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Issue no. 64, 2 July 2013

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Editor's Note

On 10 May 2013 a subscriber emailed that *throughout* the paper "Laboratory experimentation in economics" by Dimitrios Koumparoulis in RWER's issue no. 62 "portions of text have been taken verbatim, without reference, from the article 'Experimental economics under the microscope,' by Nikos Siakantaris, published in *Cambridge Journal of Economics* 2000, 24, 267–281." My inspection of the two texts fully confirmed this correspondence. On 11 May the Koumparoulis paper was removed from this journal's website, and apologies sent to the editors of the CJE, which they graciously accepted. I now also offer my apologies to this journal's readers. **Nikos Siakantaris** was working on a PhD in economics when he died in September 1997. I highly recommend his posthumously edited CJE paper.

Is it a bubble?

In the spring of 2010 the new Real-World Economics Review Blog held a poll called the Revere Award for Economics, named in honour of Paul Revere and his famous ride through the night to warn Americans of the approaching British army. The poll's purpose was to identify the three economists who, in the judgment of fellow economists, first and most cogently warned the world of the coming Global Financial Collapse. Over 2,500 of the then 11,000 subscribers to this journal (there are now 22,900) voted. They were asked who they thought were

> "the three economists who first **and** most clearly anticipated **and** gave public warning of the Global Financial Collapse **and** whose work is most likely to prevent another GFC in the future."

The three winners, in order of the most votes received, were **Steve Keen**, **Nouriel Roubini** and **Dean Baker**. Other big vote getters were Joseph Stiglitz, Ann Pettifor, Robert Shiller, Paul Krugman, and Michael Hudson.

The Standard and Poor and FT indexes have now reached their levels at the time of the 2002 and 2007 crashes**. Is it another bubble or one in the making?** The obvious people to invite to answer this question are those economists who analytically anticipated the Global Financial Collapse. So I have invited **Steve Keen**, **Dean Baker**, **Ann Pettifor** and **Michael Hudson** to do so. Their responses follow.

Editor

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http://www.paecon.net/PAEReview/issue64/Editor64.pdf

A bubble so big we can't even see it

Steve Keen [Australia]

What a difference three months makes. I first published this note on the topic of the stock market and whether it was in a bubble at the end of March ("The Debt Effect", *Business Spectator* 2013/03/30); at that stage the only apparent direction for the stock market was up. Now its volatility is starting, once again, to give traders nightmares.

Before the current turmoil began, Federal Reserve Chairman Ben Bernanke's hope was that rising asset prices would lead to a "wealth effect" that would encourage the American consumer to start spending again, and thus help the American economy finally leave the "Great Recession" behind. His predecessor Alan Greenspan argued in February that this would work because:

> "…the stock market is the really key player in the game of economic growth… The data shows that stock prices are not only a leading indicator of economic activity, they are a major cause of it. The statistics indicate that 6 percent of the change in GDP results from changes in market value of stocks and homes." (Greenspan 2013)

This is the so-called "wealth effect": an empirical relationship between change in the value of assets and the level of consumer spending which implies that an increase in wealth will cause an increase in consumption.

Greenspan's sage status is somewhat tarnished post-2007, so I don't think anyone should be surprised that his definitive statement involves a sleight of mouth. The "6 cents extra spending for every dollar increase in wealth" found in the research he alluded to was for the relationship between changes in the value of housing wealth and consumption, *not stocks*. In fact, the authors argued that the wealth effect from stocks was "statistically insignificant and economically small":

> "Consistent and strong evidence is found for large but sluggish housing wealth effects… the MPC [marginal propensity to consume] out of a one dollar change in two-year lagged housing wealth is about 6 cents…
>
> Furthermore, *a statistically insignificant and economically small stock wealth effect is found* … Additionally, there is evidence that the housing wealth effect is significantly larger than the stock wealth effect… these results suggest that it is necessary to take into consideration the potentially substantial difference between consumers' respective reactions to fluctuations in the housing markets and stock markets." (Carroll and Zhou 2010, p. 18. Emphasis added)

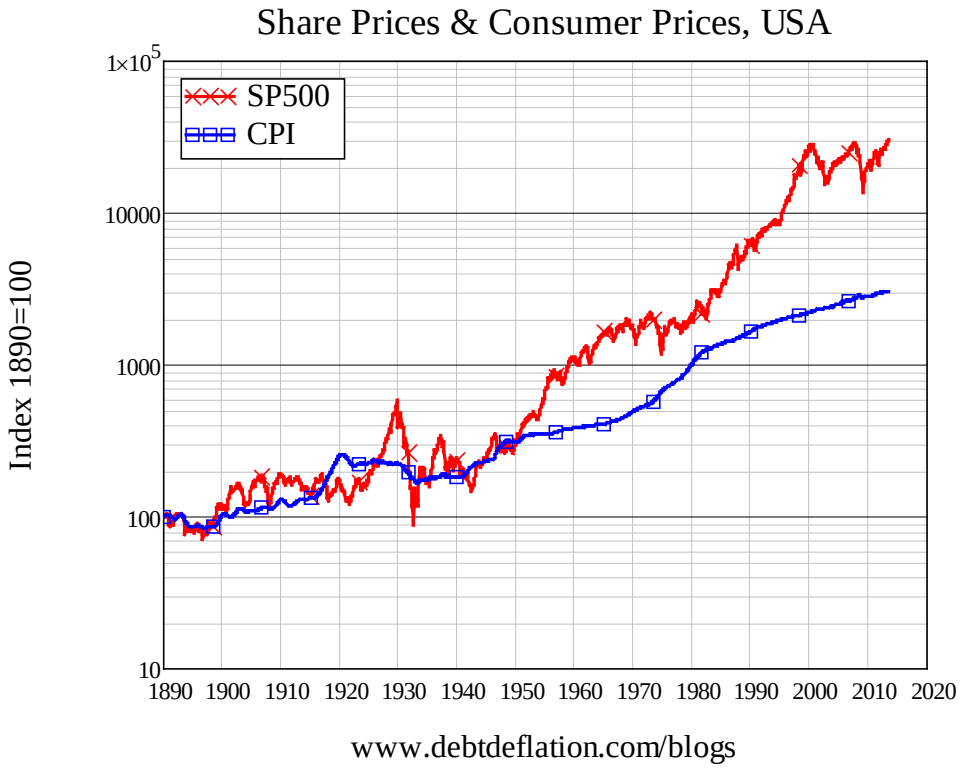
So the empirical data does not support Greenspan's notion that the stock market drives the economy (though the housing sector might). But equally the economy isn't booming sufficiently to make the reverse case that the economy drives the stock market. So what is causing the markets to boom right now?

Let's start by taking a closer look at the data than Alan did. There are a number of surprises when one does—even for me. Frankly, I did *not* expect to see some of the results I show here: as I used to frequently tell my students before the financial crisis began, I wouldn't dare make up the numbers I found in the actual data. That theme continues with margin debt for the USA, which I've only just located (I expected it to be in the Federal Reserve Flow of Funds, and it wasn't—instead it's recorded by the New York Stock Exchange).

The first surprise came when comparing the S&P500 to the Consumer Price Index over the last century—since what really tells you whether the stock market is "performing well" is not just whether it's rising, but whether it's rising faster than consumer prices. Figure 1 shows the S&P500 and the US CPI from the same common date—1890—until today.

In contrast to house prices, there are good reasons to expect stock prices to rise faster than consumer prices (two of which are the reinvestment of retained earnings, and the existence of firms like Microsoft and Berkshire Hathaway that don't pay dividends at all). I therefore expected to see a sustained divergence over time, with of course periods of booms and crashes in stock prices.

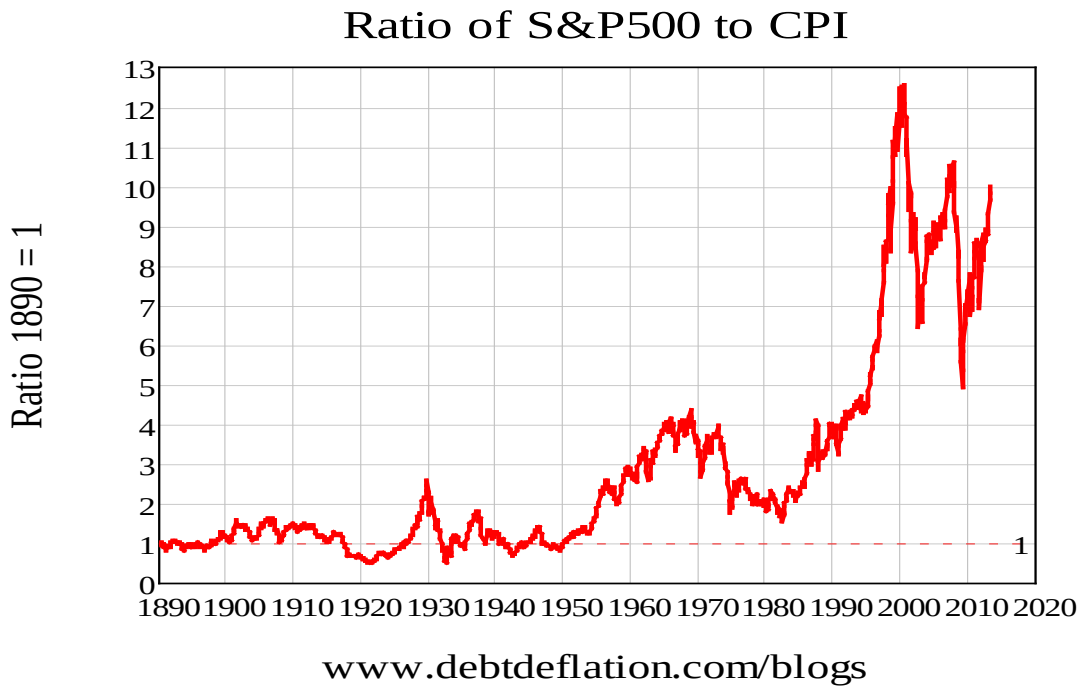
Figure 1: The S&PP500 and the CPI from 1890 till today



That wasn't what the data revealed at all. Instead, there was a period from 1890 till 1950 where there was no sustained divergence, while almost all of the growth of share prices relative to consumer prices appeared to have occurred since 1980. Figure 2 illustrates this by showing the ratio of the S&P500 to the CPI—starting from 1890 when the ratio is set to 1. The result shocked me—even though I'm a dyed in the wool cynic about the stock market. The divergence between stock prices and consumer prices, which virtually everyone (me included) has come to regard as the normal state of affairs, began in earnest only in 1982. Until then, apart from a couple of little bubbles in stock prices in 1929 (yes I'm being

somewhat ironic, but take a look at the chart!) and 1966, there had been precious little real divergence between stock prices and consumer prices.

Figure 2: Ratio of stock prices to consumer prices from 1890 till todays



And then, boom! What must certainly be the biggest bubble in stock prices in human history took off—and it went hyper-exponential in 1995.

In 1982, the ratio of stock prices to consumer prices was only 1.8 times what it was in 1915. By 1990, the ratio was substantial at 4 times—well above the level of 1929 (2.6:1) but below the peak reached back in 1966 (4.1:1). Then it just exploded to 12.5 times by the peak of the DotCom bubble in 2000.

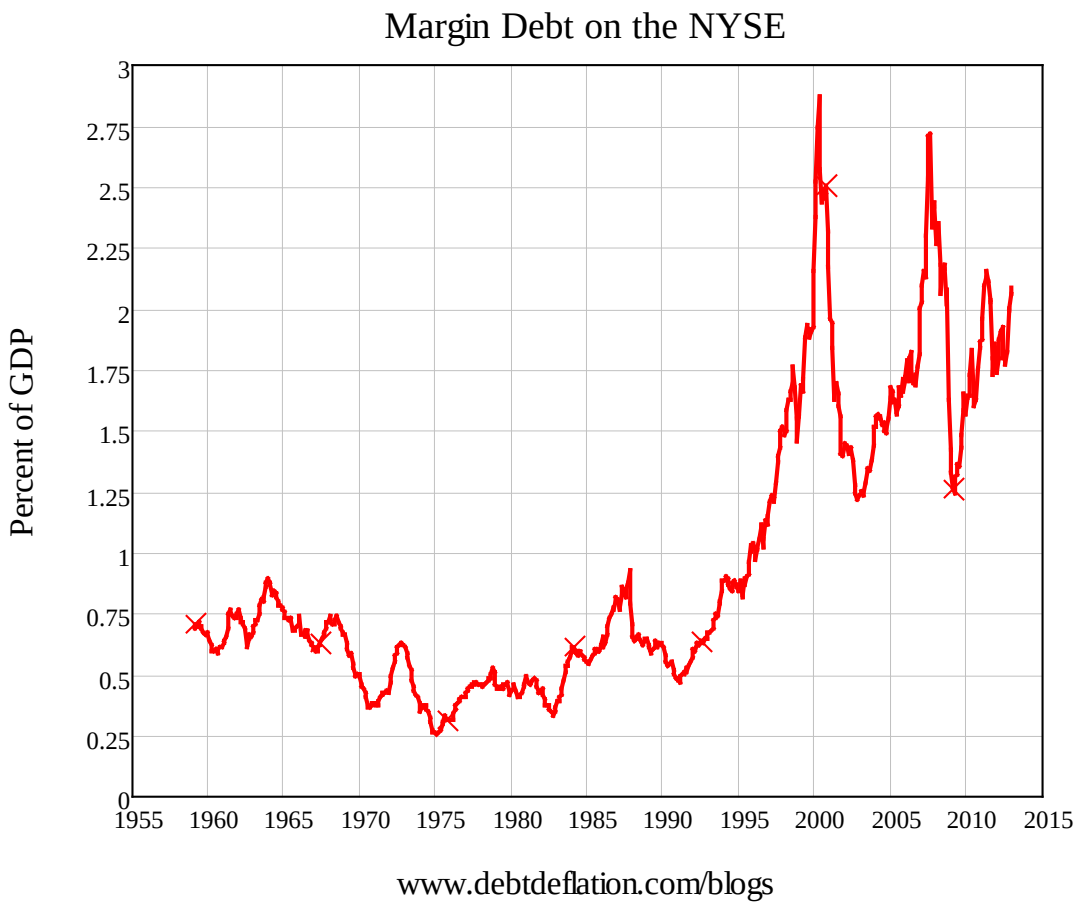
Since then, it's been doing the Jitterbug. The current rally has erased the crash of 2008 in nominal terms, but at a ratio of just over 10:1 today, it still stands shy of the two previous peaks of 12.5:1 in 2000 and 10.5 in 2008.

So are stocks in a bubble? On this view, yes—and they have been in it since 1982. It has grown so big that—without a long term perspective—it isn't even visible to us. It has almost burst on two occasions—in 2000 and 2008—but even these declines, as precipitous as they felt at the time, reached apogees that exceeded the previous perigees in1929 and 1968.

But this of itself doesn't truly establish that there is a bubble however, since as noted, even I expected to see a trend in the ratio of stock prices to consumer prices over time. Perhaps 1890-1950 was the abnormal and this is now a restoration of it?

So is there any other series that looks anything like this? Oh, let's try one at random—say, the ratio of margin debt (on the New York Stock Exchange) to GDP (see Figure 3).

Figure 3: NYSE Margin debt as percentage of GDP

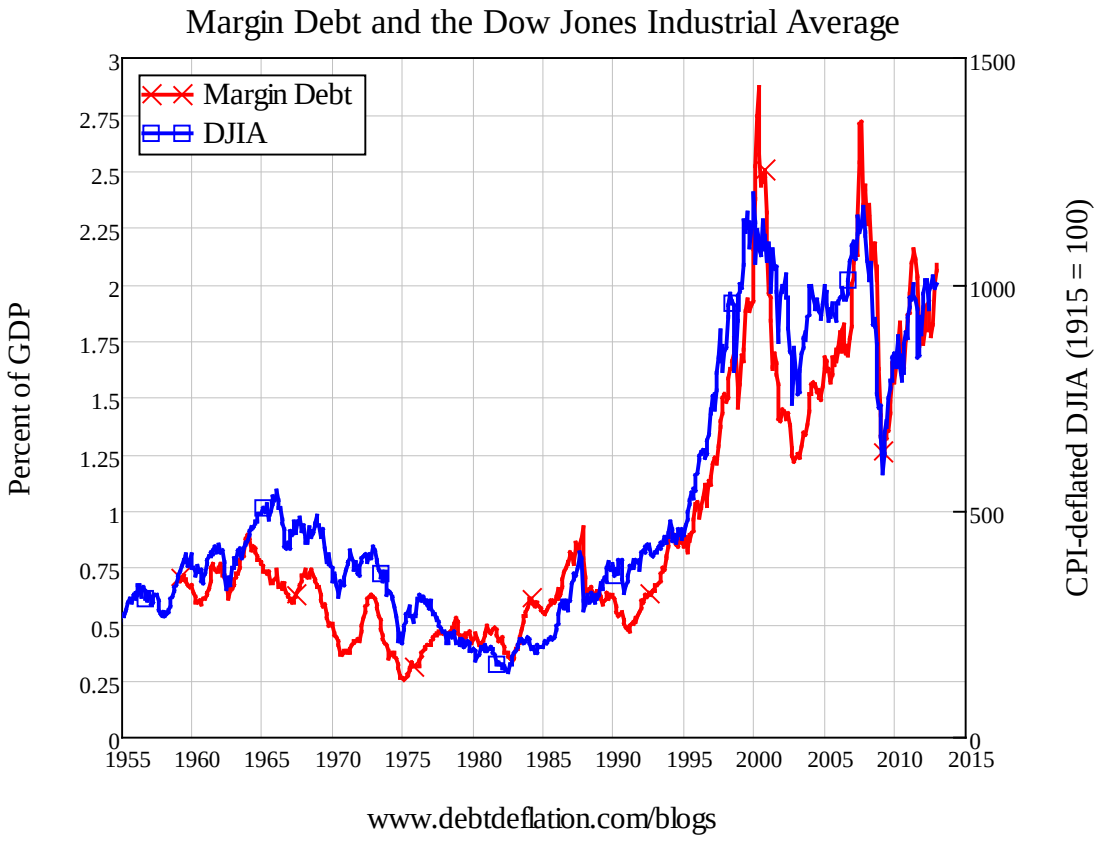


OK, I had my tongue in my cheek, but again this data had even me gob smacked when I first plotted it. I had *not* expected this correlation: my analysis actually runs from change in margin debt, rather than its level. So this outright match blew me away—particularly when I put the two series on the same chart (see Figure 4—and yes Alan, feel free to use this one on the ABC News!).

My causal argument commences from my definition of aggregate demand as being the sum of GDP plus the change in debt—a concept that at present only heretics like myself, Michael Hudson, Dirk Bezemer and Richard Werner assert, but which I hope will become mainstream one day. Matched to this is a redefinition of supply to include not only goods and services but also turnover on asset markets.

This implies a causal link between the rate of change of debt and the level of asset prices, and therefore between the acceleration of debt and the rate of change of asset prices—but not one between the level of debt and the level of asset prices. Nonetheless there is one in the US data, and it's a doozy: the correlation between the level of margin debt and the level of the Dow Jones is 0.945.

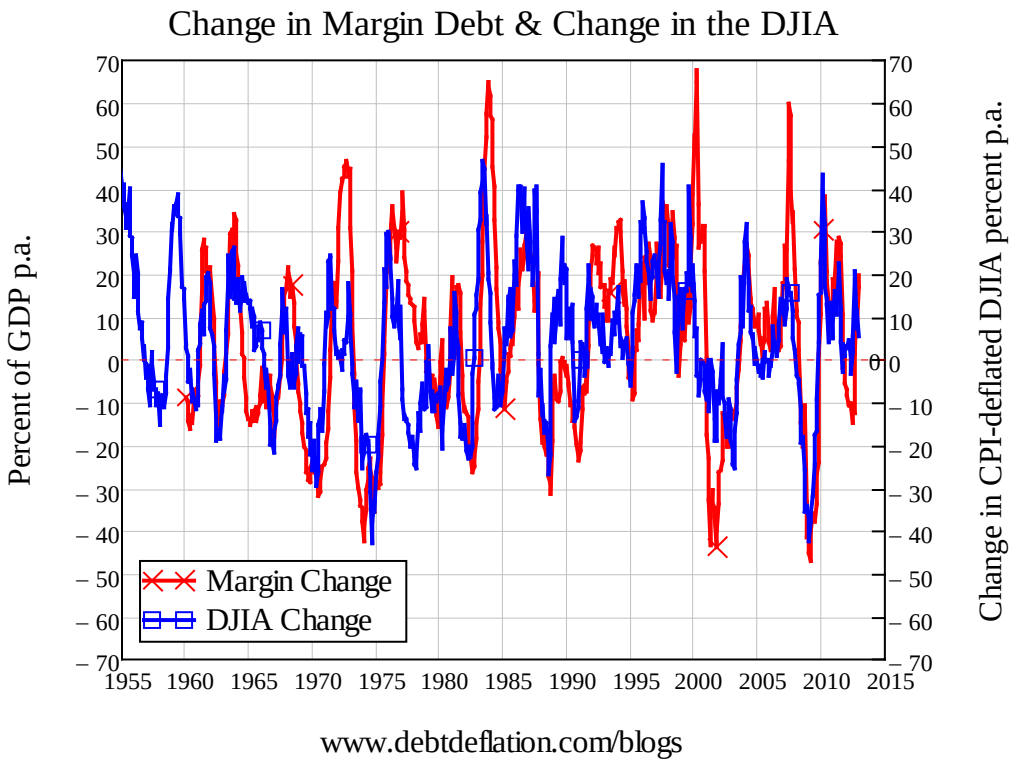
Figure 4: Margin debt compared to the DJIA—correlation 0.945



Of course there are elements of spurious correlation here: they were both generally rising over 1955-2013. But one can also make a causal argument that increasing levels of debt levered up the gap between asset and consumer prices. This assertion of course directly contradicts a famous proposition in academic finance—the "Modigliani-Miller theorem" that the level of debt has no impact on the level of asset prices—which is another good reason to take it seriously.

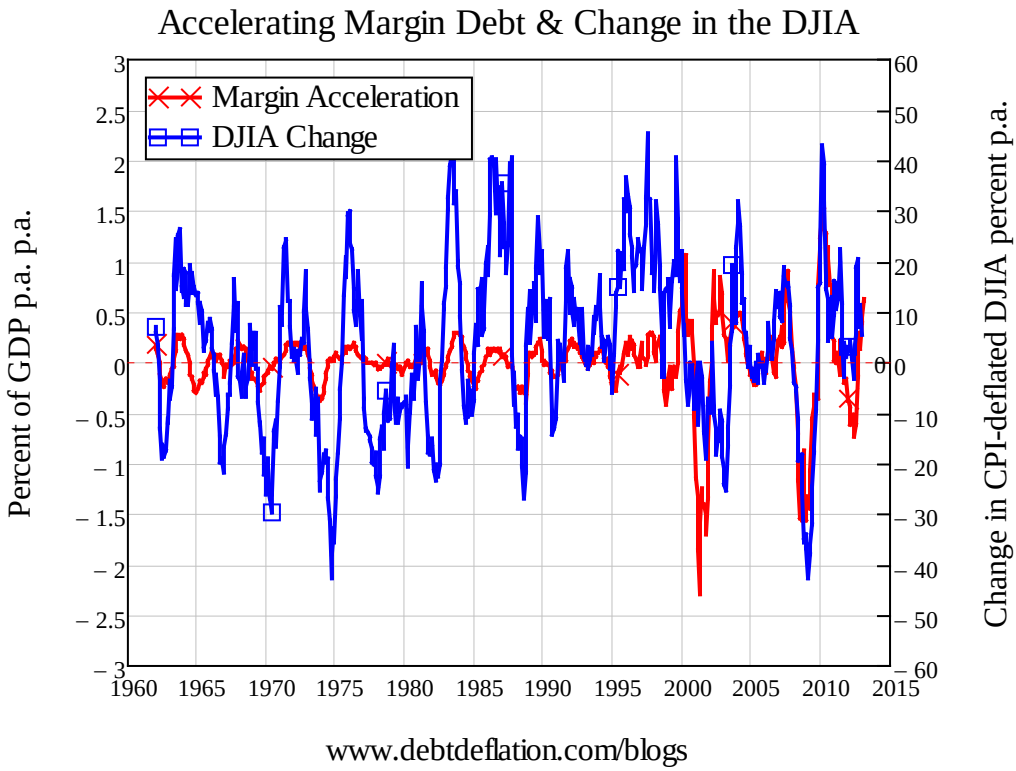
In devising my "aggregate demand is income plus change in debt; aggregate supply is goods and services plus net turnover on asset markets" relation, I was never sure whether the measure of asset market turnover should be based on the level of asset prices, or their rate of change: this was something that only empirical research could clarify. And on this point, the US data is again exceptional: both the rate of change of margin debt (relative to GDP) and the rate of acceleration of margin debt correlate strongly with change in the Dow over the past six decades.

Figure 5: Change in margin debt & change in the Dow--correlation 0.59



The correlation of the change in debt with change in the Dow is stronger than the correlation of acceleration—0.59 versus 0.4—but both are pretty strong for correlations over more than half a century, especially since conventional wisdom asserts they should both be zero.

Figure 6: Margin debt acceleration & change in the Dow--correlation 0.4



The correlations have risen too as the level of debt has risen—both aggregate private debt and, in the USA's case, margin debt which is specifically used to buy shares.

