buddhist concept of 'right livelihood', Schumacher argued that this is self-defeating. The functions of work are not just to produce goods and services but also to provide fulfilment, satisfaction and opportunities for collaboration and social interaction that are cornerstones of human well-being. To replace labour with machines and rob workers of

their craft is to put the creation of goods ahead of the needs of people. This approach to production also creates further dependency on continual growth. The constant addition of capital creates a dynamic towards constantly increasing the scale of production, which in turn concentrates wealth in the hands of the owners of capital. Meanwhile, to prevent ever rising unemployment resulting from the displacement of labour from production, we require ever increasing production to generate new jobs.

Thus, in the developed economies, we find ourselves on a growth treadmill chasing increasing consumption that fails to increase well-being, and increasing production that is required to prevent unemployment. Unfortunately, the growth dependency of this economic system is now being tested against the capacity of the planet to sustain its resource demands and absorb its pollution.

### **The Inconvenient Laws of Thermodynamics**

Environmental economics is an attempt to deal with the problem of externalities outlined above, but still does not recognize any ecological boundaries to economic activity. This was made possible by a seemingly innocuous but highly significant modification of classical economic theory by the neo-classicists. Whereas classical economics recognized three factors of production<sup>3</sup> - land, labour and capital - neo-classical economics conflates man-made capital with natural resources, essentially assuming they are perfectly substitutable. This dubious accounting trick allows natural resource depletion and even the degradation of ecosystems to be viewed with equanimity so long as sufficient man-made capital is deemed to have been created.

However, it is clear that labour, capital and natural resources are complementary rather than substitutable. It may indeed be true that investing in better ovens and mechanical kitchen equipment can allow the same production of bread with fewer bakers, but without more flour and dough no amount of extra men and machines will bake more bread. A second fundamental problem is that the role of energy and entropy in the economy is underplayed at best, and ignored at worst, leading to a strange dissonance with the natural sciences. It also means that economic theory is remarkably bad at explaining how its primary objective, economic growth, actually occurs. Growth cannot be explained through increases in the quantity of the two factors of production, labour and capital, and so the 'residual' growth is deemed to arise from increases in the quality of these factors, or what is known as the 'technology multiplier'. Unfortunately, the residual growth that cannot be explained quantitatively is hugely in excess of the amount that can be explained by growth in capital and labour. In the words of ecological economist Robert Ayres, 'there is no theory, based on general behavioural laws, to explain quantitatively why some economies grow, but some faster than others and some do not grow at all' (Ayres & Warr, 2009, p. xvii). To find a more satisfactory explanation we need to include other factors in our model of the economy.

In contrast to environmental economics, ecological economics proceeds from a different starting point: that the laws of economics must be subservient to the laws of thermodynamics. There are two established laws of thermodynamics, an exception to which has never been observed. The first law, also known as the law of conservation, states that, within a closed system such as the earth, energy can be neither created nor destroyed. All the energy that flows into any transformation process – including all economic processes – must end up either as a useful product, a stock change or a waste. The second law of thermodynamics – the law of entropy – distinguishes different types of energy-matter in terms of their availability and usefulness to us as human beings. The law of entropy states that the availability of energy to do useful work ('exergy') is reduced by every transformation

process, whilst at the same time the non-useful component increases. Certain kinds of matter – such as fossil fuels – are low entropy and easily transformed into useful work. But in the process of transformation, their available energy is dissipated and we are left with high entropy matter – in the case of fossil fuels, a combination of heat, CO<sub>2</sub> and other wastes which we cannot re-use.

Such wastes and pollution, as we now know, have definite cost to human beings and the planet. The phenomenon of climate change, the toxification of the oceans and air and the resultant damage to species can all be thought of as ‘economic bads’. The same amount of energy-mass is still there but it has changed to a form that we cannot translate into work and in many cases reduces human welfare.

What are the economic implications of the laws of thermodynamics? We can consider this question from an energy and materials point of view, with both approaches being complementary. In a study of the US economy since 1900, Ayres, Ayres and Warr demonstrated that by taking proper account of energy flows we can explain the ‘residual’ economic growth that does not arise from changes in labour and capital, and thereby almost entirely dispense with the vague ‘technology multiplier’ (Ayres, Ayres & Warr, 2002).