Figure 7: Change in margin debt & the Dow in recent years—correlation 0.69

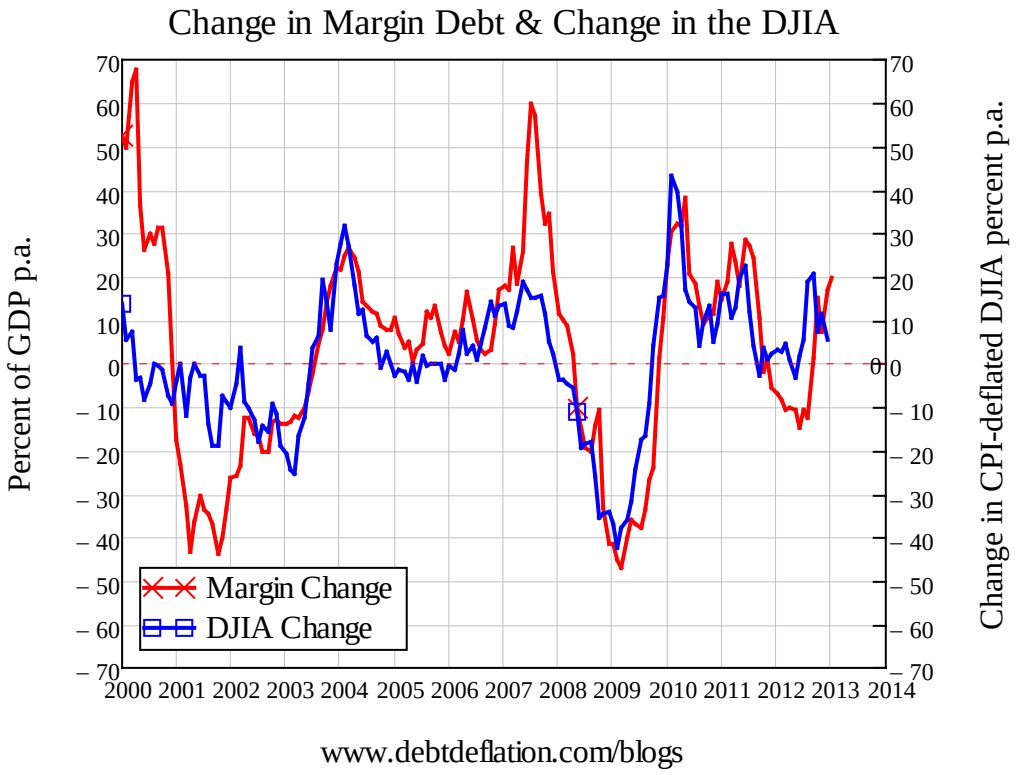
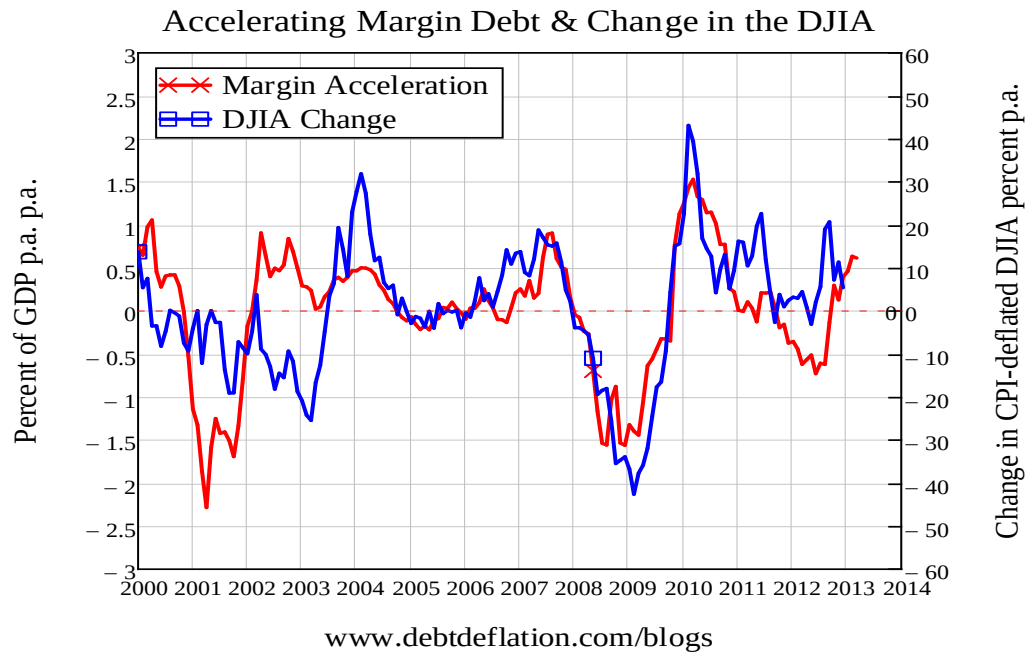


Figure 8: Margin debt acceleration & change in the Dow—correlation 0.6



Now comes the complex question: which causes which? Does rising/accelerating margin debt cause the stock market to rise, or does a rising stock market entice more people into margin debt? Obviously there will be some cumulative causation here: both statements are going to

be true to some degree. But this also implies a positive feedback loop, which is part of the explanation for why stock prices are so volatile.

Regardless of that complex causal loop, this data scotches Greenspan and his causal argument that a rising stock market causes a rising GDP. The market—and recently the economy—has risen not because of "the wealth effect", but because of "the leverage effect". Leverage has returned to the stock market, driving up stock prices and aggregate demand in the process.

How far can it go? Margin debt is still shy of its all-time high as a percentage of GDP, so there is certainly some headroom for further rises. But at the same time, the market is still in territory that was uncharted before the Loony Zeros (my "Roaring Twenties" candidate for how we should describe the last decade and a half) drove it higher than it has ever been before. Fragility, rather than sustainability is the message I would take from this data.

I'm reassured in this prognosis by the fact that Greenspan made precisely the opposite point in that interview, when he stated that "the price-earnings ratio is at a level at which it cannot basically go down very much." As some other commentators have observed, Greenspan expressing confidence in the stock market is a reliable contrary indicator.

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Are the bubbles back?

Dean Baker [Center for Economic and Policy Research, USA]

The stock market has come roaring back in the last three years, rising to levels close to 10 percent above pre-recession peaks. The housing market has also turned around, with nationwide house prices achieving double-digit increases year over year. Many markets have seen increases of more than 20 percent year over year.

This picture has led many people to ask whether we are seeing the return of the bubbles that drove the economy over the last two decades. I would encourage calm. Stock prices are somewhat high by historic standards, but hardly in bubble territory. Adjusted for inflation, nationwide house prices are above their mid-1990s levels, but still down by more than one-third from their bubble peaks. But there are some seriously disturbing signs in many local markets that warrant close attention.

The run-up in the stock market

The reversal in the stock market over the last three years has truly been extraordinary. The S&P 500 bottomed out at just over 680 in March of 2009. In June of 2013 it stood at more than 1615, an increase of more than 130 percent in little more than three years. While this sort of run-up is extraordinary, it is important to remember that it is starting from a very depressed base. Before the downturn, the S&P had peaked at 1560 in the fall of 2007. If we assume the economy has a potential growth rate of 4.5 percent (2.0 percent inflation and 2.5 percent real growth), then the S&P would have to be at almost 2000 in June of 2013, a 20 percent increase from the June level, to be as high relative to the size of potential GDP as it was in the fall of 2007. Unless we think that the market was in a very serious bubble in 2007, it could not plausibly be in a bubble at present.

Looking to 2000, when the market was certainly in a bubble, the S&P is at roughly the same level as it was more than 13 years ago. If we impute 13 years of 4.5 percent nominal growth to the S&P at its March 2000 peak, it would be at almost 2900 today, roughly 80 percent above its current level. There is clearly much room between current stock prices and the bubble levels of the late 1990s.

We can look at the market in slightly different way by taking the ratio of stock prices to corporate earnings. It is easiest and probably most useful to do this for the economy as whole, since that gives us the best data. The Federal Reserve Board reported the market value of the equity of domestic corporations as $21.5 trillion at the end of the first quarter of 2013.[1] The Commerce Department reported after-tax profits of U.S. corporations for calendar year 2012 as $1.5 trillion.[2] This translates into a price to earnings ratio of 14.3, right about the long-term average.

[1] Board of Governors of the Federal Reserve System, Financial Accounts of the United States Table L.213, Line 23, available at http://www.federalreserve.gov/releases/z1/Current/.
[2] Commerce Department, National Income and Product Accounts, Table 1.12, Line 15, available at http://www.bea.gov/iTable/iTable.cfm?ReqID=9&step=1#reqid=9&step=1&isuri=1.

Of course profits have been unusually high in this recovery as the weakness of the labor market has prevented workers from getting any share of the productivity growth that has taken place over the last five years. Presumably at some point the economy will strengthen somewhat and workers' bargaining power will increase. Of course this would imply more than trend growth so that the loss in profit share will be at least partly offset by a larger GDP.

The Congressional Budget Office estimates that the economy is 6 percent below potential GDP. This means that even if there were a sharp drop in the profit share of income, say 25 percent, associated with a return to potential GDP, profits would only fall by a bit more than 20 percent from their current levels. In the context of the price to earnings ratio, if the economy returned to trend GDP tomorrow and the profit share plunged by 25 percent, and market values did not budget, we would be looking at an economy-wide price to earnings ratio of 18.

That might be somewhat higher than the historic average, but would hardly qualify as bubble territory. No one has a good enough crystal ball to say what the proper price to earnings ratio for the stock market should be, but it seems a bit of stretch to say that a PE ratio that is 20-25 percent higher than the long period average is a bubble.

Housing: is the mania returning?

News reports were close to ecstatic over the double digit increases reported in various house price indices in May and June. While a bounce back from what were clearly depressed levels in many markets is good news, the overall picture is not necessarily one warranting celebration.

Taking the national data first, there is probably not too much to worry about in the most recent numbers. Using the Case-Shiller national inflation-adjusted house prices were about 17 percent higher in the first quarter of 2013 than they were in the first quarter of 1996, before the bubble had begun to boost prices. They are almost exactly the same as they were in the first quarter of 2000. By comparison, they are still down by more than 35 percent from the peaks reached in the summer of 2006. As with the stock market, crystal balls are not so accurate as to tell us exactly what house prices should be. But even if the 1996 values are closer to what fundamentals might dictate, it would be difficult to view an increase of 17 percent as a bubble, especially with mortgage interest rates at their lowest levels in more than 50 years.

While it may be possible to be sanguine about the national data, there are many local markets where there could be cause for concern. House prices in many local markets have been increasing in recent months at more than a 40 percent annual rate. These rapid rates of price increase are occurring in what had been the most beat-up markets during the crash. This list includes the bottom third of the market in both Las Vegas and Phoenix, as well as many of the cities in the central valley in California that were ground zero for the housing bubble.

According to accounts from realtors and in the business press, as well as data on the percentage of homes bought with mortgages, the run-up in house prices in these areas is being driven largely by investors. In some areas the majority of the homes are being purchased with cash rather than mortgages, which is usually a good sign that the purchaser is not an owner/occupant. There are also accounts of the same sorts of frenzies that were seen

in the bubble, with houses in some market routinely drawing multiple bids and buyers coming in with escalator clauses in their offers.

This sort of behavior should provide serious ground for concern about the course of prices in these markets. For the most part, these markets to date have just been recovering lost ground. For example house prices in the bottom third of the Phoenix market are just back to their 2003 level in nominal terms, implying that they are still more than 20 percent lower adjusted for inflation. In Las Vegas nominal prices for homes in the bottom third of the market are just back to their 2000 level. There would be a similar story for most of the central valley cities.

However, even if current price levels are not in any obvious way out of line with the fundamentals in the market, if prices rise very long at a 40-plus percent annual rate, they soon will be. For this reason it will be important to keep a focus on these markets.

It is worth noting that the risk is not to the health of the national economy, as was the case in the bubble years. Housing construction is recovering but is still well below normal levels. If prices were to again collapse in these markets it would not have enough of an impact on construction to be felt in the national data. Similarly, the impact of any wealth effect from this run-up would be too limited to affect national consumption data. And there is no reason to believe there is the same sort of house of cards financing that we saw with the explosion of subprime and Alt-A lending during the last decade.

If these bubbles burst the immediate losers will be the people speculating in these markets. This will include many hedge funds and private equity funds that have been buying up blocks of homes with the hope of renting them out for a period of time and then reselling them, or in some cases just fixing them up and reselling them. There are also many small-time speculators doing the same thing, just as was the case in the housing bubble years. When the music stops, these folks will all take a big hit. That will be bad news for them, but they should know the risks of this sort of investment.

The unfortunate part of this story would be ordinary homeowners who again buy into a bubble market, wrongly believing that housing is a safe investment and a sure way to build some sort of nest egg for the future. Just as tens of millions of people found themselves in homes that were worth less than what they paid in the last bubble, we may see hundreds of thousands of homeowners again ending up in this situation if we get a new bubble.

This would be a tragedy. We can't expect the average homeowner to approach the real estate market with the same savvy as a Wall Street investor. While we can't keep people from choosing to buy homes, hopefully they will not get the same push to buy into a bubble market as they got in the last decade, not just from the industry, but also from the government and non-profits promoting "asset-building". You don't build assets by paying 20 percent too much for a house.

Anyway, this is the biggest immediate risk that the economy faces from a housing bubble. It is not a nationwide story, but rather a number of limited markets with extraordinary rates of price increase. This does not rule out the possibility that the national market will maintain a double-digit increase for a long enough period of time that it too will be in bubble territory, but that does not seem to be an immediate concern.

There is one last point worth noting. The extraordinarily low interest rates of recent years undoubtedly provide some boost to house prices. Historically house prices in the United States have not been very sensitive to interest rates, but that may be changing somewhat going forward. Of course the implication of more interest sensitive house prices is that if interest rates rise in the next few years, as is almost universally expected, then house prices will fall.

That is likely to be less of an issue in the United States than in countries like Canada, Australia, and the United Kingdom, all of which have average house prices more than 50 percent higher than in the United States. It is likely that the extraordinary price levels in these countries are in large part the result of low interest rates. This fact is likely to pose a serious problem for these economies as the world economy recovers. Higher interest rates could send house prices in all three countries plummeting, which will certainly dampen their recoveries, if not actually throw them back into recession.

It may turn out to be the case that we are now in an era, at least in some countries, in which house prices will move more like bond prices in response to interest rates. In principle there is nothing wrong with this, but it is unlikely that many homeowners in these countries now recognize that they can expect to sell their home at a much lower price if interest rates rise. This education process could prove quite painful for tens of millions of homeowners.

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The next crisis

Ann Pettifor [Policy Research in Macroeconomics, UK]

> "You have a dog, and I have a cat. We agree that they are each worth a billion dollars. You sell me the dog for a billion, and I sell you the cat for a billion. Now we are no longer pet owners, but Icelandic banks, with a billion dollars in new assets." *The Emperor Has No Clothes,* David Lizoain, Social Europe Journal, 16 April, 2013.[1]

Is there going to be another crisis? Of course there is. The liberalised global financial system remains intact and unregulated, if a little battered. "The crisis has proved itself as a way to solidify the existing economic order" – as Professor Joseph Vogl noted in his paper (Sovereignty effects) to the 2012 INET Conference in Berlin.

Neoliberal economic policies still prevail in all western Treasuries and in major university economics departments, informed by Samuelson's barter-based theory of money and credit:

> "Even in the most advanced industrial economies, if we strip exchange down to its barest essentials and peel off *the obscuring layer of money,* we find that trade between individuals or nations largely boils down to barter (my emphasis)."[2]

With money and money-creation helpfully obscured, and regulation trained on meaningless capital adequacy targets, business-is-better-than-usual for credit-creating commercial bankers, even while their balance sheets effectively remain under water. Central banks provide liquidity for speculation; taxpayers guarantee their risk-taking, and in a strange reversal of the purpose of banking, bankers no longer lend into the economy. Instead depositors and savers lend to bankers – expecting no return. In the meantime the discipline of the invisible hand is relegated to ancient textbooks.

Central banks, by their own admission, have used money market operations – "easy, cheap money" – to "buy time" and inflate asset bubbles, enriching the asset-rich, while austerity has impoverished the wage- and income-dependent.

Western politicians remain obeisant to Big Money, and on behalf of finance capital ruthlessly extract fictitious wealth created during the credit boom from their citizens, using austerity and "re-balancing" as the cover.

Finance capital reigns supreme in political centres of power. The revolving door between the world's biggest banks – Goldman Sachs, JP Morgan Chase and Citigroup – and finance ministries, central banks and political institutions – keeps revolving and by that means maintains the status quo.

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[1] See http://www.social-europe.eu/2013/04/the-emperor-has-no-clothes/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+social-europe%2FwmyH+%28Social+Europe+Journal%29

[2] P. Samuelson, 1973, Economics, 9th Ed., New York: McGraw-Hill, quoted in G. INgham, *The Nature of Money*, Polity Press, 2004.

The most egregious recent example is that of Mario Draghi, now governor of the European Central Bank, but in the 1990s director-general of the Italian Treasury. There, according to an investigation by the *Financial Times*[3], he worked with private investment banks to arrange derivative contracts designed to disguise the scale of Italy's debt from EU authorities - to ease Italy's entry into the Eurozone. Draghi moved from the Italian Treasury to Goldman Sachs in 2002 - 2005, and from there it was one easy step to the governorship of the Bank of Italy in 2006. There he supervised and allowed Banca Monte dei Paschi di Siena SpA to mask losses 367 million-euros, which later required a taxpayer-funded bailout.[4] This experience qualified him for the role of governor of the European Central Bank in 2011.

Back in 2006 I wrote a modest little book which the publisher insisted on entitling "*The coming first world debt crisis*" – a title I believed would be out of date by the time of publication in September that year. I was wrong. The world's vast credit bubble had another year to expand before the "debtonation" of 9th August, 2007, when inter-bank lending froze. Even then the public remained ignorant of the full extent of the crisis until the bankruptcy of Lehman's bank in September, 2008.

I was wrong about another thing: that the "debtonation" would lead to a bursting of the global credit bubble; to a sustained period of global bank bankruptcies, debt write-offs and de-leveraging. Not so. Some big banks failed, many small US banks failed; but the overwhelming majority are still upright, thanks to extraordinary support and '"accommodation" by taxpayer-backed central banks. While 11.2 million American property owners have been foreclosed upon, and the US appears to be the only western economy to have begun the process of reducing the ratio of debt to GDP by 14%, debt-deleveraging – according to McKinsey and Co – has barely begun in the ten largest developed economies.[5]

[3] *Financial Times* June 26, 2013. Italy faces restructured derivatives hit
By Guy Dinmore in Rome.
http://www.ft.com/cms/s/0/440007a8-dd9a-11e2-a756-00144feab7de.html#axzz2XK1eXV3H

[4] *Draghi Bank of Italy Knew of Monte Paschi Missteps in '10* By Elisa Martinuzzi, Sonia Sirletti & Lorenzo Totaro - Jan 30, 2013. http://www.bloomberg.com/news/2013-01-30/draghi-s-bank-of-italy-knew-of-monte-paschi-missteps-in-2010.html

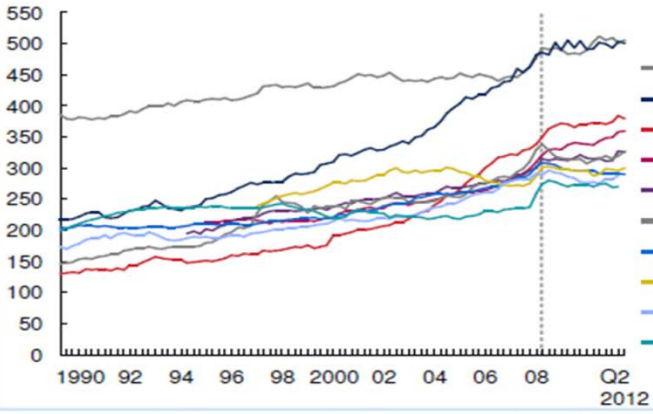
[5] Debt and Deleveraging: Uneven progress on the path to growth. January, 2012.
http://www.mckinsey.com/insights/global_capital_markets/uneven_progress_on_the_path_to_growth

Deleveraging has only just begun in the ten largest developed economies

▲ Significant increase in leverage[2]
▼ Deleveraging

Total debt,[1] 1990–2012Q2

% of GDP



	Change, Percentage points 2000–08	2008–Q2 2012[3]
Japan	46	28 ▲
United Kingdom	172	18
Spain	146	41 ▲
France	89	49 ▲
Italy	62	27 ▲
South Korea	92	-2 ▼
United States	81	-12 ▼
Germany	12	12
Australia	77	-4 ▼
Canada	39	11

1 Includes all loans and fixed-income securities of households, corporations, financial institutions, and government.
2 Defined as an increase of 25 percentage points or more.
3 For the US, data is available up to 2012Q3

SOURCE: Haver Analytics; national central banks; McKinsey Global Institute

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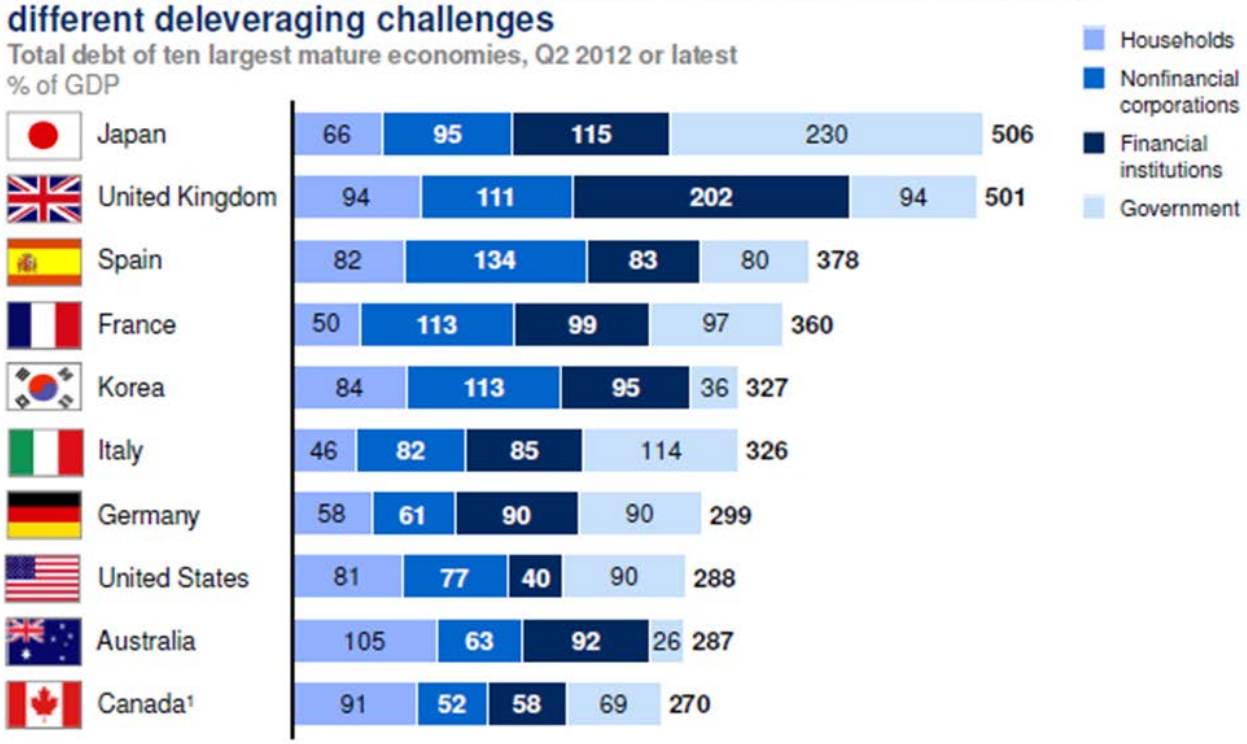
The composition of debt varies widely across countries, indicating different deleveraging challenges

Total debt of ten largest mature economies, Q2 2012 or latest
% of GDP



1 According to Canada's national accounts, "household" sector includes nonfinancial, non-corporate business.
NOTE: Numbers may not sum due to rounding.

SOURCE: Haver Analytics; national central banks; McKinsey Global Institute

McKinsey & Company | 7

Banks, firms and households in western economies are still burdened by debts that will never be repaid. Much of that debt is phantom wealth, created out of thin air during the boom years. Behind the smokescreen of 'austerity' governments are colluding with finance capital to confiscate that wealth, and use it to shore up the private banking sector: "converting fictitious claims into more tangible gains" to quote David Lizoian.[6] Bankers (and their friends in political and regulatory institutions) lie about their balance sheets, fleece taxpayers, laugh about taking taxpayers to the cleaners (see the scandal of the Allied Irish Bank tapes) and simply 'extend and pretend' that assets on their balance sheets will be repaid. Furthermore, globalised banks have not been re-structured, thanks to effective lobbying of spineless politicians. They remain far too interconnected and will therefore once again transmit failure across the globe at the speed of lightning.

The question therefore becomes one of timing: when will the next crash happen? To that I offer the tentative answer: it may be imminent.

The Federal Reserve's recent, sudden change of direction has rattled bond markets and caused yields to rise. Only yesterday it seems, the Fed was offering long-term calendar guidance (through to 2015) on the direction of interest rates. Now that guidance, and date, has been dropped in favour of new, less predictable economic data: the 6.5% unemployment threshold.