In this model, improvements in thermodynamic conversion efficiency have a dramatic effect on economic output and act as the primary engine of economic growth. However, there is considerable evidence that the world is reaching a saturation point in terms of energy-conversion efficiency improvements and the supply of low entropy materials in general, and liquid fossil fuels in particular. The phenomenon of ‘economic peak oil’ is likely to see the price of liquid fuels rise to levels that permanently depress economic activity in developed nations as rising demand in emerging economies outstrips global production capacity and requires a rebalancing of resource consumption from the global North to the global South (Johnson *et al.*, 2012). Furthermore, research suggests that only half the oil and gas reserves which have been proven economically recoverable can be burned up to 2050 if we are to avoid potentially irreversible climate change (Johnson, 2012). As prices rise, new sources of energy are coming into being as economic theory would predict. However, as yet, there is no convincing evidence that they can replace fossil fuels in terms of the ease of conversion from raw material into useful energy. The costs of recovery are likely to be much higher than current costs, and the energy return on energy invested in production will be much lower.<sup>4</sup>

The ecological economist Nicolas Georgescu-Roegen (Georgescu-Roegen, 1970) developed an alternative theory of production that properly incorporates physical material flows as well as labour and capital. Crucially, he recognized that we cannot substitute labour or capital for flows of resources. Natural resources, which are subject to the laws of thermodynamics, must therefore be included as an independent factor of production. This renders the long established neo-classical ‘production function’ redundant or, as Ruskin might have said, deficient only in applicability.

## **Financial Markets: Understanding Money**

We have put forward the case that neo-classical economics takes insufficient account of natural resources and energy, and it fails to target outcomes based on real human well-being. We now turn our attention to financial markets, and the nature of the monetary system, as aggravating factors in causing dissonance between the economy and social and ecological goals.

Money is a social construct. Its creation does not follow physical laws any more than language follows physical laws. But if we accept the proposition that the economy must obey physical laws then does money also have to obey them?

In contemporary society, banks create money through extending credit and expanding their balance sheets.<sup>5</sup> When I borrow money from a bank, it does not transfer it from its or any other customer's account. It simply adds an accounting entry to its ledger in the form of an asset, because the loan agreement I have signed entitles the bank to a stream of repayments with interest. It then adds an equal and opposite entry (in accordance with the laws of double-entry bookkeeping) in the form of liability, because the bank deposit that now shows on my account is an 'IOU' from the bank to me. This is a very special IOU, however, because it is accepted by everyone including the government as payment for goods, services and taxes. The role of banks in creating the money supply is not widely appreciated, perhaps because it seems counter-intuitive that such economic power would be handed to private banks. As J K Galbraith observed, 'The process by which banks create money is so simple that the mind is repelled. When something so important is involved, a deeper mystery seems only decent' (Galbraith, 1975, pp. 18-19). Nevertheless, the role of banks in creating money is recognized by central bankers such as the Governor of the Bank of England: 'When banks extend loans to their customers, they create money by crediting their customers' accounts' (King, 2012).

Why is this important? There are three reasons for concern. First, the lack of understanding among public and technocrats alike of the role of money, how it is created and the socio-ecological impacts of this represents a serious democratic deficit. The system is unaccountable and there is no effective governance in the public interest. Secondly, failure to understand the role of money ensured that the build-up of the first-world debt crisis sat in a conceptual 'blind-spot' of economics, where it remained entirely unnoticed up until the financial crash. Finally, the monetary system itself, being based on interest-bearing debt, creates social, economic and ecological pressures that are potentially so severe and destabilizing that it is incompatible with the goal of a socially just and sustainable economy. We examine these problems below.

### **The Disconnect Between Real and 'Virtual' Wealth**

Pre-industrial economies focused on the production and accumulation of goods with concrete use value such as food, tools and livestock. These deteriorate over time, as do all products of the natural world, due to the laws of entropy explained above. However, as Marx noted, in modern capitalist systems the goal is the accumulation of abstract *exchange value* in the form of capital (or money) (Marx, 1867/1976). Not only does this virtual wealth not deteriorate in line with laws of entropy, it can grow by itself by the addition of interest, and even interest upon the interest (compound interest). This disparity between real world and virtual wealth was identified by the Nobel Prize winning scientist Frederick Soddy, who provided an entertaining example comparing two pig farmers to explain the contradiction.<sup>6</sup> The first farmer has two real pigs that require food and shelter and disposal of their waste. They have reproductive cycles and other natural limits on their ability to 'grow' and reproduce. The second farmer, in contrast, has two 'virtual pigs' who are financial instruments without physical existence and capable of multiplying without limit. Before long the law of entropy will limit the further growth of real pigs<sup>7</sup>, whilst the population of virtual pigs will continue to expand as long as confidence in their value is maintained. However, at some point will come a day of reckoning, because you cannot eat virtual pigs. The owners of virtual pigs will struggle to exchange them for real pigs, because the virtual pigs have multiplied out of all proportion to real pigs. In 2008, there was a sudden realization that it was impossible for the huge financial claims built up in the developed world since the 1980s to be converted into real assets. Unfortunately, despite significant debt impairments and bailouts from

governments and central banks, the financial system remains full of worthless ‘virtual pigs’: financial assets which the real world will never be able to fund (Daly, 2011). Soddy concluded that at the heart of the modern economy lay a fundamental fallacy:

You cannot permanently pit an absurd human convention, such as the spontaneous increment of debt (compound interest), against the natural law of the spontaneous decrement of wealth (entropy) (Soddy, 1980, p.30).

All debt is nothing more or less than a claim on future resources, including labour. For Soddy, the culture of exponential growth that dominates modern economic systems can be seen at least partially to derive from individuals’ obsession with converting perishable wealth, based upon real assets, into permanently enduring debt that is not subject to the laws of entropy and provides a permanent stream of future income (Daly, 1999). In reality, virtual monetary wealth cannot permanently grow faster than real wealth and still retain its value. Nor can claims on future labour increase forever without an intolerable impoverishment of the ‘debtor class’. For this reason, debt-forgiveness or ‘debt jubilees’ were a regular feature of pre-modern economic systems (Hudson, 1993, 2004; Graeber, 2011).

When state institutions in such pre-modern societies deemed that they had built up an excessive amount of claims on future incomes of citizens they would ‘reset’ the economic system by ‘wiping the slate clean’ and cancelling such unpayable debts. This was possible because it was generally the ruling class, temples, and other state institutions that were the creditors and they could take the pragmatic action of forgoing repayment of their debts for the sake of the greater economic and social good. In today’s financial system of privatized money creation, it is not nearly so simple.

The problem of virtual wealth disconnecting from real wealth is made much worse when we introduce a money system where new money is created primarily by the addition of new interest-bearing debt to the system. Generally, as the level of economic activity increases, a greater quantity of money is needed to serve as the means of exchange for the additional transactions. However, the expansion in the money supply requires an expansion in interest-bearing debt. The burden of servicing the debt increases, as does the share of future income demanded by creditors in the form of interest payments.

There are three options to maintain stability of the system. First, we see redistribution from the poor, who tend to be net debtors, to the rich, who tend to be net creditors. This has indeed happened to a significant extent during the period of credit expansion prior to the crash, particularly in the UK and USA (Galbraith, 2012). There is a natural limit to this process, however, when net median incomes drop too low for consumption demand to be maintained and the economy falls into recession precipitating a collapse in confidence, bank lending and asset values.

Alternatively, the system will maintain stability as long as we have continuous and exponential expansion in debt. Again, we can see this pattern in the decades leading up to 2008 and again this process will eventually hit a limit. As with all pyramid selling schemes, we eventually run out of new people to sell to. The marketing of mortgages in the USA to people with no employment, financial assets or prospects of sufficient income to repay the loans was the logical conclusion of this attempt to find new debtors to allow debt to continually expand relative to GDP.

The third option is additional growth in economic activity that yields an increase in income to outpace the increase in debt. This was the traditional route to keeping the system stable, and indeed the effectiveness of the debt-based money system was precisely as a driver of, and means of financing, rapid economic growth. However, despite much talk of the dematerialization of economic activity we have yet to observe economic growth that does not



require additional consumption of natural resources and energy. If it ever appears that we have achieved such ‘weightless’ growth it is most probably because we are breeding virtual pigs.

In fact, as we argue above, the evidence points instead to the increasing impact of resource constraints on economic activity. In summary, the financial system, and in particular the debt-money system, creates a growth dynamic that is disconnected from the true productive capacity of the economy and the natural resources that underpin production. This means that in the absence of continual growth, inflation, or widespread debt repudiation the system will inevitably crash (Kennedy & Kennedy, 1995).

### **Discounting the Future and the Misallocation of Credit**

Not only does interest on debt-based money allow virtual wealth to detach from real wealth, it also discounts the value of the future. For example, renewable energy appears more ‘expensive’ than fossil fuel energy largely because of the commercial rates of interest charged by banks or the more expensive infrastructure required to run such projects, which must be paid out over many years (Turnbull, 2008). Interest takes no account of the benefits for future generations of harnessing such abundant energy sources. Indeed, the late Richard Douthwaite argued that the prices set by the market at any particular time have nothing to do with long-term values, and in particular ignore the needs of future generations:

[T]he prices that emerge merely reflect the immediate wants of that fraction of the worlds’ present population fortunate enough to have the money to be able to express them.....This inevitably leads to a gross misallocation of resources in favour of the present (Douthwaite, 1999, p. 31).

A further cause of misallocation of credit is the incentive to create credit for speculation, most of which inflates asset prices and creates vast quantities of debt. Richard Werner, amongst others, has shown how the incentives facing banks drive them towards such behaviour (Werner, 2005). Such a monetary system is driven mainly by the confidence of banks and firms and is thus inherently volatile and pro-cyclical.

Hyman Minsky’s ‘Financial Instability Hypothesis’ describes multiple recurring phases in the capitalist process (Minsky, 1986; Keen, 2011). At the beginning of such cycles, profits are low and banks act more conservatively but over time they improve. Both banks and firms grow in confidence, becoming more leveraged with resulting over-investment in assets that results in asset price inflation which breeds even greater confidence; this eventually leads to ‘Ponzi-financing’ where banks lend on the basis of assumed increases in asset prices rather than anything related to the real economy; eventually, the ratio of debt to income becomes unsustainable and defaults begin, leading to contraction in loans. Growth and wages stagnate and the bubble eventually bursts as asset prices begin to fall. Debt-deflation ensues, a situation whereby real outstanding debt increases as real income falls, leading to the inevitable crash.

In the same way that banks do not have regard for the macro-economic impacts of their activities, there are also no incentive structures for banks to account for the social or environmental impacts of the activities that they finance. Low-carbon infrastructure is underprovided with finance, often because of higher short-term profits, while activities with negative externalities are funded.

## **Reconceiving the Economy and Money to Serve Society**

Going back to first principles, we argue that the purpose of the economic system is to support high human well-being and social justice within ecological limits. We will take it as axiomatic that in the long-term, and in aggregate, the interests of citizens and ecological sustainability are fully aligned. This is not to wish away short-term and localized trade-offs that must constantly be negotiated between environmental protection and social need, but simply to posit that it cannot be in the interests of humanity to destroy its own life support system.

This conflict becomes ever more acute as relentless growth in human consumption of natural resources begins to transgress ecological constraints – most potently in carbon, fresh water, biodiversity, topsoil and fossil fuels. We need to reframe the relationships between human well-being, social justice, ecological sustainability and the economic system. Growth in material production is not by itself sufficient to drive human progress, particularly once basic material needs have been met. As some have suggested, the very idea of economic growth was ‘in an important sense a discovery of economics after the Second World War’ (Nordhaus & Tobin, 1971, p. 509). Indeed, mainstream economic analysis such as classical and neoclassical theory had been hitherto uncomfortable with phenomena of continuous change (Fioramonti, 2013). In many cases economic growth can be both unnecessary and undesirable – termed ‘uneconomic growth’ by ecological economist Herman Daly (Daly, 2002, pp. 635-642). Perhaps most importantly, we must take seriously the possibility that we are reaching the point where further GDP growth in the developed nations may not even be possible. Similarly, it would be wise for emerging economies and so-called developing countries to examine the growth paradigm closely and carefully decide in which sectors to pursue growth and in which areas to avoid it. As the forefather of GDP, Simon Kuznets, famously remarked, policy makers should always distinguish between the mere ‘quantity’ of economic growth and its actual ‘quality’ in order to clarify what type of growth they want to achieve and ‘for what’ (quoted in Fioramonti, 2013). However, at a global level the economy is already well into ecological overshoot, with annual resource consumption equivalent to 1.5 Earths<sup>8</sup>, and this makes the current crisis qualitatively different from previous financial and economic depressions. Previous solutions cannot succeed, at least not fully, in solving our current predicament. We cannot grow ourselves out of the crises. We need a radical reconfiguration of how the financial system and economy function.

There are many elements to this new economy: a shift in focus from labour productivity to resource productivity; from policies to promote growth to those to promote well-being - to which good jobs are central; from taxes on income and employment to taxes on wealth and resource consumption; from concentrated ownership to mutual ownership and governance of global commons; towards the involvement of citizens in the co-production of their own public services; a more equitable sharing of paid and non-paid work; and from monopoly debt-based money to a pluralistic and diverse money system.

Fortunately markets, unlike the laws of thermodynamics, are a social construct. We are free to reconfigure them how we choose, and we offer here strategies for radical transformation of the monetary system, production and consumption.