The Fed it seems is (rightly) worried about deflation which in the words of Governor Bernanke "raises real interest rates… (and) means that debt deleveraging takes place more slowly". Furthermore, it seems the Fed is beginning to regret that its punchbowl of QE I, II and III, has so enriched the already-rich including speculators and those engaged in the carry trade ("big money does organise itself somewhat like feral hogs"[7] said the President of the Dallas Federal Reserve recently) – while having little impact on unemployment, which remains stubbornly high. This led Chairman Bernanke to comment to Congress on 22 May, 2013 that:

> "High rates of unemployment and underemployment are extraordinarily costly: Not only do they impose hardships on the affected individuals and their families, they also damage the productive potential of the economy as a whole by eroding workers' skills and – particularly relevant during this commencement season – by preventing many young people from gaining workplace skills and experience in the first place. The loss of output and earnings associated with high unemployment also reduces government revenues and increases spending on income-support programs, thereby leading to larger budget deficits and higher levels of public debt than would otherwise occur." [8]

We (Professor Victoria Chick and myself) argued as much back in 2010, when we published data from 100 years of national accounts in "*The Economic Consequences of Mr Osborne*" –

[6] The Emperor Has No Clothes, David Lizoain, Social Europe Journal, 16 April, 2013. http://www.social-europe.eu/2013/04/the-emperor-has-no-clothes/

[7] June 24, 2013. *Fed fights back against 'feral hogs'.* By Claire Jones and Robin Wigglesworth in London and James Politi in Washington http://www.ft.com/cms/s/0/9d8fa63e-dce6-11e2-b52b-00144feab7de.html#axzz2XK1eXV3H

[8] Chairman Ben S. Bernanke, *The Economic Outlook. Before* the Joint Economic Committee, U.S. Congress, Washington, D.C. May 22, 2013
http://www.federalreserve.gov/newsevents/testimony/bernanke20130522a.htm

and showed that in a slump "fiscal consolidation does not 'slash' the debt, but contributes to it". [9]

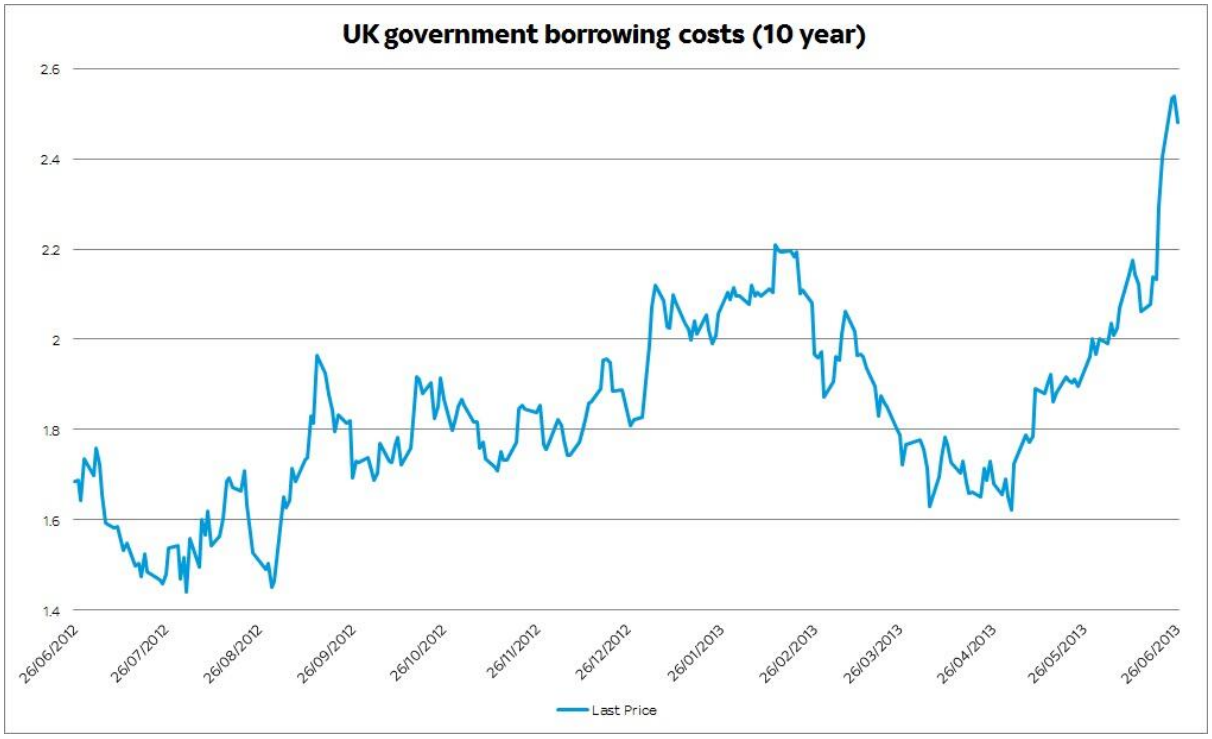
Federal Reserve 'Monetary activism' has hit the brick wall of Congressional "fiscal conservatism". Cuts in public spending in the US are expected to take out 1.0 – 1.5% GDP growth in 2013, Bernanke said. In the face of these "fiscal headwinds" Mr Bernanke has thrown in the towel:

> "In present circumstances" he said, "with short-term interest rates already close to zero, monetary policy does not have the capacity to fully offset an economic headwind of this magnitude." [10]

Markets have taken fright at the Fed's new emphasis on the unemployment threshold, and bond yields have risen. US Treasury Bond prices fell on 19 June, and the benchmark ten-year yield rose to its (current) 2.51%.

The following day the UK Gilt market, which has been falling since May, also fell, leading to major losses for bond investors, when the ten-year government bond yield rose to current 2.5%. These falls are already placing upward pressure on UK fixed-rate mortgages, and will ultimately pile pressure on indebted Britons whose incomes are falling in real terms.

And rising yields will increase UK government borrowing costs.



Courtesy Ed Conway (@EdConwaySky) of Sky News. Via twitter.

[9] PRIME: *The Economic Consequences of Mr. Osborne* by Professor Victoria Chick and Ann Pettifor. First published in July, 2010. http://www.primeeconomics.org/?page_id=51

[10] Chairman Ben S. Bernanke, *The Economic Outlook.* Before the Joint Economic Committee, U.S. Congress, Washington, D.C. May 22, 2013
http://www.federalreserve.gov/newsevents/testimony/bernanke20130522a.htm

To add to its debt burden, the UK Debt Management Office unwisely sold its £5 billion Gilt on 25 June, 2013 – a day of bond price volatility – at a rate committing the UK taxpayer to paying 3.65% for the next 55 years.

So debt burdens remain high, and interest rates look to be tightening, just as central bankers become impatient at the failure of politicians and bankers to make structural fixes. The question then becomes: when do spikes in interest rates become daggers aimed at bursting today's huge government bond/debt bubble?

Soon, in my humble opinion.

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http://www.paecon.net/PAEReview/issue64/Pettifor64.pdf

From the bubble economy to debt deflation and privatization

Michael Hudson [University of Missouri at Kansas City, USA]

The Federal Reserve's QE3 has flooded the stock and bond markets with low-interest liquidity. This makes it profitable for speculators to borrow cheap and make arbitrage gains buying stocks and bonds yielding higher dividends or interest. In principle, one could borrow at 0.15 percent (one sixth of one percent) and buy up stocks, bonds and real estate throughout the world, collecting the yield differential as arbitrage. Nearly all the $800 billion of QE2 went abroad, mainly to the BRICS for high-yielding bonds (headed by Brazil's 11% and Australia's 5+%), with the currency inflow for this carry trade providing a foreign-exchange bonus as well.

This financial engineering is not your typical bubble. The key to the post-2000 bubble was real estate. It is true that the past year and a half has seen some recovery in property prices for residential and commercial property. But something remarkable has occurred. So in this new debt-strapped low-interest environment, hedge funds and buyout funds are doing something that has not been seen in nearly a century: They are buying up property for all cash, starting with the inventory of foreclosed properties that banks are selling off at distress prices.

Ever since World War II, the operating principle of real estate investors is never to use their own money – or at least, to use as little of their own as possible. Debt leveraging leaves the rental income paid to the banks as interest. The absentee owner is after the capital gain at the end of the bubble's rainbow. That is what a bubble economy is all about. But the only way that investors can obtain current returns above today's miniscule rates is to buy assets directly for cash.

In a bubble economy, falling interest rates (e.g., from 1980 to today) almost guarantee capital gains. But today's near-zero interest rates cannot fall any further. They can only rise, threatening capital losses. That is what is panicking today's bond and stock markets as the Fed talks about ending QE3's near-zero interest rate regime. So there is little incentive for bond buying. Once interest rates rise, we are in an "anti-bubble" economy. Instead of capital gains driving "wealth creation" Alan Greenspan style, we have asset-price deflation.

In the Bubble Economy, families became convinced that the way to build up their wealth was to borrow as much as they could to buy the most expensive home they could, and ride the wave of asset-price inflation. But since 2008, consumers have paid *down* about $5 trillion of personal debt. This has meant using their wages and other income to pay down mortgages, student debt, auto debt, credit-card debt and other bank loans. This leaves only about a quarter of the typical family's paychecks to spend on goods and services after paying the Finance, Insurance and Real Estate (FIRE) sector and the taxes shifted onto wage earners and consumers. The outlook looks dim for corporate sales and hence earnings. So instead of debt-leveraged inflation of asset prices, we have *debt deflation* of the overall economy.

To put this in perspective, from 1945 until interest rates rose to their peak in 1980, there was an almost steady 35-year downturn in bond prices. The Bubble Economy was fueled by interest rates being rolled back down to their 1945 levels and even lower. Credit flowed into

the financial markets to buy stocks, peaking in the dot.com bubble in 2000, and then to inflate the 2001-2008 real estate bubble.

So we are now in is the Bubble Economy's *legacy.* We can think of this as Phase 2: repayment time, along with foreclosure time. That is what happens in debt deflation. The Obama Administration has broken its 2008 campaign promises to Congress and to voters to write down mortgage debt to the ability to pay or to market prices reflecting realistic rental values. The debt legacy has been kept in place, not written down.

Carrying this debt overhead has caused a fiscal crisis. The financial and real estate bubble helped keep state and local finances solvent by providing capital gains taxes. These are now gone – and properties in default or foreclosure are not paying taxes. And whereas public pension funds assumed an 8+% rate of return, they now are making less than 1%. This has left pensions underfunded, and prompted some municipalities to engage in desperate gambles on derivatives. But the Wall Street casino always wins, and most cities have lost heavily to the investment banking sharpies advising them.

In place of a new bubble, financial elites are demanding privatization sell-offs from debt-strapped governments. Pressure is being brought to bear on Detroit to sell off its most valuable paintings and statues from its art museums. The idea is to sell their artworks for tycoons to buy as trophies, with the money being used to pay bondholders.

The same dynamic is occurring in Europe. The European Union and European Central Bank are demanding that Greece sell off its prime tourist land, ports, transport systems and other assets in the public domain – perhaps even the Parthenon. So we are seeing a neo-*rentier* grab for basic infrastructure as part of the overall asset stripping.

This is a different kind of inflation than one finds from strictly financial bubbles. It is creating a new neo-feudal *rentier* class eager to buy roads to turn into toll roads, to buy parking-meter rights (as in Chicago's notorious deal), to buy prisons, schools and other basic infrastructure. The aim is to build financial charges and tollbooth rents into the prices charged for access to these essential, hitherto public services. Prices are rising not because costs and wages are rising, but because of monopoly rents and other rent-extraction activities.

This post-bubble environment of debt-strapped austerity is empowering the financial sector to become an oligarchy much like landlords in the 19th century. It is making its gains not by lending money – as the economy is now "loaned up" – but by direct ownership and charging economic rent. So we are in the "economic collapse" stage of the financialized bubble economy. Coping with this legacy and financial power grab will be the great political fight for the remainder of the 21st century.

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Rethinking economics using complexity theory

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Abstract
In this paper we argue that if we want to find a more satisfactory approach to tackling the major socio-economic problems we are facing, we need to thoroughly rethink the basic assumptions of macroeconomics and financial theory. Making minor modifications to the standard models to remove "imperfections" is not enough, the whole framework needs to be revisited.[1] Let us here enumerate some of the standard assumptions and postulates of economic theory.

1. An economy is an equilibrium system. In other words, it is a system in which all markets systematically clear at each point of time, but where the equilibrium may be perturbed, from time to time by exogenous shocks.
2. Selfish or greedy behaviour of individuals yields a result that is beneficial to society – a modern, widespread, but inaccurate reformulation of the principle of the "invisible hand".
3. Individuals and companies decide rationally. By this it is meant that individuals optimize under the constraints they are facing and that their choices satisfy some standard consistency axioms.
4. The behaviour of all the agents together can be treated as corresponding to that of an average or representative individual.
5. When the financial sector is analysed, it is assumed that financial markets are efficient. Efficiency here means that all the relevant information concerning an asset is reflected in the price of that asset.
6. For financial markets it is assumed that they function better if their liquidity is greater.
7. In financial markets, the more connected the network of individuals and institutions the more it reduces risks and the more stable and robust is the system.

Below, we discuss the fundamental problems with these assumptions and outline some of the policy implications of improved assumptions.

At a recent meeting at the OECD, the question arose as to whether the economy is currently just experiencing one of its recurrent shocks or whether it is experiencing a "phase change" ("systemic shift"). If the latter is correct, the discipline of economics may well need to undergo a paradigm change.[2] (See Section 1.2).

[1] David Colander, Michael Goldberg, Armin Haas, Katarina Juselius, Alan Kirman, Thomas Lux and Brigitte Sloth, The Financial Crisis and the Systemic Failure of the Economics Profession, Critical Review, Volume 21, Issue 2-3, 2009, Pages 249-267; Alan Kirman, The Economic Crisis is a Crisis for Economic Theory, CESifo Economic Studies (2010) 56 (4): 498-535; Andrew G. Haldane and Robert M. May, Systemic risk in banking ecosystems, Nature 469, 351-355 (2011); Paul Krugman, How Did Economists Get It So Wrong?, The New York Times Magazine (September 2, 2009); Thomas Lux and Frank Westerhoff, Economics crisis, Nature Physics 5, 2-3 (2009); W. Brian Arthur, Complexity economics: A different framework for economic though, to appear in Complexity Economics, Oxford University Press (2013); Neil Johnson and Thomas Lux, Financial systems: Ecology and economics, Nature 469, 302-303 (2011); Paul Ormerod and Dirk Helbing, Back to the drawing board for macroeconomics, in What is the Use of Economics?, edited by Diane Coyle (September 2012); see also the video recording of the talk "Rethinking macro-economics based on complexity theory" at the Latsis Symposium 2012: "Economics on the Move",
http://www.multimedia.ethz.ch/conferences/2012/latsis/04_wednesday?doi=10.3930/ETHZ/AV-de04e25c-2106-45f2-a4ba-3d0e8e1ebeda&autostart=false

[2] Note that the paradigm shift from a geocentric to a heliocentric worldview facilitated modern physics, including the ability to launch satellites. In the same way should a paradigm shift from a component-oriented to an interaction-oriented, systemic perspective (as promoted by complexity science) enable us to find new solutions to urgent societal problems.

Whilst earthquakes, floods and famines produce dramatic losses, it can be argued that the social and economic losses due to the current financial, economic and political crisis are even more severe. Millions of people now see that, what they considered to be a safe future, is endangered by lost savings and pensions and disruption of their normal lives. Besides this, crime, violence and political extremism may increase as well. In the worst-case scenario, further developments could seriously diminish our quality of life, our social capital (particularly trust and cooperativeness), and even our cultural values and achievements. The developments in the past 5 years have made it possible that single countries or even the European Union could become unstable over time, not only economically, but also socially. This worrying development calls for new recipes and concerted actions, and also for contingency plans. It is time to explore new ways of managing our economy, oriented at sustainability and resilience rather than only at the often destructive pursuit of competition, efficiency, and growth.

It is tempting in situations such as the current one to find scape-goats and to lay the blame at their door. But this is misguided. As Voltaire remarked:

> "In an avalanche no single snowflake feels itself responsible".

… nor should it. Because what we have observed is a *systemic crisis* in which the participants were acting in accord with the incentives given to them by the system without realizing the global consequences of their acts.

This becomes particularly clear in a letter of the British Academy to Her Majesty The Queen, dated 22 July 2009:[3]

> "MADAM,
>
> When Your Majesty visited the London School of Economics last November, you quite rightly asked: why had nobody noticed that the credit crunch was on its way? **…** So where was the problem? Everyone seemed to be doing their own job properly on its own merit. And according to standard measures of success, they were often doing it well. The failure was to see how collectively this added up to a series of interconnected imbalances over which no single authority had jurisdiction. This, combined with the psychology of herding and the mantra of financial and policy gurus, lead to a dangerous recipe. Individual risks may rightly have been viewed as small, but the risk to the system as a whole was vast."

This strongly contrasts with the widely propagated paradigm of the "invisible hand", which has been commonly (mis)interpreted as "greed (or maximizing personal benefits) is good and will maximize social welfare". In contrast, however, as the participants in the economy pursued their goals, their complicated interaction and the consequences of their acts led the system to self-organize into a critical state. Such an evolution is not envisaged in standard economic models, and this is what motivated Jean-Claude Trichet, the ex-president of the European Central Bank to make the following statement:[4]

> "When the crisis came, the serious limitation of existing economic and financial models immediately became apparent. Arbitrage broke down... markets froze... market participants were gripped by panic. Macro models failed to predict the crisis and... [to explain] what was happening... ."

[3] See the letter from the British Academy at http://www.britac.ac.uk/templates/asset-relay.cfm?frmAssetFileID=8285

[4] Speech of Jean-Claude Trichet, President of the European Central Bank, on November 18, 2010

> "[In] the face of crisis, we felt abandoned by conventional tools. ...The key lesson... is the danger of relying on a single tool, methodology or paradigm. The atomistic, optimising agents underlying existing models do not capture behavior during a crisis period. Agent-based modelling... allows for more complex interactions between agents. ...we need to better integrate the crucial role played by the financial system into our macroscopic models."
>
> "I would very much welcome inspiration from other disciplines: physics, engineering, psychology, biology. Bringing experts from these fields together with economists and central bankers is potentially very... valuable."
>
> "A large number of aspects of the observed behaviour of financial markets is hard to reconcile with the efficient market hypothesis... But a determinedly empirical approach – which places a premium on inductive reasoning based on the data, rather than deductive reasoning grounded in abstract premises or assumptions – lies at the heart of these methods... simulations will play a helpful role."

In response to this call to arms, we argue that we have to develop a new economic thinking based on complex systems science and find new ways to overcome (or mitigate) our current problems.

Before proceeding we should emphasise that there is a very basic reason why many economists were quite surprised by the onset of the crisis and had difficulties to make successful proposals to overcome it in an efficient way. In recent years, as the discipline of economics developed further, most of the effort to explain empirical facts was devoted to modifying the existing theories in various, but relatively minor ways. However, little consideration was given to the structural changes that might have emerged as the economy evolved. For example, the idea that the economic system could, and maybe should, develop towards a system which is more democratically and less selfishly oriented is one that has received little attention simply because the concept of participatory decentralised organisation has been regarded as incompatible with efficient economic outcomes. Yet, the economy in which the thinking in terms of competition, free markets, homogenisation and global control developed has, in reality, evolved into a very different system.

Indeed, we argue that the increasing degree of complexity of our economic system is not in conflict with decentralisation, but will promote a tendency towards it, which is already visible in the way the internet is organized, the way smart grids are now being organized, and the way modern traffic systems will be managed. Furthermore, decentralisation will be promoted by technologies enabling bottom-up participation of consumers in production processes. Participatory platforms and social media of all kinds, but also 3D printers, are such technologies. They will enable local production and remove the old separation between consumers and producers, such that a new class of "prosumers" (co-producing consumers) will emerge. We believe that all this will pave the way for a new organization of economic systems – a participatory, diverse, bottom-up kind of economy, which we propose to call the "democratic economy" or "participatory market society". The emerging digital economy is the best indication of this, and the advent of the age of Big Data will fuel it even more. In fact, some envision "Big Data" to be the "Oil of the 21st Century".

Many would argue that standard economic theory enabled us to analyse and understand the

economy as it used to be, with long stable periods punctuated only by occasional crises. However, the recent evolution of the global economy should drive us to pursue ways of expanding economic theory such that it encompasses the new structures and organization emerging as we globalize and network our world. But let us first ask: what are the empirical characteristics of modern economies that pose problems for modern economic theory?

1. Are our present financial and economic systems in a stable equilibrium?

A fundamental assumption of many economic models is that the system is in equilibrium and will only be disturbed by exogenous shocks, e.g. due to innovations. Note that this is an assumption and not a conclusion. If one tried to endogenize innovations into economic models, it would become clear that they are, by their very nature, examples of systemic instabilities, which are fundamentally incompatible with a system in equilibrium. Therefore, it is important to discuss what are the implications of and evidence for economic systems that are not in equilibrium.

We say that a system behaves in an *unstable* way, if a small perturbation can drive it further and further away from its previous or "normal" ("equilibrium") state. This is, for example, the case if the system exhibits a breakdown or another systemic shift, if a quantity continues to grow, if the distribution of a quantity keeps changing over time, or if chaotic dynamics or cascade effects occur. Any of these characteristics indicate that the corresponding systems are *not* in an equilibrium or stable state. So, how do our financial and economic systems behave in reality?

1.1. Can we rely on the equilibrium paradigm of economics?

As we have said, current economic thinking is based on the assumption that the economic system is in equilibrium or at least, if disturbed, has a tendency to move back to a state of equilibrium. This idea was originally inspired by 19th century physics, specifically the fields of classical mechanics and thermodynamics.[5] However, it does not fit the framework of modern physics, particularly statistical non-equilibrium physics, and the theory of complex systems.

According to the equilibrium paradigm, there are optimal (or efficient) states of an economy, to one of which the system would automatically and quickly evolve, driven by "market forces". This idea is thought to be enshrined in the parable of the 'invisible hand', according to which social welfare is improved in an economic system, when everybody acts in his or her own best interest. However, Adam Smith, who is often seen as the originator and propagator of the paradigm of the invisible hand,[6] was much less dogmatic than his heirs. He argued that, while his vision of individuals as selfishly pursuing their own interests captured some grain of truth, social considerations were also important for everybody's behaviour. To cite him:[7]

> "How ever selfish man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it. Of this kind is pity or compassion, the emotion which we feel for the misery of others, when we either see it, or are made to conceive it in a very lively manner. That we

[5] Later Samuelson, in particular, used the analogy with thermodynamics.
[6] The idea that individual selfish optimization would create a social optimum seems to actually originate from a poem of Bernard Mandeville entitled "The Grumbling Hive" (1705). It was re-edited in 1714 under the title "The Fable of the Bees", which spread the idea and made it famous.
[7] Adam Smith (1759) *The Theory of Moral Sentiments.*

> often derive sorrow from the sorrow of others, is a matter of fact too obvious to require any instances to prove it; for this sentiment, like all the other original passions of human nature, is by no means confined to the virtuous and humane, though they perhaps may feel it with the most exquisite sensibility. The greatest ruffian, the most hardened violator of the laws of society, is not altogether without."

Not only did Smith see man as much less self-interested than the vision usually attributed to him, but he also saw a role for government intervention and control. Nevertheless, the widespread and over-simplified (or even wrong) interpretation of the 300-years-old idea has been used to justify a much more radical position, namely that government regulation automatically makes markets *less* efficient and *reduces* societal well-being. This vision is the main justification of the continued calls for free and unregulated markets.

We will return to the principle of the invisible hand in Section 2.5. At this point, we simply want to stress that it is hard to believe that current economic systems are systematically in equilibrium, considering that the conditions of today's global markets tend to change more quickly than the time that would be necessary to converge to an equilibrium. This time is determined, in part, by the time companies need to adapt to new market conditions, changing investment opportunities, and fluctuating demand for their products. It is important to recognize that, under conditions of delayed adaptation, unstable, non-equilibrium system behaviour may result even if each system component displays a stable dynamics.[8]

Furthermore, sustained high unemployment rates do not seem to be consistent with the clearing of labour markets that should happen in equilibrium. The volatility of financial markets and their loose coupling with the real economy also casts doubts on the notion of an economy in perpetual equilibrium. Particularly the phenomenon of excess volatility has stirred some debate about over-reactions of markets.[9] Furthermore, the occurrence of flash crashes[10] in financial markets cannot be reconciled with an equilibrium picture.

Finally, an important argument systematically raised by Mandelbrot[11] is the existence of power law statistics in financial markets. Such power laws are usually features of critical phenomena, i.e. phase transitions or self-organized criticality, which are both related to cascade effects and fundamentally incompatible with equilibrium concepts (Helbing[12] 2013).