## **Reforming Money**

In the USA in the 1930s a majority of economics professors supported a proposal, known as the Chicago Plan, to separate the roles of credit allocation and money creation. According to this plan, the power to create new money would be removed from banks and handed to a

democratically accountable public body, so the financial benefit of money creation would flow to the citizen. Banks would be left to carry out the function that people generally think that they have: the intermediation of savings and loans. The Chicago Plan, was championed by Irving Fisher (Fisher, 1936), and has recently received very favourable analysis from staff at the International Monetary Fund (Benes & Kumhof, 2012), who concluded that the plan would have boosted output and employment without any inflationary effects. In times of recession, additional money could be spent into the economy by governments, debt-free, rather than lent into existence by banks, with money being withdrawn later through taxation if necessary to prevent unsustainable booms and inflation. This frees the supply of money, or credit, from its current reliance on the fickle confidence of banks. As useful as such a reform would be, not least because of the dramatic reduction in general levels of debt that it would allow, it does not provide a complete answer.

Advances in understanding of complex flow networks have led to calls for greater diversity in means of exchange to improve the resilience of the financial system (Lietaer *et al.*, 2012). The use of only one means of exchange, namely state-monopoly money, is efficient but highly vulnerable to economic shocks. State money should therefore be complemented by non-state based 'local' or 'community' currencies. These are exchange and payment systems whereby money is issued by non-state and non-bank actors. Such currencies have been described as 'common tender' (Rochford *et al.*, 2012) to distinguish them from fiat currencies or legal tenders and are also known generically as 'complementary currencies' to denote that they work in tandem with national fiat currencies rather than aiming to entirely replace them.

Many such complementary currencies sprung up in both the United States and Europe during the Great Depression, to support businesses and local production as national currencies became scarce because of deflation (Fisher, 1933). One of the survivors of this period is the Swiss WIR system created in 1934 which allows member companies to trade with each other on credit without the need for cash settlement (Lietaer & Hallsmith, 2011, p. 117). Evaluation of the system suggests it has a stabilizing, counter-cyclical effect on the Swiss economy, as businesses use it more during recessions (Stodder, 2009, pp.79-95). In the past decade, local complementary currencies have resurfaced throughout Europe, often as a shield against the consequences of the introduction of the euro, which led to first inflation, and now severe deflation through austerity policies, in the periphery economies of the eurozone. Some of them are modelled on the principle of demurrage (negative interest), which makes them lose value over time and encourages circulation in the local economy rather than interest accumulation (Fioramonti, 2013). While Germany is home to the highest number of alternative currencies, many forms of local exchange systems have sprung up also in crisis-ridden Greece and Spain.

## **Reforming Production**

The emphasis on labour productivity, as noted above, means that we must perpetually increase production to maintain employment. We need to move to a different prime measure of productivity – resource productivity. It is the efficiency with which we use natural resources which will determine sustainable levels of production. We then should translate our success in producing material goods into reducing working hours. The economist John Maynard Keynes foresaw this when he predicted that we would soon solve the problem of production and only need to work around 15 hours a week. For Keynes, our most pressing problem would be how to fill our leisure time to live wisely, agreeably and well (Keynes, 1930/1963, pp. 358-373).

The idea of such reductions in paid work appear utopian in the midst of today's Great Recession, primarily because the relentless squeeze on real disposable incomes places even those with jobs on the margins of economic security. The dramatic reduction in general debt levels that would result from the monetary reforms discussed above would help alleviate this pressure, but other reforms are also necessary.

In particular house price inflation, and the associated increase in mortgage debt, has been shown to increase working hours for indebted households (Stratford, 2012). This makes it very difficult to implement a shorter working week. The removal as far as possible of economic rent-seeking, more equal distribution of resources, and shifting taxation from income and employment to accumulated wealth and resource consumption are also required. Rent-seeking in economics is defined as acquiring ownership over streams of unearned income. It is often conferred by special legal privilege, for example to install tollbooths on roads, but the most significant form of economic rent is ownership of land and natural resources. Land is provided by nature, and the charging of rent on land is simply the extraction of income from others without producing anything. It is therefore much more beneficial and socially just to levy taxes on such natural resources than to tax production. Instead, most modern economies tax the gains from land and other property rights more lightly than income from employment and enterprise. This distortion is compounded by the preference of banks to lend for the purchase of assets, in other words to lend against economic rents, than to lend for the creation of new assets.

### **Reforming Consumption**

There is undeniably pleasure in the consumption of goods and services, but most people are entirely aware that there is more to life than this. A study carried out for the UK government developed a set of evidence-based actions to improve personal well-being which identified five ways to personal well-being (Aked *et al.*, 2008). They are to connect with people, to be physically and mentally active, to actively take notice of the world around you, to keep learning and seeking new challenges, and to give generously of your time and energy to your community. Consumption of purchased goods and services beyond the satisfaction of basic need, and provision of a certain level of comfort and security, might support any of these five activities, but does not necessarily do so. Indeed it can often get in the way of achieving personal well-being. Dethroning crude materialism would bring us, and hopefully economics, back into harmony with a long philosophical tradition of enquiry into what constitutes a 'good life' and how to achieve it which stretches from Aristotle's concept of *eudaimonia*, or flourishing, to the modern day cultural theory of *buen vivir* in South America, which sees a harmonious relationship with our ecosystems as a cornerstone of human happiness and well-being. This is in stark contrast with Western narratives that see humanity pitted against nature, and recalls Schumacher's *bon mot* that man 'talks of a battle with nature, forgetting that, if he won the battle, he would find himself on the losing side' (Schumacher, 1973/1993, p. 3).

### **Conclusion: Learning to Live without Growth**

We can see from the preceding brief overview that the reforms required for markets to serve citizens, rather than citizens to serve markets, are very far from trivial. At the heart of the matter is a dominant theory of political economy that appears ill-suited to addressing contemporary challenges of social justice, inequality and destruction of our ecological systems. The role of natural resources and energy is underplayed in the otherwise magnificent

and elegant mathematical constructs of neo-classical economic theory. The contemporary financial system is based on debt-based money, and this defies the second law of thermodynamics by promising to be indestructible, and violates the first by promising something from nothing through the mechanism of compound interest. Finally, we have become focused on intermediate goals – growth in production and consumption – to the extent we have lost sight of both the ultimate goal – the good life – and of a non-negotiable imperative – the preservation of our eco-systems.

To address these fundamental flaws will require an economic transformation. This transformation can be summarized as learning to live well without growth, but this is a prospect that contemporary political economy finds deeply unsettling. We cling to the idea of growth like a comfort blanket. We place all our hope in every quarterly change in GDP as if our lives depended on it. To wean us off our growth dependency, we also need a change in psychology. Fortunately, there is a rich tradition among economists of anticipating and looking forward to the end of growth. Keynes viewed the prospect of humanity ending the struggle for subsistence with delight, and thought that eventually we would eschew the pursuit of material wealth, usury and the love of money (Keynes, 1930/1963).

For J S Mill the striving for endless growth was not only impossible, but ultimately fruitless. He believed that a stationary state would be prosperous, socially harmonious and prevent degradation of the environment, whilst not acting as any inhibition to cultural, scientific and artistic progress:

I cannot, therefore, regard the stationary state of capital and wealth with the unaffected aversion so generally manifested towards it by political economists of the old school. I am inclined to believe that it would be, on the whole, a very considerable improvement on our present condition (Mill, 1848/1936: p. 748).

Herein, perhaps, lies the key to us relaxing our desperate grip on the unstable and unreliable crutch of GDP growth. It is not so much the thought that growth might become impossible that will motivate us, but the realization that a world that can look beyond growth is both possible and desirable for its own sake.

## References

- Aked, J., Marks, N., Cordon, C. & Thompson, S. (2008) *Five Ways to Well-being: The Evidence* (London: new economics foundation).
- Ayres, R. U. & Warr, B. (2009) *The Economic Growth Engine* (Cheltenham: Edward Elgar).
- Ayres, R. U., Ayres, L. W. & Warr, B. (2002) *Exergy, Power and Work in the U. S. Economy 1900-1998*, Insead's Center For the Management of Environmental Resources, 2002/52/EPS/CMER .
- Benes, J. & Kumhof, M. (2012) *The Chicago Plan Revisited*. International Monetary Fund Working Paper. WP/12/202 (Washington: International Monetary Fund).
- Cameron, D. (2012) *Speech to the Confederation of British Industry*, London, November 19, 2012.
- Daly, H. (1980) The economic thought of Frederick Soddy, *History of Political Economy*, 12(4), pp. 469-488.
- Daly, H. (1999). On money, in: *Ecological Economics and the Ecology of Economics, Essays in Criticism*, pp. 133-167 (Cheltenham: Edward Elgar).