1.2. Are economic systems instead complex dynamical systems?

A more natural picture of our economic system rather seems to be that of a complex dynamical system with many non-linearly interacting components (where non-linearity implies

[8] D. Helbing and S. Lämmer (2005) Supply and production networks: From the bullwhip effect to business cycles. Page 33-66 in: D. Armbruster, A. S. Mikhailov, and K. Kaneko (eds.) *Networks of Interacting Machines: Production Organization in Complex Industrial Systems and Biological Cells* (World Scientific, Singapore).
[9] D. Helbing, Dynamic decision behavior and optimal guidance through information services: Models and experiments, in M. Schreckenber and R. Selten (eds.) Human Behaviour and Traffic Networks (Springer, Berlin, 2004), pp. 47-95.
[10] The most well-known example of a flash crash occurred on May 6, 2010, where the Dow Jones dropped by about 1000 points within minutes, before it more or less recovered again, but flash crashes have happened repeatedly, see http://en.wikipedia.org/wiki/2010_Flash_Crash
[11] See e.g. Mandelbrot, B., Sur certains prix spéculatifs: faits empiriques et modèles basés sur les processus stables additifs non Gaussiens de Paul Lévy. Comptes-Rendus à l'Académie des Sciences, Séance du 4 Juin 1962, 3968–3970.
[12] D. Helbing, Globally networked risks and how to respond. *Nature* **497**, 51-59 (2013).

that causes and effects are not proportional to each other). The components in this case are the market participants: companies, banks, consumers, and other players such as regulatory institutions.

Typical properties of such complex dynamical systems are:[13]

- The system may spend long periods of time far from equilibrium, even when an equilibrium in principle exists.
- The system may have multiple equilibria.
- The equilibria may be unstable.
- The system cannot be strictly optimized in real-time, even with the biggest supercomputers.
- Feedback and unexpected side effects are common.
- The system exhibits self-organized dynamics.
- The system may have emergent properties, i.e. properties that cannot be understood from the properties of the system components, but rather from the interactions between them.
- The system behaviour is often counter-intuitive.
- It may be probabilistic and hard to predict (not just due to randomness).
- The system may feature cascade effects and extreme events. The probability of extreme events is higher than expected according to a normal (Gaussian) distribution, and their impact may have almost any size (in particularly it may be global in scale).
- The system behaviour is hard to control in a centralized or top-down way.
- Stakeholders (and even countries) will often fail to behave as they prefer or as they should, because they cannot act independently.

These characteristic properties of complex, strongly coupled system need to be considered when trying to find successful solutions to the 21st century challenges facing humanity.

1.3 Efficient markets or herding behavior?

> "I can calculate the motion of heavenly bodies, but not the madness of people", said Isaac Newton.

All the above features can be observed in our financial and economic system, and this casts doubt on the classical equilibrium picture. The latest manifestation of the equilibrium perspective is reflected, in particular, by the theory embodied in standard macroeconomic models and, in particular, in Dynamic Stochastic General Equilibrium (DSGE) models. According to these models, market instabilities such as bubbles and crashes should not happen.[14]

While many people believe that bubbles and crashes actually *do* occur, the equilibrium paradigm, when applied to financial markets, is based on the efficient markets hypothesis that was first developed by Bachelier[15] (1900) and later exploited by Fama (1965)[16]. This

[13] D. Helbing (2011) New science and technology to manage our complex, strongly connected world, preprint http://arxiv.org/abs/1108.6131, see also D. Helbing and A. Carbone (eds.) Participatory Science and Computing for Our Complex World, *EPJST* **214**, 1-666 (2012).
[14] These traditional models also neglect banks as separate, self-interested stakeholders in the system, while they may affect an equilibrium in reality.
[15] Bachelier, L. (1900) *Theorie de la Speculation*, Paris: Gauthier-Villars.

hypothesis – and it is no more than that – asserts that all the available and relevant information as to an asset is contained in its price. There is an obvious paradox here underlined by Grossman and Stiglitz[17] (1980) who observed that, if the efficient markets hypothesis were valid, nobody would have any incentive to gather information and therefore it could never become public in prices.

It is worth reflecting a little on this fundamental problem. What Bachelier in effect postulated was that individuals, independently of each other, gather pieces of information about an asset, and that these arrive randomly. Once they have obtained their information, they act on it by purchasing or selling the asset in question and, by so doing, have an influence on its price and it is in this way that the information becomes public. It is conceivable that markets may function in this way. For example, Hayek (1945)[18] was convinced that they satisfy the principle of the "wisdom of crowds", where many individuals make judgements about some variable and, as each finds some potentially relevant information, they collectively arrive at an accurate judgement. However, this principle works only, if the market participants take independent decisions, which is certainly not a realistic assumption and, as the mathematician Henri Poincaré (1908)[19], who was the referee of Bachelier's thesis, stated:

> "Quand des hommes sont rapprochés, ils ne se décident plus au hasard et indépendamment les uns des autres; ils réagissent les uns sur les autres. Des causes multiples entrent en action, et elles troublent les hommes, les entraînent à droite et à gauche, mais il y a une chose qu'elles ne peuvent détruire, ce sont leurs habitudes de moutons de Panurge. Et c'est cela qui se conserve." [When people are in close contact they do not act randomly and independently of each other; they react to each other. Many factors come into play, and they perturb people, and move them right and left, but there is one thing that they cannot destroy, which is people's tendency to act like sheep. And, it is that which is conserved.]

Indeed, information feedbacks create herding effects, which are amplified under conditions of information overload, risk, and uncertainty. Such herding behavior (also characterised as "animal spirits", see Akerlof and Shiller[20] 2009) can produce undesirable correlations in the markets, which are a typical feature of bubbles and crashes, and thereby undermine the efficiency of markets. In fact, ECB president Jean-Claude Trichet pointed out:

> "A large number of aspects of the observed behaviour of financial markets is hard to reconcile with the efficient market hypothesis."

1.4 Is it useful to have more and more liquidity?

It is generally argued that a lack of liquidity is harmful for the economy, since – if funds are not readily available – this prevents new investments from being made and, more generally, an economy from reaching an equilibrium between supply and demand. However, the willingness of market participants to invest in new real-world business activities is conditioned by their expectations as to the future state of the economy. Even if the interest rate at which

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[16] Fama, E.F. (1965). "The Behavior of Stock Market Prices", *Journal of Business*, Vol. 38, No. 1, pp. 31-105.
[17] S.J. Grossman and J.E. Stiglitz, On the impossibility of informationally efficient markets. American Economic Review 70(3), 393-408 (1980).
[18] Hayek, F.A. (1945). "The use of knowledge in society". American Economic Review 35, 519-530.
[19] Poincaré H (1908) *Science et Methode*, Paris.
[20] Akerlof George A. and Robert J. Shiller (2009) *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism* (Princeton, Princeton University Press).

they can obtain capital is low, real investments will not be forthcoming, if economic growth is weak and uncertain. Under such conditions, financial speculation may seem to be a more attractive alternative. Therefore, as long as business and investment banking are not well separated, a lack of real investments may occur even when enough liquidity is available. Moreover, the availability of too much liquidity, as it can occur when cheap money is provided by central banks to fight the financial crisis, may amplify bubbles and crashes. Commercial banks may prefer to borrow at low rates from the central bank and then invest the funds in government bonds, for example. Since, in times of crisis, some of the latter yield a high rate of return, the banks can make a substantial, though risky, profit without financing any real investments.

Financial transactions on foreign currency exchange markets now amount to 3000 to 4000 billion dollars each day, which is many times the Gross World Product (i.e. the sum of the Gross Domestic Products of all countries). It is hard to imagine that such an amount of financial activity is really needed for markets to perform their basic functions well. Recall that the role of financial markets is to match as effectively as possible those who wish to invest with those who wish to borrow. However, if people invest because of their speculation on the change in asset prices rather than on the basis of the profitability of the activity that these assets represent, the situation changes. In fact, consider a situation in which many market participants are borrowing money at relatively cheap rates in the hope of earning higher profits by speculation. Because of the positive feedback (or as George Soros (1998)[21] described it, "reflexitivity" of their acts), stock prices will be driven up. This can then result in stock prices that are increasing much faster on average than economic growth. In this way, profits become "virtual" rather than real. The value of the resources on which all the holders have claims no longer corresponds to the apparent market value. Thus the owners of these assets can individually liquidate them at current prices, but if people try to do this collectively, the price of the assets will fall sharply.

While increasing stock prices allow individual investors to make large profits or to earn large bonuses, they are not sustainable in the long run. These profits are *real* for those who sell the assets when they have reached higher prices, but they are *virtual* for others, who wait for a good moment to sell. The latter, on the basis of their apparent increase in wealth, continue to buy assets or to make real investments without liquidating their financial assets. This is what economists refer to as the "wealth effect". People act in this way in the belief that, if problems arise, they will simply be able to sell their assets at high prices, which are however artificially inflated. Hence, financial investments based on borrowing money at lower rates than the expected gain (when the latter is not based on any real increase in resources or returns) can create bubbles that are destined to burst, afterwards creating an even worse economic situation than before, as the "wealth effect" becomes negative. Influenced by their apparent loss of wealth, individuals now start to save more and to spend less, thus reinforcing the crisis.

The premise that more and more liquid financial markets are good for our economy must therefore be abandoned, particularly when the money involved goes mainly into financial speculation rather than into real economic investments. Again, we should add a caveat here, since the desire to invest the gains from financial speculation can have a significant effect on the prices of *real* assets. This is particularly evident in the case of real estate, where individuals purchase homes in the belief that their investments will be justified by an increase in house prices and, for the same reason, banks are willing to lend to risky purchasers with a

[21] Soros G, (2008) *The Crash of 2008 and what it means,* Public Affairs New York, New York.

limited capacity to repay.

Note that the faith in the benefits of increasingly liquid financial markets has often been used to justify controversial financial strategies such as:

1. high levels of leverage (which not only means that financial actors such as hedge funds were taking very large positions with very limited funds, but also that households borrowed nearly 100% of the price of their home, and that banks lent with little cash reserves);
2. "naked" short-selling (i.e. selling of financial assets or buying insurance on losses of such assets without actually owning them, which is like taking out fire insurance on someone else's home);
3. high-frequency trading (which has been greatly accelerated by the introduction of computerized, algorithmic trading).

These mechanisms have been blamed by various stakeholders for creating or amplifying instabilities in financial markets, for example, by creating "strategic distrust". In fact, all these innovations could not prevent the flash crash on May 6, 2010, and computerized trading was responsible for this event to a considerable extent. During that brief crash, stocks of some big companies were devalued by a factor of about 100, which could have completely changed the ownership structure of companies within minutes.

1.4.1 What is the role of leverage, opaqueness, and Ponzi schemes?

Leverage effects[22] have contributed to a disproportionate growth of the financial sector. There are now some 150 multi-national companies, which account for nearly half the total capitalisation of all firms.[23] Three quarters of these belong to the financial sector. This group of transnational corporations, which are strongly interlinked, poses a "too big (or too connected) to fail" problem[24] (i.e. a situation in which the failure of any of these companies might have a systemic impact on the world economy). While many other aspects of recent developments are also responsible for the shift in the control of the economy to the financial sector, the acceptance of high levels of leverage was certainly a major component in the development of hedge funds, for example.

The instability of the financial system is further increased by the lack of transparency (opaqueness). In addition to over-the-counter trades, which are never recorded in a public order book ("shadow banking"), the increased complexity of financial products largely contributes to this opaqueness. Therefore, hedging risks does not necessarily reduce those risks. It is an error to believe that an increasing number of financial instruments will increase market performance. It can, on the contrary, produce systemic instability.[25]
In fact, the complexity of financial products creates new risks, as the case of credit default

[22] For a comprehensive critical discussion of the role of leverage in exarcebating the current crisis see John Geanakoplos (2009) "The Leverage Cycle". *Cowles Foundation Discussion Paper* No. 1715 (Cowles Foundation, Yale University).
[23] S. Vitali, J.B. Glattfelder, and S. Battiston, The network of global corporate control. PLoS One 6(10), e25995 (2011).
[24] Bank for International Settlements (2011) Global systemically important banks: assessment methodology and the additional loss absorbency requirement. Available at http://www.bis.org/publ/bcbs207.pdf.
[25] F. Caccioli, M. Marsili, and P. Vivo, Eroding market stability by proliferation of financial instruments. EPJB 71, 467-479 (2009); F. Caccioli and M. Marsili, Information efficiency and financial stability, The Open-Access, Open-Assessment E-Journal 4, 20 (2010).

swaps has made very clear. Many of these financial instruments are constructed like a house of cards (with a close linkage between those who are borrowing and lending). It can collapse due to unexpected disruptions (such as the default of Lehmann brothers), but can also simply unwind as the connections cause contagion.

Warren Buffet warned of this possibility long before the current crisis emerged (see below), and he was not alone. Martin Mayer (1999) said[26]:

> "Why are such derivatives dangerous? The one lesson history teaches in the financial markets is that there will come a day unlike any other day. At this point the participants would like to say all bets are off, but in fact the bets have been placed and cannot be changed. The leverage that once multiplied income will now devastate principal."

But what did Buffet tell his shareholders?

> "Many people argue that derivatives reduce systemic problems, in that participants who can't bear certain risks are able to transfer them to stronger hands. These people believe that derivatives act to stabilize the economy, facilitate trade, and eliminate bumps for individual participants. On a micro level, what they say is often true. I believe, however, that the macro picture is dangerous and getting more so. Large amounts of risk, particularly credit risk, have become concentrated in the hands of relatively few derivatives dealers, who in addition trade extensively with one other. The troubles of one could quickly infect the others. On top of that, these dealers are owed huge amounts by non-dealer counter-parties. Some of these counter-parties, are linked in ways that could cause them to run into a problem because of a single event, such as the implosion of the telecom industry. Linkage, when it suddenly surfaces, can trigger serious systemic problems. The derivatives genie is now well out of the bottle, and these instruments will almost certainly multiply in variety and number until some event makes their toxicity clear. Central banks and governments have so far found no effective way to control, or even monitor, the risks posed by these contracts. In my view, derivatives are financial weapons of mass destruction, carrying dangers that, while now latent, are potentially lethal." (Warren Buffet, Chairman's letter to the shareholders of Berkshire Hathaway Inc. February 2003.)

Such problems apply even more to Ponzi schemes, i.e. schemes where obligations to earlier investors have to be fulfilled by using later investments. This can only be sustained for a limited time until the supply of new investors dries up. It has been argued that pay-as-you-go pension systems, which have been adopted in many countries, also have this sort of characteristic. However, if the population remains constant and life expectancy does not increase, there may always be enough newcomers to ensure the payments, while in a Ponzi scheme the number of newcomers has to be continually expanding, since all of the "oldest" investors always have a claim. Indeed, it is the very fact that life expectancy is increasing in most countries that creates anxieties over the viability of today's pension schemes.

1.4.2 The role of high-frequency trading and transaction fees

An argument that is often advanced is that the increased speed and reactivity of markets is, at

[26] Mayer M, (1999) "The dangers of derivatives", Opinion, *Wall Street Journal* May 27th 2009.

least in part, a solution to the problem of improving the efficiency of the financial sector. However, there must be fundamental concerns about systems, which run faster than humans can take qualified decisions, especially when such systems can have global impacts. In this connection, it must also be observed that each of the three financial developments mentioned in Section 1.4 have the potential to destabilize financial markets.[27] As an illustration, it may be helpful to take an example from physics, where it is known that friction may have positive sides, and where increasing liquidity corresponds to reducing the viscosity of a fluid (i.e. its internal friction). This can turn a stable, laminar flow into a turbulent flow, very much like what we observe in volatile markets. Therefore, friction in markets, as it would be produced by transaction fees (such as a Tobin tax or variants of it), should not necessarily be thought of as a problem. However, this does not, of course, mean that introducing large amounts of friction would be beneficial, since this could bring markets to a halt. The appropriate amount of friction would therefore have to be carefully and adaptively chosen.[28]

1.5. Does networking reduce risks?

An additional feature of modern economies is the rapid development and increasing connectivity of the network, which links individuals and institutions. This has frequently been cited as indicating that the diversification of risk is better and that the system is less vulnerable. However, as the observations of Warren Buffet cited in the previous section indicate, this is far from being obvious. The essential point is then, that the degree of networking and interdependency may contribute to the instability of the financial system (not just to the afore-mentioned degree of opaqueness). Thus, while some networking can distribute the risks among many market participants and reduce them (according to the statistical law of large numbers), this requires the participants to act independently. That is why a large amount of network interdependencies can create systemic risks, i.e. the danger of so-called domino or cascade effects.[29] In Section 5.1, we will further argue that too much networking can also reduce the ability to establish cooperation in the economic system, creating a situation in which the economy, society, and every single market participant can suffer losses.

1.6. The increasing spread of the wealth distribution

Finally, it is useful to point out that market instabilities can also have other important consequences, e.g. to redistribute money between market participants and create large

[27] Such instabilities are certainly increased by the possibility of circumventing "conservation laws" (by, for example, creating new credit).

[28] It is well-known that many physical systems work well only due to some degree of friction, but to avoid misunderstandings, we wish to note here that we refer to physical models and use physical analogies only in contexts where we believe we can learn something from them. In the above case, the concept of friction might be considered as a reasonable metaphor for the introduction of the Tobin tax and variants of it. We do not, however, propose to transfer physical concepts one-to-one into a financial systems setting. The use of loose analogies can generate very misleading conclusions. One always needs to systematically explore under what conditions financial or economic systems display similar dynamics, and where physical concepts need to be generalized or where it would be more appropriate to use concepts from other disciplines. A good account of the usefulness of concepts from statistical physics is given by Jean-Philippe Bouchaud (2008) in "Economics needs a scientific revolution", *Nature* **455**, 1181 (2008).

[29] A general model of this is P. Ormerod and R. Colbaugh, 'Cascades of Failure and Extinction in Evolving Complex Systems', J. Artificial Societies and Social Simulation, 9(4)9 (2006) http://jasss.soc.surrey.ac.uk/9/4/9.html; S. Battiston, D. Delli Gatti, M. Gallegati, B. Greenwald, and J.E. Stiglitz, Credit chains and bankruptcy propagation in production networks. Journal of Economic Dynamics and Control 31(6), 2061-2084 (2007); G. Tedeschi, A. Mazloumian, M. Gallegati, and D. Helbing (2012) Bankruptcy cascades in interbank markets. *PLoS ONE* **7**(12): e52749.

differences in wealth and power within a short time.[30] This may actually be a reason, why effective measures to reduce these instabilities have not yet been taken. Whether a highly unequal wealth distribution is necessary to ensure large investments or economic and societal progress, or whether it endangers social well-being, is still a matter of debate and needs to be further explored. There are clearly policies which can reduce inequality *and* promote growth whilst in other cases the two aims may be in conflict. As a recent report from the OECD explains:[31]

> "Despite a vast theoretical literature on the link between inequality and growth, no consensus has emerged and the empirical evidence is inconclusive. Still, specific structural reforms that aim at raising living standards also influence the distribution of income. Taxes and transfers, for instance, do not only affect the distribution of income; they also impinge on GDP per capita by influencing labour use and productivity. Some tax reforms appear to be win-win options – improving growth prospects while narrowing the distribution of income. Others, however, may imply a trade-off between these objectives".

Note that the existence of an unequal wealth distribution does not necessarily imply that some individuals possess special prerequisites or skills.[32] Indeed, consider the following thought experiment: Assume that at each point in time individuals make economic transactions, and that some of them are losers and some of them winners. Furthermore, suppose that it is essentially a matter of chance, who loses and who wins. Of course, it is a basic tenet of economic theory that exchanges, into which partners enter voluntarily, are beneficial to all. However, as soon as there is uncertainty, this is only true in expectation and some individuals may lose in reality. Our argument holds also when the partners all gain, as long as the gains are unequal, in which case those who we describe as "losers" are simply those who gain less. Then, in the course of many transactions, there will be some richer and some poorer market participants, just due to the laws of statistics. Of course, the richer will eventually gain more power and furthermore as a result of their wealth will have a better chance to succeed in the future,[33] and this will provide them with special opportunities that their poorer counterparts do not have. All of this means that the rich tend to get richer ("Matthew effect"). As a result of such mechanisms, even if everybody were equally wealthy in the beginning, a hierarchical organization would eventually evolve in the system, with a few rich and many poorer market participants. This corresponds to what is known as Zipf's Law[34]. This simple process, by which those who have most acquire more, is a fundamental mechanism. It can explain many distributions, not just those of income and wealth, but also the size distribution of cities, for example. If those who choose a city to live in, have a higher probability of choosing a *larger* city, this will lead to a skewed city size distribution (see Krugman (1996)[35] for a treatment of

[30] The WEF report on "Global Risks 2012" (http://www.weforum.org/reports/global-risks-2012-seventh-edition), for example, concludes: "Economic imbalances and social inequality risk reversing the gains of globalization…", see also the following videos for some statistical facts: http://mashable.com/2013/03/02/wealth-inequality/, http://www.youtube.com/watch?v=uWSxzjyMNpU

[31] OECD (2012) "Income inequality and growth: The role of taxes and transfers", *OECD Economics Department Policy Notes,* No. 9. January 2012.

[32] See the chapter on the "Outcome Bias" in the book by Rolf Dobelli, The Art of Thinking Clearly: Better Thinking, Better Decisions. Sceptre (2013).

[33] See the section on "Multiplicative asset exchange" in S. Ispolatov, P.L. Krapivsky, and S. Redner, Wealth distributions in asset exchange models, EPJB 2, 267-276 (1998).

[34] See Aaron Krowne, "Zipf's law" (version 4). *PlanetMath.org*. http://planetmath.org/ZipfsLaw.html

[35] Krugman, P. (1996) *The Self Organizing Economy* (Wiley-Blackwell, Oxford).

this phenomenon).

If one wanted to change this natural tendency towards increasing inequality (even though no political system has succeeded with this so far), one would have to implement other mechanisms to share gains. For example, in the cake-cutting example of Sec. 4.3, the power would seem to be in the hands of the person who divides the cake. However, as soon as one allows the other participant(s) to choose the preferred piece(s) of the divided cake first, the power shifts from the divider to the chooser(s). Thus, the outcome of the 'redistribution game' discussed above depends crucially on the rules of the game.

Again, it is often said that everyone gains from free trade, and that when the tide raises all the boats rise with it. However, this is not correct. What can be shown in rather simple models is that those who gain from free trade could compensate those who lose and would still be better off. So far, however, no such general mechanism has been developed for this to happen. Hence, despite the potential gains, many individuals are losers.

However, it should not be taken for granted that inequality itself is intrinsically harmful. An unequal initial wealth distribution and the related hierarchy of power might, together with tax-based or philanthropic or other ex post redistribution measures, overall have more positive than negative effects (it may, for example, help to promote investments and coordination, and stimulate a healthy degree of competition in society). But there is an important debate on the causality here (see e.g. Kuznets (1955), Barro (2000), Banerjee and Duflo (2003), Piketty and Saez (2003), Berg and Ostry (2011), and the OECD (2012) report to which we have already referred[36]): Is greater inequality the cause or result of growth?

2. Can we rely on our current understanding of the economy?

Economics has long had the ambition to become an "exact science". Indeed, Walras, usually recognised as the father of modern economic theory, said in his *Lettre no. 1454 to Hermann Laurent in Jaffe (1965)*[37]:

> "All these results are marvels of the simple application of the language of mathematics to the quantitative notion of need or utility. Refine this application as much as you will but you can be sure that the economic laws that result from it are just as rational, just as precise and just as incontrovertible as were the laws of astronomy at the end of the 17th century."

Furthermore his successors openly declared themselves as having the same goal. However, two things raise doubts as to whether the pursuit of this ambition has achieved meaningful

[36] Kuznets, S. (1955). "Economic Growth and Income Inequality," *American Economic Review* 45, 1–28. Piketty, T., and E. Saez, 2003, "Income Inequality in the United States, 1913–1998," *Quarterly Journal of Economics*, Vol. 118, No. 1, pp. 1–39. Barro, R. J., 2000, "Inequality and Growth in a Panel of Countries," *Journal of Economic Growth,* Vol. 5, No. 1, pp. 5–32. Banerjee, A. V., and E. Duflo, 2003, "Inequality and Growth: What Can the Data Say?" *Journal of Economic Growth*, Vol. 8, No. 3, pp.267–99. Berg Andrew G. and Jonathan D. Ostry (2011) "Inequality and Unsustainable Growth: Two Sides of the Same Coin?" IMF working paper SDN/11/08 *OECD* 2012, "Income *inequality and growth*: The role of taxes and transfers", *OECD*. Economics Department Policy Notes, No. 9.

[37] *Jaffé W, (ed) (1965) Correspondence of Leon Walras and related papers, Vols I-III. North Holland, Amsterdam.*

results (see Kirman,[38] 2012). First, as in any science, models have to be built on assumptions, and it is a standard procedure to develop those assumptions on the basis of a careful analysis of the observed empirical facts. This inductive approach, however, is not the one prevailing in economics, where widespread assumptions are based on the introspection of economists. This has been acknowledged by many distinguished economists from Pareto[39] (1916) to Hicks[40] (1939) to Koopmans[41] (1957), for example. Second, and perhaps worse, the reference model in economics is one with isolated optimizing individuals. This model of "perfect competition" is considered as a useful idealization, and features such as the aggregate effects of the direct interaction between individuals are thought of as inconvenient "imperfections". However, deviations between economic theory and reality may be of crucial importance in practice, and the consideration of the links between individuals and institutions cannot be written off as being of little relevance to the behaviour of the system as a whole. This is a lesson that is clear to all those, who are familiar with the analysis of complex systems. Given the systemic impact of certain financial instruments (such as large leverage effects, the market for credit default swaps, etc.), it would seem to be unreasonable to put too much trust in conventional economic models, in which the structure of the interactions between the participants in the system is not included in the underlying assumptions.