- Daly, H. (2002) Steady-state economics: avoiding uneconomic growth, in: J. C. J. M. van den Bergh (Ed) *Handbook of environmental and resource economics*, pp. 635-642 (Cheltenham: Edward Elgar Publishing).
- Daly, H. (2011) Growth, debt, and the World Bank, *Ecological Economics*, 72 (2011), pp. 5–8.
- Daly, H. & Cobb, J. (1989) *For the Common Good* (Boston: Beacon Press).
- Douthwaite, R. (1999) *The Ecology of Money* (Devon: Green Books).
- Easterlin, R. A. (1974) Does economic growth improve the human lot? Some empirical evidence, in: P. A. David & M. W. Reder (Eds) *Nations and Households in Economic Growth: Essays in Honor of Moses Abramowitz*, pp. 89-125 (New York: Academic Press).
- Fioramonti, L. (2013) *Gross Domestic Problem: The Politics Behind the World's Most Powerful Number* (London: Zed Books).
- Fisher, I. (1933) *Stamp Scrip* (New York: Adelphi Company Publishers). Available at <http://userpage.fu-berlin.de/roehrigw/fisher/> (accessed on 27 February 2013).
- Fisher, I. (1936) 100% money and the public debt. *Economic Forum*, (Spring), pp. 406-420.
- Galbraith, James K. (2012) *Inequality and Instability: A Study of the World Economy Just Before the Great Crisis* (New York: Oxford University Press).
- Galbraith, John K. (1975) *Money: Whence It Came, Where It Went* (London: Penguin).
- Georgescu-Roegen, N. (1970). The Economics of Production, The Richard T. Ely Lecture, *American Economic Review*, 60, pp. 1-9
- Graeber, D., (2011) *Debt: The First 5000 Years* (New York: Melvillehouse).
- Hudson, M. (1993) *The Lost Tradition of Biblical Debt Cancellations* (New York: The Henry George School of Social Science).
- Hudson, M. (2004) The archeology of money: Debt vs. barter theories of money, in: R. Wray (Ed) *Credit and State Theories of Money*, pp. 99–127 (Cheltenham: Edward Elgar).
- Jackson, T. & Marks, N. (2002). *Measuring Progress*. (London: new economics foundation)
- Johnson, V. (2012) *Unburnable Carbon* (London: new economics foundation).
- Johnson, V., Simms, A. Skrebowski, C. & Greenham T. (2012) *The Economics of Oil Dependence: A Glass Ceiling to Recovery. Why the Oil Industry Today Is Like Banking Was in 2006* (London: new economics foundation).
- Keen, S. (2011) *Debunking Economics* (London: Zed Books).
- Kennedy, R. (1968). *Speech at the University of Kansas*, Lawrence, Kansas, March 18, 1968.
- Kennedy, M. I. & Kennedy, D. (1995) *Interest and Inflation Free Money: Creating an Exchange Medium That Works for Everybody and Protects the Earth* (Philadelphia: New Society Publishers).
- Keynes, J. M. (1930/1963) *Economic possibilities for our grandchildren*, in, *Essays in Persuasion*, (New York: W.W.Norton & Co.).
- King, M. (2012) *Speech given by Mervyn King Governor of the Bank of England to the South Wales Chamber of Commerce* at The Millennium Centre, Cardiff, October 23, 2012.
- Lietaer, B. & Hallsmith, G. (2011) *Creating Wealth. Growing Local Economies with Local Currencies* (Gabriola Island: New Society Publishers).
- Lietaer, B., Arnsperger, C., Goerner, S. & Brunnhuber, S. (2012) *Money and sustainability: The Missing Link*, (Triachy Press: Club of Rome), retrievable from <http://www.clubofrome.org/?p=4478>
- Marx, K. (1867/1976) *Capital, Vol. 1* (London: Penguin).
- Mill, J. S. (1848/1936) “Of the Stationary State”, Book IV, Chapter VI in *Principles of Political Economy: With Some of Their Applications to Social Philosophy*, (London: Longmans, Green & Co.). Available at [http://files.libertyfund.org/files/101/0199\\_Bk.pdf](http://files.libertyfund.org/files/101/0199_Bk.pdf) (accessed on 27 February 2013)

- Minsky, H. (1986) *Stabilizing an Unstable Economy* (New Haven: Yale University Press).
- Nordhaus, W. D. & Tobin, J. (1971) 'Is Growth Obsolete?', reprinted from Moss, M. (ed.) *The Measurement of Economic and Social Performance, special issue of Studies in Income and Wealth*, Vol. 38, 1973, p. 509. Available at <http://cowles.econ.yale.edu/P/cp/p03b/p0398ab.pdf> (accessed on 25 February 2013)
- Pettifor, A. (ed.) (2003). *Real World Economic Outlook: The Legacy of Globalization: Debt and Deflation*. (Basingstoke: Palgrave Macmillan)
- Rochford, S., von Gunten, C., Mainelli, M. & Harris, I. (2012) *Capacity, Trade and Credit: Emerging Architecture for Commerce and Money*. (London: Z/Yen Group)
- Ruskin, J. (1862/2007) *Unto This Last*. (Minneapolis: Filiquarian Publishing, LLC).
- Ryan-Collins, R., Schuster, L. & Greenham, T. (2012) *Energising Money: An introduction to energy currencies and accounting*. (London: new economics foundation)
- Ryan-Collins, R., Greenham, T., Werner, R. & Jackson, A. (2011) *Where Does Money Come From? A guide to the UK Monetary and Banking System*. (London: new economics foundation)
- Schumacher, E. F. (1973/1993) *Small is Beautiful: A study of economics as if people mattered*. (London: Vintage Books)
- Simms, A. & Greenham, T. (2010) *Where Did Our Money Go? Building a Banking System Fit for Purpose* (London: new economics foundation).
- Simms, A., Johnson, V., & Chowla, P. (2010) *Growth isn't possible* (London: new economics foundation)
- Soddy, F. (1980) 'Cartesian Economics: The Bearing of Physical Science upon State Stewardship', in Daly, H. E. (1980). *The economic thought of Frederick Soddy*. *History of Political Economy* 12(4):p476
- Spratt, S. & Wallis, S. (2007) *From old economics to new economics: radical reform and a sustainable future*. (London: new economics foundation)
- Stodder, J. (2009) 'Complementary credit networks and macro-economic stability: Switzerland's Wirtschaftsring', *Journal of Economic Behaviour & Organisation*, 72(1): pp. 79-95
- Stoll, L., Michaelson, J., & Seaford, C., (2012). *Well-being evidence for policy: A review*. (London: new economics foundation)
- Stratford, B. (2012) *Does our current monetary system force us into an ecologically unsustainable pattern of economic growth?*. Dissertation for the degree of MSc in Ecosystem Services, University of Edinburgh. (Unpublished)
- Turnbull, S. (2008) 'Money, Markets and Climate Change', in Chester, L., Johnson, M. and Kriesler, P. (eds) (2008). *Contemporary Issues for Heterodox Economists, Refereed papers of 7th Australian Society of Heterodox Economists Conference*. University of New South Wales (Sydney: Society of Heterodox Economists, University of New South Wales) Available at SSRN: <http://ssrn.com/abstract=1304083> or <http://dx.doi.org/10.2139/ssrn.1304083>
- Werner, R. (2005) *New paradigm in macroeconomics : solving the riddle of Japanese macroeconomic performance*. (Basingstoke: Palgrave Macmillan)

## Endnotes

- <sup>1</sup> This essay builds on work with many colleagues at nef (the new economics foundation). In particular the sections on 'The Problem with Market Prices', 'The Inconvenient Laws of Thermodynamics' and 'Financial Markets: Understanding Money' draw on Ryan-Collins, Schuster and Greenham (2012).
- <sup>2</sup> The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 1997 was awarded jointly to Robert C. Merton and Myron S. Scholes 'for a new method to determine the value of derivatives'.

- 
- <sup>3</sup> Sometimes ‘enterprise’ is identified separately from capital as a fourth factor.
- <sup>4</sup> The concept and measurement of energy return on energy invested (EROI) was pioneered by Charles Hall of the State University of New York’s College of Environmental Science and Forestry. A list of publications on energy can be found at <http://www.esf.edu/efb/hall/energy.htm>.
- <sup>5</sup> For a detailed explanation, see Ryan-Collins *et al.* (2011) pp. 55-58. See also the essay by Ford and Philipponat in this collection.
- <sup>6</sup> For a full exposition and references of Soddy’s pigs example see Daly (1980).
- <sup>7</sup> Some animals are capable of exponential growth, but only for a limited period until they reach ‘maturity’. A hamster, for example, doubles in size each week from birth up to puberty and if it continued to grow at this speed on its first birthday we would be facing a nine billion tonne hamster (Simms, Johnson & Chowla, 2010) and, online, [http://www.youtube.com/watch?v=Sqwd\\_u6HkMo](http://www.youtube.com/watch?v=Sqwd_u6HkMo)
- <sup>8</sup> See [http://www.footprintnetwork.org/en/index.php/GFN/page/earth\\_overshoot\\_day/](http://www.footprintnetwork.org/en/index.php/GFN/page/earth_overshoot_day/)