2.1. Is it rational to believe in the 'homo economicus'?

The assumption behind the concept of the 'homo economics' is that humans behave like perfect egoists, and Poincaré (1996)[42] criticized Walras for this. However, the rational, strictly optimizing behaviour behind this assumption can be questioned for a number of reasons. This includes the fact that many optimization problems cannot be solved in real-time, even with supercomputers. Further problems result from a lack or uncertainty of information, or limited memory and processing capacities of humans. Furthermore, as a matter of principle, it is impossible to have an exact representation and simulation of the whole world and its future (including the states of the brains of all other people) in one single brain. Besides, there are many empirical and experimental studies that question the assumption of strict rationality as formulated by economists, and some of this critical work has even been rewarded with Nobel prizes in economics.[43]

This suggests that the assumption of isolated optimising agents is at best questionable and that one can, furthermore, not rely on the idea that a system of such agents will automatically self-organise in an *efficient* way. This leads naturally to the next question.

2.2. Are financial markets efficient?

The basic role of financial markets is to ensure the best possible matching between those who wish to place their money and those who need to borrow it to finance their projects. To achieve this, it is argued that markets should ensure the transmission of all the information

[38] "Walras' Unfortunate Legacy" in Bridel P (ed) *General Equilibrium Analysis: A Century after Walras* (Routledge Studies in the History of Economics) 2012.
[39] Pareto, V. (1916) Trattato di sociologia generale, 2 vols., Florence: Barbera; 2nd edn, 3 vols., Florence, 1923; transl. A. Bongiorno and A. Livingston, The mind and society, 4 vols., London: Cape, 1935.
[40] Hicks, John (1939) *Value and Capital*, Oxford, Oxford University Press
[41] Koopmans, T. (1957) Three essays on the state of economic science, New York: McGraw-Hill.
[42] Letter appended to Walras, L. (1960), ÉCONOMIQUE ET MÉCANIQUE. Metroeconomica, 12: 3–11. doi: 10.1111/j.1467-999X.1960.tb00510.
[43] See D. Helbing and S. Balietti (2010) Fundamental and real-world challenges in economics. *Science and Culture* **76**(9-10), 399-417, where also further theoretical inconsistencies are discussed.

necessary to the parties involved. Indeed, the efficient market hypothesis assumes that this will be the case and market mechanisms will guarantee that all the information relevant for the value of an asset will, at any point in time, be contained in the price of that asset. Indeed, it is assumed that any possibility to make systematic profits will be neutralized immediately by trades exploiting this opportunity. Moreover, with little theoretical justification, it is assumed that the arbitraging away of profitable opportunities will be a stable process and that the market will immediately return to equilibrium. Both behavioural and experimental economics, however, have shown that there can be "excess movements" in positive and negative directions, even when the fundamental value of the asset is well defined and known to all market participants.[44] Such herding is not necessarily "irrational", since following the trend can be profitable in the short run, especially if one is among the first to notice and profit from a switching trend. (Note that many traders in financial markets are paid on the basis of their short run profits and may even be forbidden to take long positions.)

However, if the efficient market hypothesis were satisfied, herding effects, bubbles and crashes should not occur. This is because of the implicit assumption of the underlying theory that traders will make investments based on their own, independent observations and will not infer information from the behaviour of others. Unfortunately, the information feedback through stock markets promotes trend following and correlated decisions, which may undermine the wisdom-of-crowd effect and affect the efficiency of the market.[45]

The random walk hypothesis underlying the theory of efficient financial markets goes back to Bachelier[15] (1900), who assumed that individuals would act independently of each other. However, as we pointed out, already the distinguished French mathematician Poincaré (1900)[46] warned that this was not the case. He rather said that people have a natural tendency to act like "sheep", see also Akerlof and Shiller (2009)[47] or Chamley (2004)[48]. This undermines the whole idea on which the efficient markets hypothesis is based. In fact, most financial traders do not seem to believe in efficient markets, as they are theoretically postulated and do not see their activity as being to arbitrage away opportunities created by small deviations from fundamental values. They rather tend to take positions based on their anticipation of trends in the market, or based on attempts to trigger such trends.

2.3. Are emotions and social factors irrelevant?

The assumption of the isolated "homo economicus" acting according to some abstract assumptions governing his rationality also tends to neglect cognitive, human and social factors, such as individual learning, emotions, and conformity to social norms. For a realistic understanding of individual behaviour, it is necessary to take such factors into consideration. For example, most individuals have a tendency towards fair behaviour, as Adam Smith, in his less widely cited work, "The Theory of Moral Sentiments"[49] emphasised. However, this is not

[44] C. H. Hommes, Modeling the stylized facts in finance through simple nonlinear adaptive systems. Proceedings of the National Academy of Sciences of the USA (PNAS) 99, Suppl. 3, 7221-7228 (2002).
[45] J. Lorenz, H. Rauhut, F. Schweitzer, and D. Helbing (2011) How social influence can undermine the wisdom of crowd effect. *Proceedings of the National Academy of Sciences USA (PNAS)* **108**(28), 9020-9025.
[46] Poincaré H (1900) Rapport sur la these de Louis Bachelier Université de Paris Sorbonne.
[47] Akerlof, G. and R. Shiller (2009) Animal spirits: How human psychology drives the economy, and why it matters for global capitalism (Princeton, NJ: Princeton University Press).
[48] Chamley, C. (2004) *Rational Herds* (Cambridge: Cambridge University Press).
[49] Smith, A. 1976 (1759) *The Theory of Moral Sentiments* (eds). D. Raphael & A. L. Macfie). Oxford, UK: Oxford University Press.

consistent with the assumption of strict maximization of narrowly defined self-interest.[50] In fact, recent research indicates that other-regarding preferences can spread even in a competitive evolutionary setting, in contrast to what has been assumed in the past.[51] Recent work by Seabright (2004)[52] and by Bowles and Gintis (2012)[53] follows an evolutionary approach to economic cooperation as well. The adoption of social norms can also overcome the tendency to "free ride" – an inherent feature of a number of social dilemmas. Perhaps surprisingly, restricting individual selfishness by complying with social norms can not only lead to a better *systemic* performance, but also to better *individual* performance in the long run (Grund, Waloszek, Helbing[51] 2013). This idea is at the heart of the notion of "team reasoning" developed by Bacharach (2006)[54].

2.4. Can the collective behaviour of agents be understood from a "representative" individual's behaviour?

Another widespread assumption in macroeconomic theory is that the economy or some sector of it can be thought of as behaving like a 'representative agent'. According to this, the behaviour of the economy can be analysed by considering the aggregate economy as if it were one typical agent reacting to aggregate economic variables. This basically implies that the differences between agents of the same kind (e.g. traders, companies, institutions or other stakeholders) are unimportant or cancel out on average. Therefore, it suffices to analyse one average agent who effectively represents the behaviour of all of them.

The reasons for making this assumption are clear: With our usual, highly restrictive assumptions on agents, we cannot be sure that economic equilibrium, which is the focus of most economic models, is either unique or stable[55]. This makes the analysis of the effects of changes in the economy or of policy measures analytically intractable. By adopting the representative agent approach, this problem is avoided, but by doing so, heterogeneity in individual preferences as well as local, network and context effects are neglected. Thus the representative individual is just the average of many individuals, each responding rationally to the full set of information.

This "mean field approximation" would probably work reasonably well, if all individuals would only interact with each other globally, for example through a shared market. However, the approximation is likely to fail in other contexts. In social dilemma situations or public goods problems, for example, global interaction can lead to the breakdown of cooperative behaviour due to selfish optimization, a scenario that is known as the "tragedy of the commons". Local interactions, in contrast, may promote cooperation under otherwise identical conditions.[56]

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[50] E. Fehr and K. M. Schmidt, A theory of fairness, competition, and cooperation. *The Quarterly Journal of Economics* **114**(3), 817-868 (1999).
[51] T. Grund, C. Waloszek, and D. Helbing, How natural selection can create both self- and other-regarding preferences, and networked minds. Sci. Rep. 3: 1480 (2013).
[52] Seabright, Paul (2004). *The Company of Strangers*: A Natural History of Economic Life. Princeton and Oxford: Princeton University Press.
[53] S. Bowles and H. Gintis (2012) *A Cooperative Species: Human Reciprocity and Its Evolution* (Princeton, N.J.: Princeton University Press).
[54] M. Bacharach (2006) *Beyond Individual Choice: Teams and Frames in Game Theory* (Princeton, NJ: Princeton University Press, 2006).
[55] This was shown by Sonnenschein, Mantel, and Debreu in the mid '70s. For a summary of their findings and how this led to the use of the representative agent, see A. Kirman (1992) 'What or whom does the representative individual represent?' *Journal of Economic Perspectives* **6**(2): 11-36.
[56] D. Helbing, A. Szolnoki, M. Perc, and G. Szabó (2010) Evolutionary establishment of moral and double moral standards through spatial interactions. *PLoS Computational Biology* **6**(4), e1000758.

2.5. Does the 'invisible hand' really exist and work?

Finally, it is important to point out that, for an economic system to work well, it is not sufficient that all the individual components are well designed and behaving optimally. In contrast to what one might expect according to the modern (re)interpretation of the principle of the "invisible hand", the interactions of the components of a system with network interdependencies can lead to coordination failures or to a malfunctioning of the system and its components.[57]

Of course, instances of "market failure" are well-known in economics, but it is usually argued that they constitute an exception, resulting for example from market power (such as "monopolies"), externalities, or information asymmetries. In contrast to this, there is also a possibility that market systems fail when all market participants have *equal* power and there are no asymmetries or negative externalities. Even if all the interacting partners have the very best intentions, their interactions can produce undesired outcomes, such as crowd disasters (Helbing[12] 2013).

In fact, the interaction of components that individually try to optimize their expected outcome (i.e. behave perfectly rationally from their own point of view, as assumed for the "homo economicus") can lead to a situation, where the system gets stuck in a suboptimal state. The tragedy of the commons mentioned above is a good example of this. The approach used to analyse that problem is non-cooperative game theory, and it is one of the few areas of economics that takes the consequences of the direct and conscious interaction between individuals explicitly into account. It is important to note that, for most equilibria of non-cooperative economic games, the result is socially suboptimal.

If we pay attention to dynamical issues, it turns out that the system may also behave in an *unstable* way. To take a well-known example, a spontaneous breakdown of free traffic flows can happen even in the absence of bottlenecks or other external reasons, as delayed adaptations to small variations in the traffic flows may cause over-reactions and chain reactions that finally force drivers to stop. Interestingly, traffic flows tend to destabilize when the system reaches its greatest efficiency, i.e. the maximum flow. This instability causes a considerable reduction in the effective freeway capacity. In other words, dynamic interactions can cause a loss of capacity, just when the system reaches the point of maximum capacity!

Such unstable behaviour is quite unexpected, particularly as it happens despite everybody's best efforts to prevent it (Helbing[12] 2013). Nevertheless, similar phenomena may also occur in economic systems, for example, recession periods or sudden meltdowns in the financial system. One of the insights from this is that the financial system may be affected even in the absence of external shocks and even when all the individual stakeholders in the system appear to be in good order. This may explain why most economic experts did not see the financial crisis coming. A familiarity with complex systems analysis would have shown that it is not enough to examine the state of the individual components of a system, but one also has to examine the network that links them, if one wants to be able to understand and detect systemic problems such as a possible cascade effect. These factors have not been considered by banking regulations for a long time. The initial Basel agreements just focused on the vulnerability of individual banks rather than on their role in the system. Recently this

[57] C. Roca, M. Draief, and D. Helbing, Coordination and competitive innovation spreading in social networks. In: D. Helbing (ed.) Social Self-Organization (Springer, Berlin, 2012).

attitude is changing, particularly as result of the work on financial networks conducted by the Bank of England (see Haldane and May[58] 2011).

3. Can we stop domino effects in our financial system?

3.1. Domino and cascade effects

Given the various sources of instability, which we have discussed in the previous sections, the question of the systemic impacts of such instabilities occurs. In fact, a problem in one sector of an economy can trigger problems in other sectors of that economy, and a weakness of one financial asset can trigger the weakness of related financial assets.[59] For example, what started as a US real estate bubble (when more and more people were buying houses with bank loans with little or no down payment and often no guaranteed income, based on the expectation of rising prices) eventually ended in a global crisis. Even though the subprime mortgage problem was substantial, it could have been easily covered by the American government (or tax payer). Clearly, the decision to support banks (instead of house owners) through a historical bailout plan, was insufficient to prevent the crisis. Instead, the US subprime mortgage crisis became a crisis of mortgage companies, of lenders, of home builders, of financial markets, of the US economy, of the world economy, and of political and social systems in various continents all over the world. In other words, trouble in one part of the system can affect other parts of the system through cascade effects, and this can turn a local problem into a costly global crisis.

3.2. Is there a chance to cope with financial crises?

So far, the financial, economic and public spending crisis has created losses of many trillions of US dollars worldwide, and it is far from evident that the worst has passed. Only few would argue that the macro economy during the crisis has just performed a shift to a new equilibrium. Therefore, it is both necessary and urgent to develop non-equilibrium models allowing one to explore the consequences of certain economic policies (such as austerity measures to reduce public spending deficits). Cascade failures such as the one described above are more difficult to imagine than a system which is generally in a steady state, but occasionally gets knocked off its equilibrium by some unexpected exogenous shock. This is true, because such cascades have a probabilistic nature, and moreover, they are based on complicated, delayed feedback effects and network interdependencies, which can lead to counter-intuitive system behaviours. As a consequence, the same cause can have different effects, and the same effect can have different causes. Moreover, each further step in the cascade effect leads to a deterioration in the situation and diminishes the chances of recovery further, so that larger and larger parts of the system are affected. Note that, due to the network nature of cascade effects, the next “act” of the crisis can be triggered by many different events, or even by minor random variations (and correlated responses to them) (Helbing[12] 2013).

However, although the exact timing of major events in failure cascades cannot be predicted, the symptoms of systemic weaknesses can be recognized, and possible onsets of the deterioration can often be anticipated. This in itself can help to identify possible

[58] Andrew G. Haldane and Robert May, Systemic risk in banking ecosystems**.** *Nature* 469, 351-355 (2011).

[59] Preis, T., Kenett, D.Y., Stanley, H.E., Helbing, D., and Ben-Jacob, E. Quantifying the behaviour of stock correlations under market stress. *Scientific Reports* **2**: 752 (2012).

countermeasures.[60] To stop successive cascades before the worst-case scenario has happened, one needs to strengthen the robustness of those system components, which are likely to be endangered next, thereby potentially endangering others. In addition, effective crisis management requires one to elaborate and exercise contingency plans (a "plan B", a "plan C", etc.), to act quickly[61], and to have a backup system (such as a second financial system), see the discussion below.

3.3. Can the financial system cope with cascade effects?

The dramatic failure in stabilizing the financial system seems to be due to a number of causes:

1. The architecture of the financial system lacks mechanisms to stop cascade effects, while such mechanisms are standard, for example, in our electrical system. The latter has in-built circuit breakers to stop local problems from propagating. Similarly, our computer systems have firewalls.
2. According to the dominant paradigm of equilibrium economics and efficient markets, such instabilities and cascade effects should not happen at all. Therefore, it may not have seemed necessary to work out contingency plans and to implement suitable safety precautions.

The basis for this attitude was a model, which assumed that all the market participants have a complete (or at least sufficient) understanding of how the economy works while, as Bernanke observed:

> "I just think it is not realistic to think that human beings can fully anticipate all possible interactions and complex developments. The best approach for dealing with this uncertainty is to make sure that the system is fundamentally resilient and that we have as many fail-safes and back-up arrangements as possible." (Ben Bernanke in an Interview with the IHT, 17 May 2010)

Banks in the current system are very closely interlinked both through transactions and loans and through joint ownership. Most of the current discussion focuses on which banks are "too big to fail" and this now involves considerations of the banks' role in the network as contributors to systemic risk. However, one way to make the system more resilient might be to put in place regulations, which encourage the establishment of several independent or weakly coupled, parallel banking systems, which compete with each other. Most of current regulatory practices are focused on competition *within* the existing system, without envisaging competition *between* systems. In each such banking system, the participating banks could be strongly interdependent; however, the dependence on banks of competing systems should be weak.

Historically, the tendency has been in the opposite direction: the banking systems of different countries have become increasingly interdependent and, by 1994, the Riegle-Neal Act had effectively removed the remaining barriers to interstate banking within the United States. Later, the passage of the Gramm-Leach-Bliley Act (GLBA) on November 12, 1999 was

[60] D. Helbing, H. Ammoser, and C. Kühnert (2005) Disasters as extreme events and the importance of network interactions for disaster response management. Pages 319-348. in: S. Albeverio, V. Jentsch, and H. Kantz (eds.) *Extreme Events in Nature and Society* (Springer, Berlin).
[61] K. Peters, L. Buzna, and D. Helbing (2008) Modelling of cascading effects and efficient response to disaster spreading in complex networks. *Int. J. Critical Infrastructures* 4(1/2), 46-62.

enthusiastically greeted as a move towards a more efficient banking system. Based upon an analysis of more than 60 countries differing widely in location and economic development, Barth, Caprio and Levine (2000, p. 26)[62] found that

> "…the tighter the restrictions placed on this [securities] activity... the more inefficient are banks and the greater the likelihood of a banking crisis. The likelihood of a banking crisis is also greater... the tighter the restrictions placed on bank ownership of nonfinancial firms."

They further conclude that:

> "…none of these [securities, insurance, real estate and ownership] restrictions produce any beneficial effects with respect to financial development, nonbank sector and stock market development, or industrial competition. Nor is it found that any of them lessen the likelihood of a banking crisis or enhance bank efficiency."

The crisis has shown how misguided this judgement was. What is needed now is a set of positive measures such as those we have proposed to enable a certain separability of the system. Thus, rather than restricting oneself to strategies which are trying to stabilize the financial system but effectively entail bigger and bigger systemic risks, one should develop suitable decoupling strategies to stop possible cascade and contagious spreading effects.

Currently, the financial system does not seem to have the in-built decoupling strategies (such as reliable "breaking points"), which would allow one to separate affected parts of the system from the rest. In the current system some components become "too big to fail", but as two recent books by Blinder (2013) and Admati and Hellwig (2013) have pointed out, this only incentivises banks to take actions that make the system increasingly fragile. Both argue for regulation to substantially reduce the vulnerability of both the components and the system.[63] Note, however, that the financial system has had a more resilient architecture before. The Glass-Steagall Act had regulations in place, which successfully counteracted systemic problems, until this law was terminated by banking deregulation. It would seem to be necessary to have a modern successor to such regulations. In fact, after the Volker report in the US and the Vickers report in the UK, which both envisage a clearer separation between commercial and investment banks, France was also envisaging similar measures but seems to have retreated to a more passive position.

A separation of banks into commercial banks and investment banks seems to be one reasonable step towards a better decoupling of system components. This should, contrary to the assertions of those in the banking sector, improve the allocation of capital and risks in the financial system. Of course, there would still be a financial exchange between commercial banks and investment banks, but this could be adaptively regulated (and taxed) according to needs, thereby providing central banks with additional control parameters (see Section 4.2). The important point is that banks, whose investments outweigh GDP in some countries, should not have the risks of their trades borne by governments. Whilst commercial banking, which is essential to the functioning of the economy, merits some public insurance, the same argument cannot be made for investment banking. John Kay indicates in his report to the UK government that, in terms of stimulating real activity, the financial sector's role has been, at

[62] Barth, James R., Gerard Caprio, Jr. and Ross Levine. 2000. "Banking Systems Around the Globe: Do Regulation and Performance Affect Performance and Stability?" NBER Conference on Prudential Supervision: What Works and What Doesn't. Islamorada, Florida, January 13-15.
[63] Admati, A. and M. Hellwig (2013), The Bankers New Clothes, Princeton, Princeton University Press. Blinder, A. (2013), After the Music Stopped, New York, The Penguin Press.

best, limited. It is worth quoting Kay at length since he indicates that the build-up of confidence, on which all markets ultimately depend, is far from being the product of simple financial incentives.

> "Financial intermediation depends on trust and confidence: the trust and confidence that savers who invest funds have in those they choose to manage these funds, and the trust and confidence of investors in the businesses they support. Trust and confidence are the product of long-term commercial and personal relationships: trust and confidence are not generally created by trading between anonymous agents attempting to make short term gains at each other's expense.
>
> Trust and confidence, or their absence, are the product of the prevailing culture. Incentives matter: not because, as some people crudely think, financial rewards are the only human motivation – although there are some people of whom that is true, and many of them are to be found in the financial sector. Most people have more complex goals, but they generally behave in line with the values and aspirations of the environment in which they find themselves. We must create cultures in which business and finance can work together to create high performing companies and earn returns for savers on a sustainable basis. These themes – the dependence of successful financial intermediation on trust and confidence, the importance of incentives – are central to this Report. Taken together, rather than separately, they imply a financial world different from our recent experience." [64]

4. Is our current financial system manageable?

4.1. Can competition in one dimension work?

Currently, Europe is facing a serious financial, spending, and political crisis. This crisis still seems likely to endanger the stability of the EURO currency, and it may even challenge the stability of the European Union. The cause of this crisis is generally seen to be the lack of budgetary discipline. This, however, explains only part of the problem. It was, maybe, unavoidable that this situation would sooner or later occur, because of a fundamental weakness in the design of the economic union: it seems logical that competition in a single dimension (the gross national product per inhabitant) will sooner or later lead to winners and losers, and that losers would eventually need help.

It is common practice in economics to reduce complex outcomes to a single variable. Index numbers such as inflation are a mapping of many dimensions to a single dimension, but this is like comparing apples with pears. In doing so, as has frequently been observed, one treats inflation, for example, as if it were the same for everyone. But, of course, those whose expenditure is concentrated on a limited number of goods tend to be affected most. People at or close to subsistence level are primarily concerned with the evolution of food prices and home rents, and the latter are only part of the overall consumer price index.

We consider this desire to reduce measures of economic success to a one-dimensional

[64] Department for Business Innovation and Skills. The Kay Review of UK Equity Markets and Long-Term Decision Making, Final Report, July 2012.

criterion of monetary value to be a fundamental problem. It forces the multi-dimensionality of our world into one single dimension. Recently, however, it is more and more recognised that, for example, measuring the welfare of a nation by its GNP per capita is highly misleading. Indeed the report of a committee led by Joe Stiglitz and Amartya Sen, involving five Nobel prize winners in economics, gives weight to the view that such a simple measure is inappropriate. The commission states specifically,

> "To define what well-being means, a multidimensional definition has to be used. Based on academic research and a number of concrete initiatives developed around the world, the Commission has identified the following key dimensions that should be taken into account. At least in principle, these dimensions should be considered simultaneously:
>
> i. Material living standards (income, consumption and wealth);
> ii. Health;
> iii. Education;
> iv. Personal activities including work;
> v. Political voice and governance;
> vi. Social connections and relationships;
> vii. Environment (present and future conditions);
> viii. Insecurity, of an economic as well as a physical nature.
>
> All these dimensions shape people's well-being, and yet many of them are missed by conventional income measures." [65]

As the report emphasises, what is important is societal well-being and not the monetary value of production. What matters is people's perception of well-being, and this involves many aspects such as people's perception of their absolute and relative situation. Thus, a simple measure, which mixes the monetary value of production and the psychological aspects of well-being, is a highly inadequate criterion. Even apparently satisfactory quantitative measures such as individual wealth in terms of holding financial assets can be influenced by psychological considerations. For example, a breakdown of trust among the participants in financial markets can cause huge market losses in a very short time. (While possibly to the benefit of a few, it generated a rapid decline in the perceived wealth of many individuals.)

Note that attempts to reduce complicated problems to the measurement of one-dimensional indices results in efforts to use monetary incentives for the management of many societal challenges, but these are often ineffective. Monetary incentives or disincentives are used to control many processes in economics and society at the same time: for example, governments try to influence the behaviour of people through various taxes and benefit schemes, and companies through taxes and subsidies. It must be recognized, however, that it is impossible to control many different types of behaviour in this way at the same time. Trying to influence many different behavioural dimensions with just a single variable will typically lead to situations, where improvements in one dimension imply deteriorations in other dimensions. In fact, this problem appears to be quite common and is also mentioned specifically by the Stiglitz-Sen commission. Challenges such as sustainable development are generally not manageable by simple one-dimensional measures.

[65] Report by the Commission on the Measurement of Economic Performance and Social Progress to the French Government April 19th 2009, pp. 14-15, see http://www.citymaking.com/wp-content/uploads/2010/01/19784660-Happiness-and-Measuring-Economic-Progress-by-Joseph-Stiglitz.pdf

Thus, would our economic system be better controllable and more sustainable, if we replaced one-dimensional monetary incentives by multi-dimensional value and incentive systems? The fact that social systems have many different reward mechanisms suggests that this may actually have added value.[66] It is obvious that these different dimensions cannot be freely converted into each other, but they would probably not exist if they would not be favourable for the functioning of social systems. Therefore, it might be beneficial to replace the largely one-dimensional incentive system in our economy by an explicitly multi-dimensional one. In fact, the existence of many currencies and varieties of budget spending rules can be thought of as ways to compensate for the deficiencies of a unified, freely convertible, currency. Moreover, money that is too easily convertible may tempt its users to move their investments around rapidly, constantly searching for the slightest return and thus diminishing longer-term investments.

Introducing multi-dimensional money or value ("qualified money")[84] would be feasible in practice. It may be imagined as being akin to having several different 'bank accounts', but each with different rules and with limited possibilities of conversion. Some of these dimensions would relate to economic capital, but others to "human capital" (such as individual skills), and again others to "social capital" (such as cooperativeness, trust, and other network-based variables that contribute to the fabric of society).

Multi-dimensional criteria would make it possible to influence each single dimension separately, not just their weighted sum. In the simplest case, such influence could be exerted by incentives or sanctions (but there are also more sophisticated mechanisms such as reputation systems). Instruments like these could also be used to adaptively influence *conversions* between the *different* dimensions. Furthermore, such instruments would allow one to decouple the dynamics in different socio-economic dimensions, if needed. From a control-theoretical perspective (see Section 4.2), the system would become better manageable in ways that are compatible with individual decision-making and self-organization of the system.

Note that the approach of multi-dimensional value offers not just *one* way of being successful. It offers *many* ways. In the virtual worlds and economies created by information and communication technologies of the future, it might be possible to realize thousands of different dimensions. Keeping a multi-dimensional indicator means that one can reward the specific contributions of individuals rather than judging them all by the same criterion. This would allow one to make sense of the notion of heterogeneity or "socio-diversity", as we might refer to it. The recognition of the differences between individual contributions is, as it has been argued, the basis on which innovation thrives. In contrast, homogeneity, as it is sometimes promoted by businesses, political systems and academic institutions with the goal of making comparative assessments or standardization easy, can endanger a flourishing socio-economic ecosystem. In this connection, it is important to remember that a rich ecosystem lives on many nutrients and resources, not just one.

4.2. What are the possibilities and limits of management and control?

In Section 1, it was pointed out that complex dynamical systems are difficult to control. That is why regulators have so much difficulty in taming financial and economic systems. This is not

[66] A. P. Fiske, Structures of Social Life: The Four Elementary Forms of Human Relations (The Free Press, 1993).

just a matter of opacity (i.e. a lack of transparency). It also results from the collective dynamics that is characteristic for systems with strongly interdependent components. In fact, while loosely connected systems are characterized by the properties of their components and can be satisfactorily controlled by managing them individually, strongly coupled systems are fundamentally different. They show emergent collective behaviour, which results from the interactions of their components. In other words, the interactions dominate the system behaviour. Feedback effects, network interactions, and counter-intuitive behaviour make complex systems difficult to understand and to manage. In many of these systems, cascade effects and extreme events occur much more frequently than would be expected in systems with less interdependence. Due to interaction-based systemic instabilities, the system behaviour may get out of control even if all system components behave close to optimally (Helbing[12] 2013).

Issues of controllability of systems are studied by the science of cybernetics. Controlling a system requires the ability to measure and influence particular variables of the system, so-called control parameters. In most systems, such as chemical production systems, it is not enough to control *one* variable. System control can be quite subtle, and a lack of certain pieces of information can imply a loss of control.

Recently, the application of control-theoretical methods to networks has attracted considerable attention.[67] The good news is that taming complexity seems to be possible, if the system design is appropriate. The bad news is that this needs sophisticated algorithms to identify the control variables that influence large parts of the system, and also suitable means ("instruments") to influence these variables. Successful system management, furthermore, requires the right kind, amount, and quality of measurement data in real time.

Indeed, in order to be efficient, regulatory institutions need to be able to act globally, to collect all the relevant data required to monitor and judge the state of the system, and to have suitable instruments at their disposal to influence the system dynamics. Today, there is a lack of global institutions, a lack of data (e.g. regarding the mutual interdependencies of companies that might have a systemic impact), and a lack of knowledge regarding possible control variables that would potentially allow one to manage the complex systems humans have built. Moreover, some systems (including the current financial architecture) have evolved in a way that makes a global-scale loss of control quite likely.

However, it would be possible, for example, to create new instruments to reduce excessive volatility in the market dynamics. In this connection, one should evaluate the usefulness of transaction fees (for money transfers between business and investment banking and for financial trading) such as variants of the "Tobin tax"[68]. A more unconventional idea would be to influence the level of fluctuations in stock markets.[69] The latter could be reached by a certain rate of random buy and sell transactions of currencies or assets. This would increase the risk of trading these, thereby reducing the appetite for mere financial speculation. Such and approach would suggest that the pre-crisis "Great Moderation" fuelled greater risk taking.

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[67] Liu, Y.-Y., Slotine, J.-J., and Barabasi A.-L. (2011) Controllability of complex networks. *Nature* **473**, 167-173.
[68] Eichengreen, Barry; Tobin, James; Wyplosz, Charles (1995). "Two Cases for Sand in the Wheels of International Finance". *Economic Journal* **105** (428): 162–72.
[69] Physics for Financial Markets, AlphaGalileo, January 27, 2011, see http://www.alphagalileo.org/ViewItem.aspx?ItemId=94550&CultureCode=en

4.3. Can one promote beneficial self-organization and self-regulation?

The question now becomes: if regulation, as currently defined and practiced, is not suited to control financial and economic systems, how is it then possible to manage their complexity? One may try to find and establish (after previous testing) a set of rules for the various economic stakeholders and their interactions in such a way that it is likely to promote a self-organization towards optimal and stable system behaviour. This would build on the idea of mechanism design (see Hurwicz and Reiter,[70] 2006), and take it further to the level of "integrative systems design",[71] with its particular focus on the emergent properties resulting in complex systems.

Note, however, that small details of interaction rules aiming at better coordination may be quite decisive. For freeway traffic, for example, it has been shown that slightly modifying the interactions between successive vehicles can avoid many traffic breakdowns.[72] Changing the car-following behaviour in certain ways allows one to stabilize traffic flows and, to some extent, even compensate for traffic bottlenecks. In this way, congestion and its negative impacts on environment can be significantly reduced, and annoying increases in travel times even more. Along similar lines it has been argued that limiting high-speed trading would be beneficial for the stability of the financial system. While traffic flowing at maximum capacity on roads might seem to reflect efficiency, it can lead to sudden capacity breakdowns and consequential traffic jams. Measures to limit speed can often be beneficial. A similar approach in financial systems might help to counter recessions and other kinds of economic instabilities.

Analogously, modifying the economic "rules of the game" might have positive systemic impacts (meaning, for example, that markets would indeed become more efficient and that the principle of the invisible hand would work). Let us discuss a simple example on sharing behaviour[73] that illustrates how changing the rules governing interaction can change the outcome: if the person who is supposed to cut a cake is allowed to choose first, he or she will tend to take the biggest piece or even the whole cake. In contrast, if he or she is supposed to take last, this will promote a fair sharing of the cake. In fact, as shown by many experiments, people seem to have a preference for fairness (see Fehr and Schmidt[74] 1999 and the body of work on the "ultimatum game"). Fair behaviour also seems to promote social welfare (Grund, Waloszek, Helbing[51] 2013). Quite generally, symmetrical interactions have a tendency to drive a system towards its optimum,[75] while asymmetries tend to promote local optima and market failures.

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[70] Hurwicz L and S Reiter (2006) *Designing Economic Mechanisms*, Cambridge, Cambridge University Press.
[71] Helbing, D. and Balietti, S. (2011) From social simulation to integrative systems design. *EJP Special Topics* **195**, 69-100.
[72] A. Kesting, M. Treiber, M. Schönhof, and D. Helbing (2008) Adaptive cruise control design for active congestion avoidance. *Transportation Research C* **16**(6), 668-683.
[73] Carvalho, R., Buzna, L., Just, W., Helbing, D., and Arrowsmith, D.K. (2012) Fair sharing of resources in a supply network with constraints. *Phys. Rev. E* **85**, 046101.
[74] Fehr, E. and Schmidt, K.M. (1999) A Theory Of Fairness, Competition, And Cooperation, *The Quarterly Journal of Economics* **114**(3), 817-868.
[75] Helbing, D. and Vicsek, T. (1999) Optimal self-organization. *NJP* **1**, 13.

5. Do companies and banks really maximize their benefits?

5.1. Can coordination and cooperation fail spontaneously?

One might expect that financial institutions, like any other privileged institution in our society (such as political parties, religions, etc.), should benefit society, and not exploit it. If an institution fails to perform its function properly, it makes sense to reform or replace it. In the case of the economy, it is time to revise the more than 300 year old paradigm of the 'invisible hand', according to which, when every market participant acts selfishly in his or her best interest, this will also improve social well-being. In fact, scientific studies show that, even for an idealized coordination problem (where people have to decide between two or more alternatives and would benefit from a consensus), a system-optimal solution is not obtained when there are network interactions and transaction costs.[76] The situation is even worse in social dilemma situations. There, everybody does very well if everyone cooperates, but any single individual is even better off by *not* cooperating, while the others do so. In other words, in social dilemma situations there is a temptation to be non-cooperative (a "free rider"). Consequently, there is a tendency for cooperation to erode. The logical consequence is a so-called "tragedy of the commons" (Hardin[77] 1968), where everybody ends up in a situation that is much worse than if everybody cooperated. Such tragedies can be overcome and cooperation restored by a number of mechanisms. These mechanisms include repeated interactions, reputation mechanisms, sanctioning of non-cooperative behaviour, and local neighbourhood interactions.[78]

When regional interactions are replaced by global interactions, or if the interaction network in the system becomes too dense, cooperation may be endangered (see Dalton and Rohrschneider[79] 2002; Helbing[12] 2013). The expected result is a self-destabilization of cooperation. Similar destabilization phenomena are observed, when fluid traffic flows break down, or if orderly pedestrian flows turn into crowd disasters. It is likely that transforming the banking system from a regional organization into a "global financial village" was a root cause of the financial crisis. In fact, the banking network became more and more tightly connected in the decade before the financial crisis (see Haldane[80] 2009). Complementary to this we would like to mention the work of Nobel Prize winner Elinor Ostrom, which suggests that a decentralized, local decision-making can lead to better outcomes, if properly organized (see Ostrom *et al.*[81] 2010).

Our globalized financial and economic system instead seems to have created various "tragedies of the commons". For example, the global trading of goods produced under lower social and environmental standards than required in Western countries has poisoned the environment around the production sites even though these sites may be producing for international firms who, in their own countries have to respect higher standards. Furthermore,

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[76] C.P. Roca and D. Helbing (2011) Percolate or die: Multi-percolation decides the struggle between competing innovations. Preprint http://arxiv.org/abs/1101.0775. See also: D. Helbing, Social Self-Organization (Springer, Berlin, 2012).
[77] Hardin, G. (1968). "The Tragedy of the Commons". *Science* **162** (3859): 1243–1248.
[78] D. Helbing and A. Johansson (2010) Cooperation, norms, and revolutions: A unified game-theoretical approach. *PLoS ONE* 5(10), e12530.
[79] Dalton Russell and R Rohrschneider (2002) A Global Network? Transnational Cooperation among Environmental Groups. *Journal of Politics* **64**(2), 510-533.
[80] Haldane, A. (2009) 'Rethinking the financial network', Speech delivered at the Financial Student Association, Amsterdam.
[81] Ostrom E, Amy R. Poteete and Marco A. Janssen *Working Together: Collective Action, the Commons, and Multiple Methods in Practice*, with Princeton, NJ: Princeton University Press, 2010.

in many Western countries, globalisation has endangered reasonably paid jobs and weakened the social benefit systems (if any), since there are currently no mechanisms by which those who gain from cheaper imports compensate those who become unemployed. This has also damaged the social fabric on which our societies are built (e.g. social capital like cooperativeness and trust).

Another emergent problem seems to be that food, water and other essential resources increasingly become unaffordable for the poorer inhabitants of the world, even though most of these resources could be available in sufficient quantities. This is in part due to increasing demand from emerging countries, in part due to financial speculation, but also due to climate change and biofuel production trying to confront it. Financial speculation has, to a large extent, been in commodity futures and has produced significant spikes in the prices of agricultural products recently. These developments may deprive people who used to own the same resources (e.g. land) before, thereby creating social and economic problems rather than reducing them. A striking example of this is the large-scale purchases of agricultural land in Africa by other countries, increasing the dependency of the local population (see Castel and Camara[82] 2009).

5.2. Are the ethically behaving ones always the stupid?

In our current economic system, it appears that moral behaviour is costly. Therefore, it is expected to disappear due to the pressure of evolutionary competition ("survival of the fittest"). It seems that we cannot afford ethical behaviour, as it reduces the set of behavioural options and puts people trying to meet ethical standards at a disadvantage compared to others, who do not put such constraints on their actions.

However, many market participants may be willing to submit their decisions to ethical rules, if the same constraints are imposed on all the others. Such a system would be fair in the sense that the same rules would apply to everyone. In a society where the same people interact with each other continually, norms can be sustained and cooperative behaviour can be the standard. However, there is a realistic danger that such an equilibrium may be undermined by the temptation to "free ride" on the good behaviour of others. Nevertheless, as is well known from the "folk theorem" of game theory, if people interact regularly with each other, a sanctioning of non-compliant behaviour might sustain the norm.

If taken literally, without the caveats Adam Smith imposed, the principle of the 'invisible hand' suggests that it would not be beneficial for our economy to put any constraints on individual actions. But is this really true? For the case of social dilemmas (see Sec. 5.1), it has been demonstrated that individual profit maximization neither guarantees an optimal systemic outcome, nor optimal individual results (Hardin[77] 1968). However, recent scientific results show that cooperative, fair and friendly behaviour can significantly outcompete behaviour that tries to maximise individual profits (Grund, Waloszek, Helbing[51] 2013). This can happen if cooperative, fair or friendly individuals predominantly interact among each other and avoid interactions with selfish individuals. An important objective then is to work towards the establishment of an ethical code for the economy (such as the Hanseatic business honour), to promote friendly, fair, and responsible action.

[82] Castel, V., and Kamara, A., 2009, Foreign Investments in Africa's Agricultural Land: Implications for Rural Sector Development and Poverty Reduction, *African Development Bank Development Research Brief*, Number 2.

To this end, one might create an independent international participatory reputation platform that collects ratings, opinions and complaints. This platform could conduct surveys and collate and publish information on companies, products, banks, bankers, politics and politicians, and every type of organisation, including the current financial rating agencies. Reputation is one of the mechanisms which can stabilize cooperation in social dilemma situations even in a globalized world.[83] In fact, the spreading of commenting and recommender systems shows that users consider such evaluations useful, and in many fields such evaluations are now published by organisations – from consumer protection groups to non-governmental organisations such as Human Rights Watch. What individuals need is information on trustworthiness. Platforms like *eBay* make it possible for users to identify those who have predominantly made fair transactions in the past. As recent studies show (Przepiorka[84] 2013), such an information feedback can promote a trustable and more profitable exchange. Note, however, that evaluation mechanisms and recommender systems should be implemented in a differentiated way, on a multi-criteria scale (see the discussion of deficiencies of systems with one-dimensional competition in Sec. 4.1). Such a multi-dimensional public evaluation system should help to promote a flourishing and self-regulating 'socio-economic ecosystem'.

Summary

In conclusion, we have created a strongly coupled and strongly interdependent world, which poses new challenges. While it is probably unrealistic and undesirable to dismantle the level of networking and globalization we have reached, there is a great potential to develop new management approaches for our complex world based on suitable interaction rules, favourable institutional settings, and novel adaptive concepts (including temporary decoupling strategies similar to circuit breakers), based on real-time monitoring and measurements.

Nevertheless, it must be emphasised that our current financial and economic problems cannot be properly addressed by remaining within the current mainstream economic paradigm. We need to change our perspective on the financial and economic system and pusue innovative policies. We would like to make the following recommendations:

1. to make large-scale investments in new economic thinking (as INET has already started to do), particularly multi-disciplinary research involving knowledge from sociology, ecology, physics, and cybernetics; in this connection, we particularly emphasize the need of a theory of "networked minds" to describe the behaviour of a "homo socialis" characterized by other-regarding behaviour (Grund, Waloszek, Helbing[51] 2013);
2. to divert a certain share of the profits generated in the financial sector into research and other activities destined to improve social well-being;
3. to support diversity in the system, responsible innovation, and multi-dimensional competition;
4. to require advance testing of financial instruments and innovations in order to avoid, as much as possible, undesirable systemic impacts (e.g. a destabilization of the financial system) by setting institutional constraints;
5. to develop new measurement concepts and adaptive feedbacks via suitable "control parameters", which allow one to make markets function better and to serve their

[83] M. Milinski, D. Semmann, and H.-J. Krambeck, Reputation helps solve the 'tragedy of the commons'. Nature 415, 424-426 (2002).
[84] Przepiorka, W. (2013) Buyers pay for and sellers invest in a good reputation: More evidence from eBay. *The Journal of Socio-Economics* **42**, 31-42.

original purpose;

6. to create new indices to guide political decision-making, which consider environment, health, social capital, and social wellbeing;
7. to identify and establish a proper institutional framework for interactions (suitable "rules of the game") in order to facilitate beneficial self-organization;
8. to adjust the perspective of our world to the fundamentally changed properties of the globalized, strongly interdependent techno-socio-economic-environmental system humans have created and its resulting complex, emergent dynamic system behaviour;
9. to recognize the value of local and regional interactions for the creation of social capital such as cooperativeness, fairness, trust, etc., which are an important factor of economic value generation;
10. to implement better incentive systems to foster more responsible action and to establish, for this, a universal, decentralized and independent reputation system to promote fair behaviour and allow ethical behaviour to survive in a competitive world;
11. to develop new tools to facilitate the assessment of likely consequences of our decisions and actions (the "social footprint"). These tools may, for example, include (Helbing[12] 2013):
    - a "Planetary Nervous System" to enable collective awareness of the state of our world and society in real-time, which would mean to have a detailed and constantly updated picture of the economic and social system at every point in time,
    - a "Living Earth Simulator" to explore possible and likely consequences of human decisions and actions,
    - a "Global Participatory Platform" to extend opportunities for social, economic and political participation,
    - an "Open Data Platform" to foster creativity, an "innovation ecosystem", and the creation of new business opportunities,
    - a trustable Web and reputation system to facilitate safe and fair exchange, and
    - information and communication systems supporting value-oriented interactions.

In summary, the socio-economic system envisaged in this paper is characterized by the following features:

1. it is based on individual decisions and self-organization,
2. it uses suitable incentives to support sustainability and to avoid coordination failures, tragedies of the commons, as well as systemic instabilities,
3. it recognizes heterogeneity and diversity as factors promoting well-being, innovation, and systemic resilience.

The concepts in our paper are further elaborated and formalized in a recent manuscript.[85]

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[85] D. Helbing, Economics 2.0: The natural step towards a self-regulating, participatory market society, Evolutionary and Institutional Economics Review, in print (2013), see http://arxiv.org/abs/1305.4078

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The fate of Keynesian faith in Joseph's countercyclical moral

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Into the fifth year of the Great Recession the scarcity of jobs in Europe and the US continues to condemn tens of millions of us to suffer a hard life of involuntary unemployment, underemployment, and insufficient wages. One would hope that any future political agreements made to mend the fiscal health of the nations would not worsen this scarcity, but lead directly to solving it. A crucial way to accomplish this would be for our leaders to reassert their faith and confidence in the primary efficacy of economics' countercyclical principle in fashioning these agreements. After all, thousands of years of evidence prove the overwhelming effectiveness of the countercyclical moral, that jobs, fiscal health, and prosperity are best grown and sustained by spending in times of scarcity, and saving in times of plenty.

According to the biblical legend,[1] the countercyclical moral was suggested to Pharaoh by a Hebrew named Joseph after Pharaoh was disturbed by two dreams. The first dream concerned seven fat and seven scrawny cows, and the second about seven full and seven withered ears of corn. In both the lean ate up the fat. That there were two dreams made the moral all the more insistent, and the consequences all the more potentially catastrophic if not heeded.

Pharaoh called upon Joseph, a celebrated diviner of dreams. After listening to the dreams Joseph told Egypt's supreme ruler that his people were about to experience seven years of plenty, followed by seven years of famine. Without a pause Joseph went on to suggest that Pharaoh set aside a fifth of the produce of the land during the years of plenty so that the people could survive the famine. Enlightened by Joseph's rare familiarity with dreams, as well as his sound economic advice, Pharaoh promptly realized there was no man more evidently discerning and wise before him than Joseph, so he installed Joseph as his second in command, the Chancellor of the realm, especially to carry out the stated policy. As the legend is told, then, Pharaoh's faith in Joseph's countercyclical moral saved the Egyptian nation and Israel's ancestors, thus the future of our Jewish, Christian, and Islamic Abrahamic heritages.

Today we face an economic problem which is a bit more sophisticated than agricultural husbandry as it was four thousand years ago or so. Happily, Joseph's countercyclical moral is ubiquitously curative because old-fashioned fear and greed rule the outcome of any economy's central question: How can we save ourselves through continuous times of plenty and scarcity?

It is not difficult to imagine that without Joseph's wisdom it is likely that our usual herd behavior would have prevailed in ancient Egypt by following a political script as old as the economic surplus. Compelled by their greed, Pharaoh and his rich and powerful retinue most likely would have kept the plenty to themselves no matter what the economic conditions, or costs, by skillfully manipulating the fear of the many, and above all by clinging to the power to control all resources. The father of modern economics, Adam Smith, thought this herd

[1] Genesis, chapter 41

dynamic so commonplace that he took it for granted: "Civil government," he said, "so far as it is instituted for the security of property, is in reality instituted for the defence of the rich against the poor, or of those who have some property against those who have none at all." No doubt the rich, and their "little nobility," [2] as he put it, would have justified their behavior as necessary for the nation's survival because the wealth of the "jobs creators" obviously over time trickles-down to the many, thus creating and insuring their and their children's very livelihoods.

But Smith would have none of this tiresome rationalization for the oppression of the many by the few. Instead, witnessing on the pages of The Wealth of Nations to the unparalleled wealth accumulating in places like England and colonial America, he was convinced that it truly emerged from the bottom, up: "The natural effort of every individual to better his own condition, when suffered to exert itself with freedom and security, is so powerful a principle, that it is alone, and without any assistance, not only capable of carrying on the society to wealth and prosperity, but of surmounting a hundred impertinent obstructions with which the folly of human laws too often incumbers it operations; though the effect of these obstructions is always more or less either to encroach upon its freedom, or to diminish its security."[3] All we need to rise, then, from bare necessity or less is a level playing field, like a colonial America that was hungry for workers, or a new New Deal, perhaps. Otherwise we get the default effects of the old herd.

Today we call this sort of benighted, undemocratic, and unmitigated herd behavior Social Darwinism. To say the least, it is spurious, and self-defeating. In the end the unmitigated greed of the few eats up so many stores of wealth that, Midas-like, it finally runs out of objects upon which to feed, and so the livelihoods of the people wither and slump, eventually to die. No wonder the moral of many biblical stories rail against greed, and biblical prophets like Isaiah declare that "the wealth of nations"[4] depends ultimately upon their continuous provisions for the nurturance of their poor. Indeed, only a nation's exceptional regard for the welfare of its poor merits its exceptional wealth, and designation.

Not long ago a modern economist named John Maynard Keynes rediscovered the countercyclical wisdom of preparing for the worst during the good times, and using that plenty to spend during the hard times. We have been debating his legacy with renewed vigor for the past 30 odd years, ever since we (if I may focus now on the US, representatively) allowed the interminably powerful few to decouple the getting of their wealth from the wealth of the many by skimming off more and more of the nation's productivity gains.[5] The resulting spikes of inequalities in wealth, income, and opportunity remains a national shame. Just after President Richard Nixon declared, "We're all Keynesians now," we slowly but surely allowed the powerful few and their "little nobility" to again redirect their "Dominators' hoards," as Keynes put it, to threaten the poor with a "system [that] could be in equilibrium with less than full employment."[6]

For the past 30 plus years, then, pre-New Deal, inhumane, trickle-down policies have been re-imposed upon the US with Orwellian ingenuity: for example, any mounting total debt or

[2] Smith, Adam. 1776, 1994. *An Inquiry into the Nature and Causes of The Wealth of Nations.* New York, The Modern Library. pp. 770-771
[3] Ibid., p. 581
[4] Isaiah, chapter 66, verse 12
[5] Baker, Dean. 2009. *Plunder and Blunder.* PoliPointPress, Sausality, CA. pp. 13-14.
[6] Keynes, John Maynard.1936, 1964. *The General Theory of Employment, Interest, and Money.* San Diego, New York, London, A Harvest Book, Harcourt Brace & Co., p. 243.

annual deficit is inherently "bad" for the future livelihoods of our children (not mentioned that spending on capital improvements and education during a slump leaves our children more assets[7]); non-living-wages are considered "good" (rationalized in comparison with having no wages at all); and "involuntary unemployment" once again does not exist, using Keynes' words, simply because "classical theory does not admit [it]."[8]

Meanwhile, the country's fiscal well-being is continuously strangled and held hostage over the principle that increased taxes on the rich would be counterproductive to economic growth, all the while the record of less and less taxes on them has proven that principle wrong.[9] Indeed, this mantra has been touted by the rich and powerful for so long that they have succeeded in convincing nearly half the population that a plutocracy of, by, and for the few is nothing less than a public service. To be fair, it must be noted that acquiescence to fabrications of this sort has long been reinforced by the fears driven by the complementary strategy of divide and conquer: for example, there are those who deserve to be America's "little nobility," and there are those whose birth certificates must be questioned; there are those who are lucky to have jobs, and there are those whose jobs may disappear if complaints are heard.

Like Joseph, Keynes was known to have a heart full of prescient understanding. Keynes argued against the Treaty of Versailles after WWI, that its austere economic consequences would lead not only to gratuitous, punishing hardship for Germany, but disaster for Europe. Unlike old Pharaoh, not many leaders heeded the warning, and the imposed austerity mightily contributed to all the disasters during WWII. Nevertheless, Keynes' General Theory did leave us the basic theoretical structure for our modern economic world, one which meshed with and guided the New Deal. Much of this work is a complicated mathematical stew of the usual economic subjects of business cycles, employment, wages, savings, interest rates, deficits, and the like, but its two basic principles are Josephian.

The first is the primacy of "effective demand," that is, like in Joseph's moral, everyone's employment and access to the economic pie is necessary for the national economy as a whole not only to function well, but to survive in the long run at all. In this, Keynes is Smithian: the economy works primarily from the bottom up, not the top, down. As the sometimes enlightened jobs creator, Henry Ford, once divined (like Keynes), workers and consumers are not separate populations, but one and the same. So Ford paid his workers the then unheard of wage of $5 a day. He just wanted them to be able to buy his cars. Unfortunately, his competitors would not match his free-thinking ways, and so the economic "equilibrium" persisted at default, "with less than full employment".

One would think that such a glaring and fundamental lacuna in the definition and dynamics of the economic market would have been mended in economic thought and business practice by now, but it has not. Instead, it continues to lead both to the worship of a person's consumer needs, and to the exploitation of that same person's dependency upon work. In psychotherapy we call this dysfunction. Narcissistically-driven double messages like this

[7] For an example of how "bad" debt is for our children, see Michael Boskin, September 23, 2009, "The Government Debt Bomb," Project Syndicate. www.project-syndicate.org/print/the-government-debt-bomb. For a rejoinder see, Robert Skidelsky, January 20, 2012 "Does Debt Matter?", Project Syndicate. www.project-syndicate.org/print/does-debt-matter.

[8] Keynes, 1936, p. 15. For examples of conservative talk on wages and on whether "involuntary unemployment" exists or not, see Casey B. Mulligan's blogs, August 17, 2011, "Exceptions to Keynesian Theory," and, November 14, 2012, "What Job Openings Tell Us," The New York Times.

[9] Thomas L. Hungerford, September 14, 2012, "Taxes and the Economy: An Economic Analysis of the Top Tax Rates Since 1945," Congressional Research Service

infect intrapsychic and family systems with hurt, anger, and chronic instabilities, including mental disorders, rebellion, mutiny, revolt, insubordination, coup, and anarchy.

A more mature capitalistic system might start and end with an appreciation of the whole person, as in perhaps treating everyone primarily as a capitalist by instituting a living wage, actual full employment economy. This would allow, on the one hand, for the creative destruction of horse and buggy businesses and jobs. Yet on the other, sustained entrepreneurship could be nurtured on a permanent, level playing field for workers, consumers, and employers alike, with everyone made better off by guaranteeing as full a market as possible at any given time.

Keynes' second principle is based on the first, and demonstrates how to imagine an actual full employment economy might perpetuate itself via the countercyclical principle: that the "The right remedy for the trade cycle is not to be fund in abolishing booms and thus keeping us permanently in a semi-slump; but in abolishing slumps and thus keeping us permanently in a quasi-boom."[10] In other words, like in ancient Egypt, to save the fear and greed of the few from stifling the effective demand of the many, government must step in and save during the boom, in order to spend during the slump, until the capital of cows and corn and whatever starts to fatten up again, ending the slump.

But that takes a lot of faith in Joseph's original dream interpretation, and the economic policy prescriptions that followed, does it not? What happens when the stores of capital seem to dwindle to too little to feed the many? Can one really trust that the famine would last just seven years? Who is this Joseph (or Keynes), anyway? Better to listen to and follow our traditional and immediate "jobs creators"?

Or, in a modern economy, what happens when the accumulation of total debt and annual deficit makes money-holders doubt the value of their investments? That too takes a lot of Josephian faith to continue to drive stimulus, does it not? Wouldn't the slump be accelerated by the debt and deficit caused by the lack of confidence of those well off seeking to consolidate their holdings into more liquid assets? Before that happens, shouldn't we pull back on public spending lest we "crowd out" private investments?[11]

Unfortunately, such a self-fulfilling prophecy is the present standard for public, fiscal confidence. It arbitrarily sets the tipping point of an imposed austerity for the many by the fear and greed of the few in order to protect their assets. As the then President of the European Central Bank, Jean Claude-Trichet, put it on July 22, 2010 in a deciding moment for Europe, and America: "In extraordinary times, the economy may be close to non-linear phenomena such as a rapid deterioration of confidence among broad constituencies of households, enterprises, savers and investors. My understanding is that an overwhelming majority of industrial countries are now in those uncharted waters, where confidence is potentially at stake. Consolidation is a must in such circumstances."[12]

Since this sort of pivot inexorably leads to increased involuntary unemployment, underemployment, and insufficient wages for millions of people around the world, Mr. Trichet's definition of the "broad constituencies" whose "confidence is potentially at stake" is

[10] Ibid., p. 322
[11] Boskin, 2009
[12] Trichet, Jean-Claude. "Stimulate no more—it is now time for all to tighten," *Financial Times,* July 22, 2010. (Via Paul Krugman's blog, "Jean-Claude and the Invisibles," *The New York Times,* July 23, 2010.)

somewhat discriminatory. Indeed, it is merely a rationalization for a loss of Keynesian faith in countercyclical spending; thereby an excuse for a rather significant sacrifice of millions of livelihoods. It is like suddenly becoming afraid of the flow of the river while crossing it in midstream after being warned (in a dream?) not to lose the momentum of movement to the far bank. Josephian faith is a tall order; nonetheless, it is crucial for life.

This, then, is our plight as created by the few: we are perennially scared into taking our eyes off the other side of the river, the goal of sustained full employment for the many. This is done simply in order to secure dominators' immediate, greed-based confidence in their debt and burgeoning hoards. And the fundamental method used manipulate the herd into doing its bidding is this: unenlightened Pharaohs fear-monger using racism, xenophobia, employment fears and whatever else may work to scare the workers and consumers we call citizens away from realizing their Josephian role as the originators of the economic order itself.

To this, Joseph's countercyclical moral asks, what worth is the dominators' ultimate confidence in the safety of their assets if the many can't survive, if the center of the whole cannot hold? In this light, is not faith in the countercyclical moral just commonsense? As Keynes re-demonstrated, then, not austerity but only continuously nurtured faith in effective demand sustains the widespread confidence of job makers and citizens alike who combine to make prosperity's virtuous circle.

So, where does this presently leave us, when not only are all of us not being saved by our economic policies, but from our political leaders on down we've seemed to have lost the collective faith in how this is done? It's as if we've gotten amnesia, as if the New Deal and the post-WWII productive surge in the developed world that ensued from its Keynesian principles were a blissful mirage when the median wage doubled—as never before or since—from 1947 to 1973.[13] Yet, in truth it is not a mirage that the US's present wealth—measured by its total stock of natural, human and physical capital[14]—is presently humongous. Moreover, its productive capacity is vastly underutilized, and the fulfillment of that capacity only awaits the creation of the jobs and wages that stimulate the effective demand and virtuous circle that keeps us in a "quasi-boom". Back during the Great Depression, as FDR regularly preached, total capital, growth, and accumulating prosperity can easily pay down any prudent debt we incur during the slump, and thereby restore fiscal balance.

That did happen. Even though the ratio of our gross domestic product to debt was the highest ever in US nation's history just after WWII, we went on to increase the debt with the G.I. Bill for ourselves and the Marshall Plan for our European sisters and brothers. The productive capacity that that massive stimulus unleashed, combined with our collective savings, capital improvements, and high taxes on the wealthy, slowly but surely paid off the debt, and brought it down to untroubled levels in the years ahead until it reached its nadir in 1974. And no one's child was hurt by the debt, for it functioned simply like a payment we made on insuring a sensible future via the monthly rent, or mortgage. And during these years even those habitually given little of the economic pie via racial segregation and sexism instead secured more and more, alongside the facts we welcomed immigrants galore, and wages blossomed. Again in history, Joseph's countercyclical moral worked well enough to save a few nations, and their peoples' heritages.

[13] Paul Krugman, "The Twinkie Manifesto," The New York Times, November 19, 2012, p. A21.
[14] International Human Dimensions Programme on Global Environmental Change, "Inclusive Wealth Report, 2012"

Most remarkably, Keynes' "analysis," as he put it, "supplies us with an explanation of the paradox of poverty in the midst of plenty".[15] As if heeding the biblical injunction, "There shall be no poor among you,"[16] Keynes' General Theory completely upends our commonplace experience of this ageless human paradox—and sin—by providing us with the macroeconomic tools to steer clear of systemic poverty by means of the permanent "quasi-boom." In short, Keynes gave us the tools to solve the economic problem itself:

> "[T]he *economic problem* may be solved, or be at least within sight of solution, within a hundred years. This means that the economic problem is not—if we look into the future—*the permanent problem of the human race.*
>
> Why, you may ask, is this so startling? It is startling because—if, instead of looking into the future, we look into the past—we find that the economic problem, the struggle for subsistence, always has been hitherto the primary, most pressing problem of the human race—not only of the human race, but of the whole of the biological kingdom from the beginnings of life in its most primitive forms"[17] (emphasis original).

Yes, Joseph's countercyclical moral is potentially that miraculous. It is as if we have at our fingertips the fate of a new birth of liberty every bit as momentous as that from chattel slavery: freedom as much as is humanly possible from the economic problem itself.

So, since we're still caught in the paradox of having both a scarcity of living-wage jobs and the wherewithal as nations to stimulate job creation—even government as employer-of-last-resort jobs!—then it is our Josephian responsibility to do so in order to save livelihoods now, as well as the full productive capacity of our nations for our future generations. Otherwise, they may wither and slowly die as we persist in being deluded by unenlightened Pharaohs who preach that the primacy of greed for the "jobs creators", and the imposition of austerity for the rest of us, must come before effective demand is satiated enough to sustain a "quasi-boom".

In fact, the imposition of austerity during a slump is arrogance of Biblical proportions, the true, exploitative beginning of all "class warfare," and, hence, revolution, warfare, and national disaster as we saw from WWI through the end of WWII. Just witness the racism, xenophobia, and organized groveling to the "jobs makers" now alive in the US, and in Europe, fed continuously by Pharaoh wannabes and their "little nobilities," fueling policies recklessly demolishing peoples' livelihoods on an Orwellian altar of "The Government Debt Bomb" to use one economist's fear-mongering, pitiless phrase.[18]

Instead, let us reassert our collective faith in Joseph's countercyclical moral and its virtuous heritage, and continue to reapply it now with jobs' stimuli and increased taxes on the wealthy, and then sit back, and watch our children be saved, and rise, hopefully in full sometime before Keynes' goal of 2028.

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[15] Keynes, 1936, p. 30
[16] Deuteronomy 15:4
[17] Keynes, John Manyard. 1928, 1930, 1972a. "Economic Possibilities for our Grandchildren." *The Collected Writings of John Maynard Keynes, Volume IX, Essays in Persuasion,* London, Macmillan, St. Martin's Press, pp. 326-7
[18] Michael Boskin, September 23, 2009, "The Government Debt Bomb," Project Syndicate. www.project-syndicate.org/print/the-government-debt-bomb.

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A constructive critique of the Levy Sectoral Financial Balance approach: resurrecting a "Robin Hood" role for the state's taxing-and-spending functions

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Abstract
This paper revisits the Sectoral Financial Balance approach distinguishing between its usage by the Levy Economics Institute as a macro forecasting tool and by Modern Monetary Theorists as an accounting framework for justifying theoretical claims. As a forecasting tool the approach has been praised for connecting financial flows to the likely balance sheet implications and for providing clear warning of the credit crisis. That its practitioners alter standard terminology and interpret shifts in the three main sectoral balances in a stylised manner to suit "a model of aggregate demand" has also sparked recent debate. The approach need not but appears to lend itself to overstating the role of the government sector and to framing policymaking advice through a "budget deficit lever" prism. The paper also queries the claim by the deficit owls that "fiscal receipts cannot be spent" on the grounds of empirical relevance and because it sustains a view where higher budget deficits lead to better outcomes to the neglect of a rejuvenated taxing-and-spending role for the State.

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Introduction

> "The central contention of this paper is that, given unchanged fiscal policy and accepting the consensus forecast for growth in the rest of the world, continued expansion of the U.S. economy requires that private expenditure continues to rise *relative to income*... [It] seems impossible that this source of growth can be forthcoming on a strategic time horizon... [but if it were] to continue for another eight years, the implied indebtedness of the private sector would then be so extremely large that a sensational day of reckoning could then be at hand." W. Godley (1999, p. 5)

In the build-up to the crisis that began in mid-2007 the Levy Economics Institute cautioned that the "drivers" of aggregate demand in the United States were configured in an unsustainable fashion, at least over a strategic time horizon. Attention was drawn to the excess of private expenditures over disposable income from 1997 until 2007 and to the econometrically-implied rate of debt uptake by the nonfinancial private sector. This line of analysis was perhaps best exemplified in Wynne Godley's (1999, 2000, 2005) work utilising the Sectoral Financial Balance (SFB) approach. The SFB approach, known also as "New Cambridge", is an *ex post* accounting identity derived by rearranging the components of aggregate demand and typically presented as a three-sector model comprising the private, public and foreign sectors. It is an important identity insofar as it links aggregate demand with changes in sectoral net financial asset positions. The framework informs the Levy macro model which is in turn acclaimed as one of the few macro models that provided lucid forewarning about the mechanisms and timing of the credit crisis; hence, part of the reason for the intrigue here.

The analysis proceeds as follows. Section one argues that the SFB approach is quite useful for forecasting purposes but less so as a model of aggregate demand. Section two traces the shift in the Levy Economics Institute Strategic Analyses from a fairly cautious deficit dove position in the early- to mid-2000s to a deficit owl position. This shift may reflect the severity of the "Great Recession" or rising influence of Modern Monetary Theorists (MMTers) or both. It is argued that SFB adherents do tend to frame their policy prescriptions in terms of a "budget deficit lever" prism and in doing so relegate important issues to the background. Section four queries the level of determinacy that the deficit owls assign to budget deficits in the macroeconomic process. Section five lends support to those in heterodoxy who argue that reflating the US economy while keeping public debt volumes on a "desirable" longer-term path requires progressive taxation reforms and a reorientation of government expenditures to more socially-productive purposes with high multiplier effects.

1. The SFB approach: a useful but partial lens

> "[It is widely held that 'no one saw this crisis coming' but some did.] Take, for instance, Wynne Godley ... From 2000 he had consistently argued that a US housing market slowdown was unavoidable in the medium term, and that its implication would be recession in the US." D. Bezemer (2009, p. 4)

In the Levy Strategic Analyses published bi-annually the accent in the build-up to the current crisis was on the "unsustainable" configuration of US growth "drivers" in the form of persistently large private sector and current account deficits. The late Wynne Godley has received fitting kudos for his prescient assessment of the macro trends which culminated in the "Great Recession". Marc Lavoie recounted in an interview (Pilkington, 2012) that Godley used the SFB identity for three purposes: (1) to check the consistency of assumptions in official macro forecasts; (2) to assess the sustainability of any configuration of sectoral financial balances; and, (3) as a model of aggregate demand. It is the latter usage which Lavoie has reservations about and which will receive attention below. The line of inquiry focuses on examining how certain terminological choices and stylised interpretations of shifts in the three main sectoral balances, in turn, influence thinking on the policymaking front.

Unlike most Levy scholars I will not invert the financial balances (FBs) of any sector for reasons of conceptual clarity: it is much easier to grasp at the intuitive level what a FB portends for any sector when a positive or negative FB (i.e. surplus or deficit) is recorded under the same sign. Usually, the US private sector runs a surplus around 2% of GDP, but from the start of 1997 through to the end of 2007 it was mostly in deficit, averaging -2.4% of GDP. Godley (1999, p. 3) drew attention to what was an ominous and unprecedented development in the US economy as follows: "The descent of the private sector into financial deficit means that the sector as a whole has become a net borrower (or a net seller of financial assets) on a record and growing scale." Zezza (2009, p. 19) offers a similar view in his summation of how the SFB approach can be developed along three different lines:

> (1) [A] positive balance implies that, for that sector, injections exceed leakages, so that that sector is a net contributor to aggregate demand...
> (2) Movements in the balances signal an increase (decrease) of injections against leakages ... [and,]
> (3) Financial balances imply an accumulation of net financial assets. Whenever a balance is in negative territory, it can thus be interpreted as the net increase in debt.

Observe that with the general government FB redefined as a deficit and given a positive sign, the private FB inverted, and the foreign FB viewed as the US current account, one can make limited sense of points (1) and (2) but not point (3). A positive FB is equated in point (1) to an excess of "injections" over "leakages" (i.e. the sector is spending more than its income) and then in point (3) to an "accumulation of net financial assets". How can a sector accumulate net financial assets if it is deficit-spending? Moving past the questionable inversions of FBs I am not sure what to make of Zezza's (2009) point (1) and will reinterpret his idea in line with point (2) such that a downward shift in a sector's FB signals that its "net contribution" to aggregate demand is increasing.[1]

Consider that the main driver of aggregate demand is autonomous growth in private expenditures (consumption and investment) and disposable income but that this dynamic is all but invisible to a "net contribution" lens. Suppose that a $100 increase in private expenditures is associated with an extra $100 of disposable income in one situation and $99 in another situation. A "net contribution" lens implies that the private sector's contribution to growth in aggregate demand was zero in the first situation and $1 in the second situation when in both instances it was $100. Conversely, if a $10 increase in public sector deficit-spending generates an additional $10 of disposable income for the private sector, the full amount will be taken as "net driving" aggregate demand. There are surely better ways to proxy the contribution of the private sector to aggregate demand (say, by the growth rate of private expenditures net of income transfers from other sectors).

MMT scholar, Scott Fullwiler (2009), extends the SFB approach into a model of aggregate demand that is reminiscent of the IS-LM figure. His figures have surplus/deficit on the horizontal axis and output on the vertical axis; and, record the intersection point between the private FB and the sum of the government deficit and current account. There are three issues here. Firstly, the main source of growth in aggregate demand and national income (of which saving is the unconsumed portion) is neither the public nor foreign sector but transactions within the private sector, but these "net out" in Fullwiler's diagrams for reasons already discussed. Secondly, if the model of aggregate demand is intended to inform theory, then it should consider the array of intra-private sector variables which Godley (1999, p. 12) bypassed to make the SFB identity useful as a parsimonious means to query the medium-term plausibility of 'official' estimates for economic growth and the government budget:

> "The central point in the present context is that as the stock of liquid financial assets does not, as an empirical matter, fluctuate wildly and is not high relative to the flow of income, it is acceptable to bypass the specification of (several) consumption and investment functions as well as the labyrinthine interrelationships between the household and business sectors, for instance, the distribution of the national income between profits, proprietors' income and employment income, the retention of profits, and the provenance of finance for investment."

Thirdly, while changes in the aggregate *size* of the general government budget deficit can provide a floor under aggregate demand, it is by no means the only lever in the fiscal toolkit. Fullwiler (2009) abstracts from the budget *composition*; specifically, how changes to taxing-and-spending activities could raise aggregate demand while leaving the overall budget stance

[1] The idea that a sector is a "net contributor to aggregate demand" only when it is deficit-spending connotes, quite implausibly, that aside from 1997-2007 the US private sector was a "net drain on aggregate demand".

relatively unchanged yet actually improving the budget balance. An analyst must also be careful about drawing or inferring strong conclusions from an *ex post* accounting framework (see section three).

Turning to Zezza's (2009) point (3), while a negative FB is likely to result in a "net increase in debt" for the public sector (with a sidenote for privatisations), the same is not true for the other sectors. Credit market debt is only one financial claim in the calculation of net financial assets between the private and foreign sectors.[2] In January 2012 a blogosphere debate erupted over the concept of saving in MMT texts. An equation derived from the SFB three-sector model and, presented by an anonymous blogger who pens under the name of JKH, became the subject of an online exchange.[3] There are at least four points of conjecture in the so-called "S = I + (S - I)" debate.

The first relates to the suitability of redefining a private surplus as "net saving" in view of the overlap with standard terminology used in the National Income and Product Accounts. The second is that MMTers often use the term 'saving' when they mean the redefined "net saving".[4] Why co-opt and redefine an existing term only then to conflate it with another existing term? The third point of conjecture is that a private surplus does not capture the concept of (net) saving. To get to the crux, whereas private saving in gross or net terms reflects the cumulative contributions of all sectors, MMT texts typically focus on the three-sector SFB model which gives an incomplete picture of the saving-investment nexus because the saving of the private sector amassed on itself "net out" from the analysis. In the absence of qualifying remarks that abstraction could give the connotation that the public and foreign sectors are more important to driving private saving and aggregate demand. The fourth concern is whether the role of public sector supplied "net financial assets" (NFA) as a source of saving and vehicle for private agents to amass wealth, occurs more at the centre (which is the strong impression in MMT literature), or at the margins. The importance of public sector NFAs to private portfolios is drastically elevated when looking at net positions instead of gross positions.

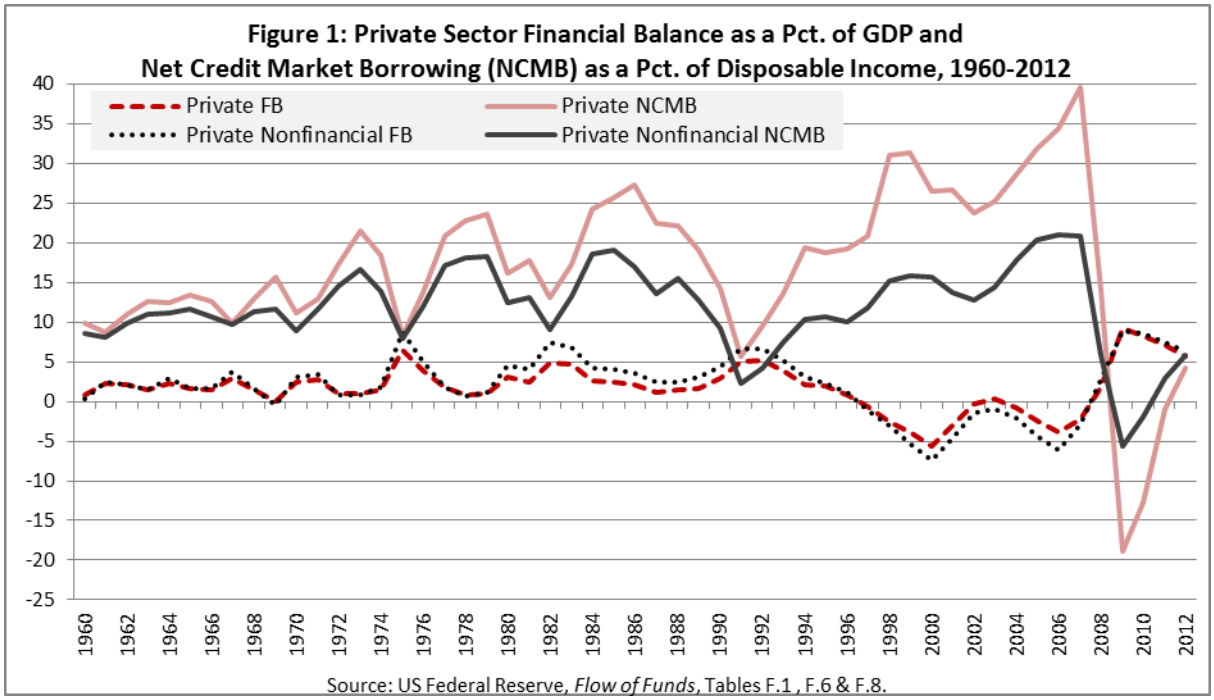
To sum up, the "S = I + (S - I)" debate is about precision and consistency in terminology; and the problems of excessive aggregation without qualification. There is a link between Zezza's (2009) stylised interpretations of movements in sectoral FBs, Fullwiler's (2009) SFB-inspired "model of aggregate demand" and the "S = I + (S - I)" debate. It is the potential to overstate the macro role of the government sector by netting out intra-private sector developments. Perhaps the terminology of "net saving" to denote a sectoral surplus and "net increase in debt" (Zezza, 2009) or "net borrowing" (Godley, 1999) for a sectoral deficit is able to convey the gist of complex economic phenomena to non-specialists; however, as it is technically incorrect it could also confuse. A sector's FB implies only a change in its NFA position *vis-á-vis* at least one other sector and hints mainly at the following:

> "To reiterate: a negative (positive) financial balance means only that (cet. par.) the agent/sector is getting less (more) liquid and more (less) fragile. It does not imply that it is getting poorer, nor does it convey any information

[2] Consider that direct investment and portfolio equity comprise around three-fifths of US gross foreign assets and one-third of US gross foreign liabilities at market value excluding financial derivatives.
[3] For a meticulous overview of the debate see JKH (2012A).
[4] As one example Galbraith, Wray and Mosler (2009, p. 9) argue that a sector's FB/surplus "is called saving" and remark soon after "The nongovernment sector accumulates net claims on the government; the nongovernment sector's *"net saving"* is equal (by identity) to the U.S. government's deficits [Emphasis added]."

about how the composition of its balance sheet has changed precisely." (Dos Santos and Silva, 2010, p. 10).

While the above quote suggests that the SFB framework can provide Minskyan-styled insights on financial fragility it must be remembered that Minsky's (1975) concern was with gross liabilities not net liabilities. Prior to the crisis many of the Levy Strategic Analyses conveyed the message why we should be worried about a private deficit by supposing a stable relationship (at least "stable" enough to give plausibility to modelling projections) between the *private* sector's FB (percentage of *GDP*) and *private nonfinancial* sector's net borrowing in credit markets (percentage of *disposable income*). Godley and Zezza's (2006, p. 2) comments on such a projection suggest econometric derivation: "This may or may not be a correct inference, but the history of the relationship between the two series gives it some plausibility." Figure 1 shows this inverse though somewhat erratic relationship.

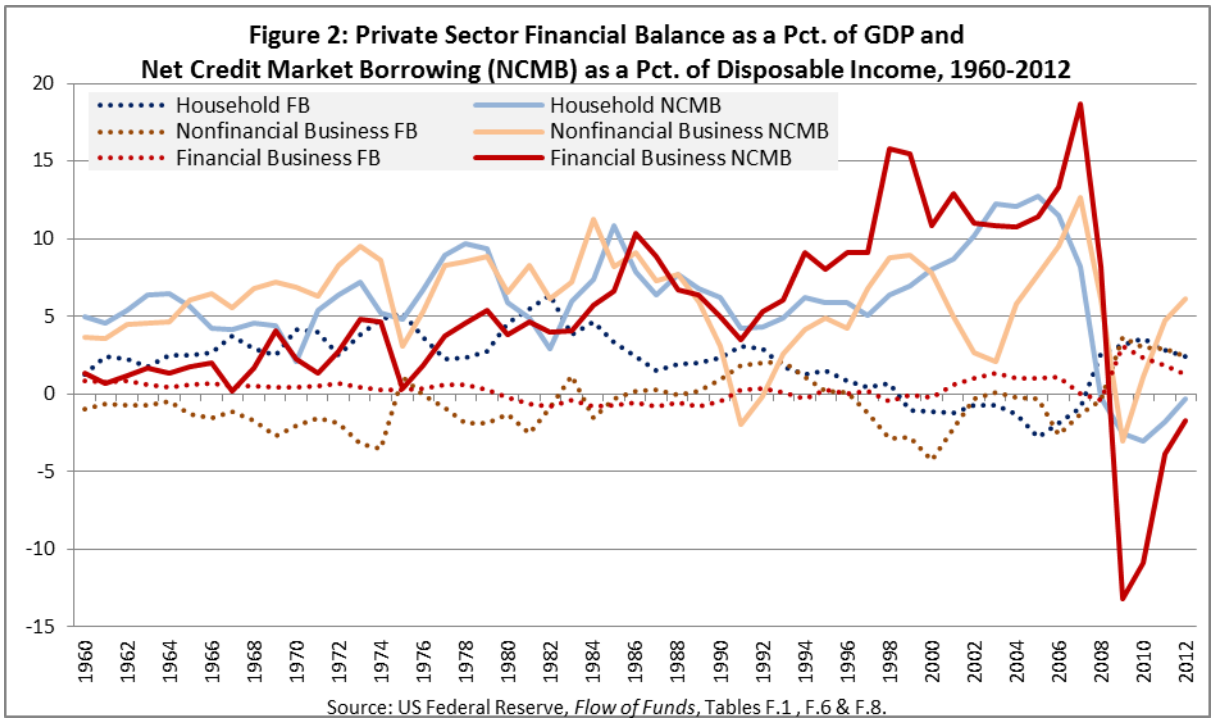


It is noteworthy that the rate of net credit market borrowing by the US nonfinancial private sector (scaled against disposable income) during 1997-2007 was not significantly more elevated than in the 1970s and 1980s when the private sector was running large surpluses. The two data series have an inverse but inconsistent relationship.[5] The astute reader may wonder why Levy scholars decided to infer an econometric relationship between the private sector FB and net credit market borrowing by the private *nonfinancial* sector. Where does the debt of financial businesses fit into the picture? During 1997-2007 the financial sector's FB summed to $478bn while its debt outstanding mounted by $11,475bn. What should one make

[5] One doubts whether the econometric shortcut can be relied on in general and particularly in an altered macro environment where private agents are deleveraging from debt or reluctant to take on new debt. The inference that it is not important to differentiate amongst the types of borrowing occurring is also a little unsettling. A rise (or fall) in the proportion of credit going to mortgage finance say relative to that going to fixed investment by nonfinancial firms surely bodes for different macro implications.

of the US financial sector "net saving" in the SFB jargon while amassing credit market debt on a record scale: it was not getting more liquid and less fragile.

Figure 2 shows the FBs and net credit market borrowing rates of the three main private *subsectors*. Two points are worth making. The FB of any subsector does not give any indication of the state of financial fragility *within* that subsector. Such issues may be exceedingly important to understanding the financing relations in the build-up to the 'Great Recession'. The contrasting robustness of US household balance sheets amidst widening wealth and income inequalities suggest a need to explain an expansion of credit flows to net debtor households from banks *and* from net creditor households (intermediated by nonbank financial institutions). Secondly, in a macro context where net debtor private agents are expected to rebuild savings for some time (either paying down debt outright or reluctant to re-lever to any significant degree), the ability of the SFB approach to offer insight on the extent to which such processes could occur autonomously or otherwise be impeded seems limited for palpable reasons (e.g. most private sector debts are "inside debts" owed to itself).



A three-sector macro model that abstracts from the labyrinthine interrelationships between the household and business sectors and uses econometric inference to infer plausible changes in the gross levels of private nonfinancial debts clearly puts to the side many issues that are important to understanding the macro economy and that are of interest to heterodoxy. That the approach is useful for modelling real capitalist economies in historical time is not a disputed matter.[6] It does nevertheless offer a stylised lens that is suited to drawing conclusions of a tentative nature and one finds such nuance in Godley's (1999, 2000, 2005) papers along with the Levy Strategic Analyses he co-authored. There are instances when SFB proponents forward analysis and policymaking prescriptions under the pretence that it is

[6] See also Dos Santos and Silva (2010, p. 1) who remark that there is considerable doubt in heterodox circles as to "*why exactly* the New Cambridge three balances approach (which many consider too aggregated and/or simple and/or based on implausible behavioural assumptions) is useful for applied macroeconomic modelling."

derived from the logic of an "accounting identity" when it is not so. JKH (2012A) records concerns that MMTers do tend to frame arguments as a "matter of accounting" that stretch the SFB accounting prism too far. There is a perception that MMTers conflate the private FB with the household FB and ardently push the view that a public deficit is vital in order for households to save and, in the process, oversimplify their discussion of the macro economy and policy advice.

2. The rise of the deficit owls at the Levy Economics Institute?

> "I should note that Wynne [Godley] came to explicitly adopt my 'government-centred' view of money, concisely stated as 'taxes drive money'. He proposed to write a textbook in which money entered the first chapter as the means of paying tax liabilities." R. Wray (2011, p. 23)

A recurrent feature of the Levy Strategic Analyses is the modelling of a "baseline" scenario which seeks to examine the likely economic outcomes of present fiscal and monetary policies using the Congressional Budget Office's (CBO) estimates for GDP growth and the general government budget. Alternative modelling scenarios are typically provided. Sometimes in the build-up to the crisis the alternative scenarios included projections where the private sector FB reverted back more in line with its longer-term historical average, that is, with changes in the size of the general government budget balance essentially modelled as the balancing item needed to attain the "official" estimates for GDP growth.[7] Framing the macro outlook and policy thinking as pivoting on changes in the *size* of the budget deficit may be appropriate under certain circumstances. When a big crisis hits, the endogeneity of fiscal policy (i.e. in the sense that tax receipts and unemployment benefits both move in a countercyclical fashion) means that policymakers have relatively little control over the budget balance. There is also no debate that efforts to curb the budget deficit should not come at a risk of impeding an economic recovery as that could be self-defeating and ultimately more costly. But one also wonders about the relevance of changes in the *composition* of the government budget.

Many scholars who publish at the Levy Economics Institute are MMTers while many others are sympathetic to the MMT view. To what extent Godley embraced MMT is unclear. Wray's (2011) remarks quoted at the start of the section suggest that Godley was willing only to accept that centralised authorities and the imposition of taxes were important in the historical evolution of monetary systems. There is little nonetheless in Godley's published work which indicates that he followed MMTers in arguing "tax receipts cannot be spent" and bond sale receipts "cannot finance or fund deficit spending (Wray, 1998, pp. 78, 85)." From those counterintuitive claims it is concluded that a "sovereign government" can never default or go insolvent unless its policymakers choose to do so and perhaps, unsurprisingly, that all of the fuss over the sustainability of the US public finances is exactly that. In the words of Nersisyan and Wray (2010, p. 11):

> "Government actually spends by crediting bank deposits (and simultaneously crediting the reserves of banks)... This is a key to understanding why perpetual budget deficits are 'sustainable' in the conventional sense of that term... Indeed, we argue that modern sovereign governments spend by crediting bank accounts—they do not really spend tax revenue, nor do they borrow by selling bonds."

[7] See, for example, Godley, Izurieta and Zezza (2004) and Godley *et al.* (2007).

MMTers reject the conventional understanding of "money-financed fiscal policy" (i.e. the Fed buying T-bonds in the open market) in favour of an unconventional position that *all* "government" spending is financed by "government" via "crediting bank accounts" or "keystrokes".[8] The MMT description of how the modern monetary system and public finances work in practice is counterintuitive and has received critique from several heterodox analysts (e.g. Gnos and Rochon, 2002; Lavoie, 2003, 2011; Fiebiger, 2011, 2013; JKH, 2012B). In short there is no utility in depicting the "government" as financing *all* spending by net/new money creation when that claim applies only to the central bank.[9]

The above issues provide context for the following discussion. Any heterodox economist who admits to worrying about the "sustainability" of public finances is potentially liable to a dismissive critique from MMTers. Strangely enough, concerns about keeping the budget deficit and public debt levels at "tolerable levels" do find a hearing in the Levy Strategic Analyses published after the 2001 recession, but not in the wake of the "Great Recession". After warning about the perils of a private deficit prior to the 2001 US recession, and lamenting the make-up of the Bush Administration's budget deficits (on wars of choice and tax cuts weighted towards the rich), the focus of the Levy Strategic Analyses in 2004 was on the return of "twin deficits". The expansion in the US budget deficit and ballooning trade deficit were taken as boding for trouble. As remarked by Papadimitriou *et al.* (2004, pp. 8-9):

> "Unsustainably high budget deficits and record current account deficits are characteristic of this [baseline scenario] path... Because relative government and foreign deficits would both be higher than the growth rate of GDP, government and foreign debt would rise steadily, relative to GDP. By the end of 2008, the former would rise from its 2003 level of 44 percent to 58 percent... Even with interest rates assumed to be constant, this would imply a growing interest burden for general government and for the nation. Were interest rates actually to rise over time, as the CBO now assumes, then matters would be much worse."

The macro projections did not come to pass. Worrying about a rise in the general government debt to 58% of GDP seems out of place in the aftermath of the 'Great Recession'. Nonetheless, what is important is that the authors expressed explicit concern about what was considered in their own words to be an "unsustainable" path for the budget deficit; and that the very implausibility of the baseline scenario led them to model alternative scenarios that would cut the budget deficit in half as a percentage of GDP (within five years). The alternative scenarios included one where the deficit was curbed by cutting public spending and another by rescinding the Bush Administration's regressive tax cuts. Godley, Izurieta, and Zezza (2004 p. 5) were also concerned with US public debt:

> "[In the baseline scenario,] a government deficit ratio equal to 9 percent of GDP, combined with interest rates in excess of 5 percent, would send the

[8] The reader might surmise a meaning of *ex nihilo* money creation for "credit bank accounts" and "keystrokes" but neither phrase contains qualitative information to that effect (i.e. most spending by any agent involves the "crediting" of a bank account and authorisation by pressing "keystrokes" on a computer keyboard).

[9] Fullwiler, Kelton and Wray (2012, p. 7) defended their position that fiscal receipts cannot finance spending by the federal government because the central bank can purchase T-bonds in the secondary market. That defence is unconvincing: to the extent that some portion of T-bonds outstanding are held on the central bank's books as monetary assets that only means that the Treasury previously issued bonds and then spent the proceeds.

> internal *and* the external debts hurtling towards 100 percent of GDP, with more to come after that. And, if there is anyone who considers a 9-percent budget deficit to be tolerable, what about 15 percent, or 30 percent? It has to stop somewhere. The longer the debt and deficit ratios go on rising, the larger and more painful the adjustment will be when the tide eventually turns."

The authors did not think a budget deficit of 9% of GDP was tolerable and also argued that the only remedy to the "disastrous situation" envisioned in their baseline scenario was a sustained rise in net export demand and dollar devaluation. As noted above, perhaps owing to the severe costs and extraordinary nature of the "Great Recession", the authors of Levy Strategic Analyses are no longer as concerned with the path of the US budget deficit or public debt levels. When the crisis first hit the Strategic Analyses by Godley *et al.* (2007) and Papadimitriou, Hannsgen and Zezza (2008) were well ahead of most analysts in recognising the direness of the economic situation and urgency to relax fiscal policy. The following remarks from Godley, Papadimitriou and Zezza (2008, p. 4) are intriguing:

> "It seems to us unlikely that, purely for political reasons, U.S. budget deficits on the order of 8–10 percent through the next two years could be tolerated... But looking at the matter more rationally, we are bound to accept that nothing like the configuration of balances [in the baseline scenario]... could possibly be sustained over any long period of time. The budget deficits imply that the public debt relative to GDP would rise permanently to about 80 percent, while GDP would remain below trend, with unemployment above 6 percent. Fiscal policy alone cannot, therefore, resolve the current crisis."

As we all know the US general government budget came in at -11.9% of GDP in 2009, -11.4% in 2010, -10.2% in 2011 and -8.7% in 2012. The expansion in general government debt since the crisis began was rapid by any standards: rising from 57.0% of GDP in 2007 to 92.9% at year-end 2012. The above quote is intriguing as there was explicit concern about an "unsustainable" path of fiscal policy amidst a recognition that even if the budget deficit was in the order of 8-10% (which it was) the crisis would still not be fixed (which it was not) at least in the short-term. Given that comparatively large budget deficits are here for a while under any foreseeable circumstances and the follies of orthodoxy on the macro effects of government deficits (e.g. Ricardian equivalence) it is understandable why Papadimitriou, Hannsgen and Zezza (2009, pp. 2-3) thought it appropriate to remind everyone that US federal government liabilities were still at levels below those recorded at the end of World War II (expressed as a percentage of GDP). The March 2010 Levy Strategic Analysis made an argument for a sustained expansion in the budget deficit to bring down the unemployment rate:

> "A Growing Public Debt Will Bring Unemployment Down: A first alternative scenario to be considered uses more plausible assumptions about fiscal policy than those of the CBO... Accordingly, in our alternative scenario we assume permanent tax cuts and a larger increase in government outlays related both to expenditure and transfers to the private sector... [In this scenario the] government deficit remains high relative to GDP, with public debt growing at approximately 101 percent of GDP by the end of 2015" (Zezza, 2010, pp. 3-4).

We have come a long way from when Papadimitriou *et al.* (2004, pp. 8-9) expressed unease about a baseline projection for a rise in the general government debt to 58% of GDP in 2008.

On page four Zezza (2010) wrote: "In this report we have shown that a large and persistent government deficit is and will be needed in the short run in order to reduce the unemployment rate." Whether or not his 'growing public debt' path required large public deficits only in the "short run" was not discernable as the projection stopped at 2015 with the budget deficit coming in at just under 10% of GDP.[10] Moreover, while "generalised" expansions in the budget deficit can lift the employment rate, there is surely much leeway for policymakers to affect economic outcomes by changing the composition of the budget. In the December 2011 Strategic Analysis Papadimitriou, Hannsgen and Zezza (2011, p. 5) commented favourably on President Obama's proposed "deficit-neutral" $447bn stimulus package but did not provide any alternative modelling simulations for a "deficit-neutral" scenario. It is worth recalling that Papadimitriou *et al.* (2004) thought the path of US fiscal policy was so "unsustainable" at the time that they considered modelling alternative scenarios to cut the budget deficit in half within a five-year period. What can explain the documented shift in the analysis and policy advice by the authors of the Levy Strategic Analyses from a cautious "deficit dove" position in the early- to mid-2000s to a more brazen deficit owl position in recent years? There are probably many factors at play.

Perhaps the greater deterioration in labour market conditions in the current crisis relative to the 2001 recession, along with widespread fears that prolonged stagnation looms large (with the Euroland fiasco showing no signs of abatement), are taken as sufficient reasons to relegate all concerns about keeping the US federal budget deficit and public debt levels "under control" to the background for the time being. But given the political derision on the state of public finances and the verity that policymakers should always pursue the public purpose in the most cost-efficient manner the question arises why not model how various changes to taxing-and-spending programs could impact economic growth and unemployment within a relatively unchanged overall budget stance? For example, it would be interesting to know relative to the "baseline" scenario, how a reorientation of government spending away from certain activities (say, military expenditures on wars of choice and regressive tax expenditures) towards more socially-productive activities (say, investment in 'clean and green' technologies) could promote economic growth and employment while leaving the overall budget stance relatively unchanged *but improving* the budget balance.[11] Time considerations may be a factor in why the Strategic Analysis team has yet to pursue that line of analysis, then again, in the April 2012 publication there was a subtle objection to progressive tax reform efforts:

> "Corporate tax loopholes bring up fairness and efficiency issues that are also crucial to the national debate... On the other hand, as the debate over a new reform effort takes shape, some people are hoping that any final bill will be revenue neutral or revenue increasing overall. We, too, are concerned about the equity issues raised by reform advocates, but we worry that arguments over the reform agenda will divert Congress's attention from the need for more realistic and timely tax-incentive legislation that could spur job creation

[10] That Zezza (2010, p. 3) pointed to the "exorbitant tribute" (i.e. the USA "maintains its international role as issuer of the major reserve currency") as a reason not to be alarmed about the financing of public debt in his "growing public debt" scenario was also a little troubling due to the implied inequitable dimensions. For the centre country to be receiving an "exorbitant tribute" other nations (typically poorer) must be paying the bill.

[11] It would also be interesting to know how reforming the inefficient US health care system (say, more in line with the Canadian system) could improve the federal government's budget bottom line while obtaining better health care outcomes.

> over the relatively short time horizon used in the scenarios above" (Papadimitriou *et al.*, 2012, p. 8).

Papadimitriou *et al.* (2012) modelled three different scenarios for the US economy: (1) GDP reverts quickly back to its potential growth rate in line with the CBO's estimates; (2) a more "plausible" outcome where the Obama Administration's temporary tax breaks were renewed; and, (3) a "small" fiscal stimulus. In 2010 President Obama reneged on his promise to let the Bush era tax cuts expire and extended them for two years. When considering that the top 1% of taxpayers receive around 25% of the tax cuts while the bottom 40% get only 9% there seems no justification in defending or extending them (Crotty, 2011, p. 13). It could be reasoned that any increase in rates of taxation are undesirable now if it leads to a decrease in private spending, still, why not advocate for replacing the Bush era tax cuts with progressive tax cuts? Intriguingly, Papadimitriou *et al.* (2012, p. 3) made the following point, but did not model any scenarios involving progressive changes to the tax system:

> "This increasing concentration of income among the very wealthiest tends to slow down economic growth for reasons that vary from the simple to the complex. For starters, lower-income households tend to consume almost all of their income, while the highest-income 1 percent of households puts aside perhaps 50 percent of its lifetime income (Dynan, Skinner, and Zeldes 2004). Therefore, if the government were to raise taxes by, say, $100 billion a year on the richest people, and transfer that money to the poorest tenth or quarter of Americans via tax credits, consumption spending would rise by perhaps $50 billion."

Let me do some back of the envelope calculations. In 2011 the income share of the top 1% of US income earners was around 20% (and for the top 10% around 48%). Raising an extra $100bn from the top 1% of income earners would raise the ultra-rich's tax rate for the year 2011 by about 3.3% (assuming that their personal income was taxed at a rate of 22.5%). Why stop at a 3.3% increase? Doubling the average income tax rate on the top 1% of taxpayers from the present 22.5% to 45% would have generated an additional $673bn in government revenues for the year 2011 and if spent on investment (preferably non-military) or distributed to consumers with high propensities to spend increased GDP by $336.8bn (i.e. 2.2% of total GDP) all *without* increasing the public sector deficit. The point here is that there is considerable elasticity within any given budget for changes in the composition of spending and tax base to affect economic outcomes. SFB adherents put these issues largely to the side for reasons that may need to be revisited. A new fiscal stimulus could probably pay for itself in the current macro environment. In recent Levy Strategic Analyses the impression often given is that there are no financial constraints on public finances. The question arises what theory is being drawn on to support what could be taken as nonchalant calls for policymakers to spend with little regard to the longer-term implications for public finances?

This author has had difficulty in finding Levy papers that cover tax reform in depth.[12] Analysing the ins and outs of the US taxation system including reform debates does not appear to be a major focus of the Levy Economics Institute. Why? After all, the structure of the tax system matters to shaping the incentives of businesses to invest, and to obtaining progressive social outcomes. It should be uncontroversial to say that taxes constitute the

[12] Consider that since 2000 until the time of writing only one of the sixty-nine Levy *Public Policy Briefs* discusses the progressivity of the tax system and it was published over a decade ago (Moudud and Zacharias, 2001).

main source of government revenues; yet, this point is rejected by MMTers. Many MMT papers are published at the Levy Economics Institute guided by the "taxes drive money" view. So there is some discussion of taxation from an unusual perspective where the role of taxes is to create demand for the State's money and not to finance expenditures. As Tcherneva (2011, p. 13) puts it, "taxes and bonds do not finance government liabilities in modern monetary systems that use non-convertible free-floating currencies." The following quote from Papadimitriou and Hannsgen (2010, p. 6) indicates that some authors of the Levy Strategic Analyses have gone further than Godley did (at least in published writing) in embracing MMT:

> "[T]here is no doubt that the Fed coordinates its activities carefully with those of the Treasury Department to ensure that funds are available to pay for government operations while, at the same time, interest-rate targets are met" (Wray 1998; Bell 2000).

The referenced works are widely recognised as "classic" MMT scholarly texts and deny that fiscal receipts can finance federal spending. Elsewhere Hannsgen and Papadimitriou (2010, p. 6, ft. 3) argue "In the current era, the government 'prints money' mostly by sending people checks. Banks eventually redeem these checks at the Fed and are credited with the proper amount of bank reserves, which can be created with a few keystrokes." Referring to a "government" that finances spending by "printing money" and, or, by "keystroking money" into existence on an *ex nihilo* basis is MMT 101:

> "The federal government spends by cutting checks—or, what is functionally the same thing, by directly crediting private bank accounts. This is a matter of typing numbers into a machine ... There is no operational procedure through which federal government 'uses' tax receipts or borrowings for its spending" (Galbraith, Wray, and Mosler, 2009, p. 7).[13]

> "At the level of the national government, taxes don't pay for nothing... If government doesn't spend tax revenue, how does it finance its spending? It spends its currency into existence. In modern economies, this is accomplished through keystrokes that credit bank reserves, with banks crediting accounts of recipients" (Wray, 2012, pp. 14, 16).

Perhaps the rise of MMTers at the Levy Economics Institute can explain why the policy content of Strategic Analyses have shifted from a deficit dove to deficit owl position in recent publications. If so does it matter? It is worth quoting from two Circuit theorists, Bougrine and Seccareccia (2001, p. 12), who came to embrace the counterintuitive MMT description of how fiscal policy works:

> "[I]t should now be obvious to the reader that taxes cannot fund, say, social programmes that support the poor... Taxes... are there to destroy money; their role is *not* to fund public spending... For this reason, when one sees policy makers on the political Left fighting against tax cuts because supposedly taxes are needed to 'fund' social programmes, we would argue that their fight is somewhat misdirected" [emphasis in original].

[13] Galbraith, Wray, and Mosler (2009) seek to reassure that the costs of Social Security and Medicaid can be afforded over the longer-term: presenting counterfactuals as factual is surely counterproductive.

In the March 2013 Strategic Analysis Papadimitriou, Hannsgen and Nikiforos (2013, p. 24) offered in the conclusion that "we advocate no more tax increases *whatsoever* given the vast amounts of unemployed resources in the US economy and in the rest of the world [Emphasis added]." As there were no clarifications on the circumstances when that policy advice would no longer be advocated the reader is left to deduce that it is at least until there are no unemployed resources. The subtitle of this paper reflects a perceived need to rejuvenate a "Robin Hood" role for the State. The argument is that changes to the US federal government's taxing-and-spending activities could make a significant contribution to boosting the still fragile economic recovery without expanding the budget deficit or public debt volumes. This author is not against an additional fiscal stimulus (even if that results in a higher deficit) but has reservations about the robustness of MMT-styled nonchalant analyses of public debt and external debt sustainability; in particular, the pivoting of analysis around the counterintuitive claim that the general public cannot finance federal government spending.[14]

An October 2012 Levy Public Policy Brief by Hannsgen and Papadimitriou (2012) on the "fiscal cliff" was an intriguing read for several reasons. In that paper the authors invoked the MMT notion of a "sovereign currency issuer" as a reason why there is little if any reason to be concerned about the *long-term* sustainability of public finances, including the stability of interest rates on Treasury bonds, citing a paper by themselves and another by Nersisyan and Wray (2010). Given that the MMT notion of a "sovereign currency issuer" is used to justify a "benign neglect" view on fiscal policy it is worth devoting some time to this concept. Consider first the following remarks where Hannsgen and Papadimitriou (2012, p. 6) seek to dispel concerns of a "bond strike" as a generalised matter:

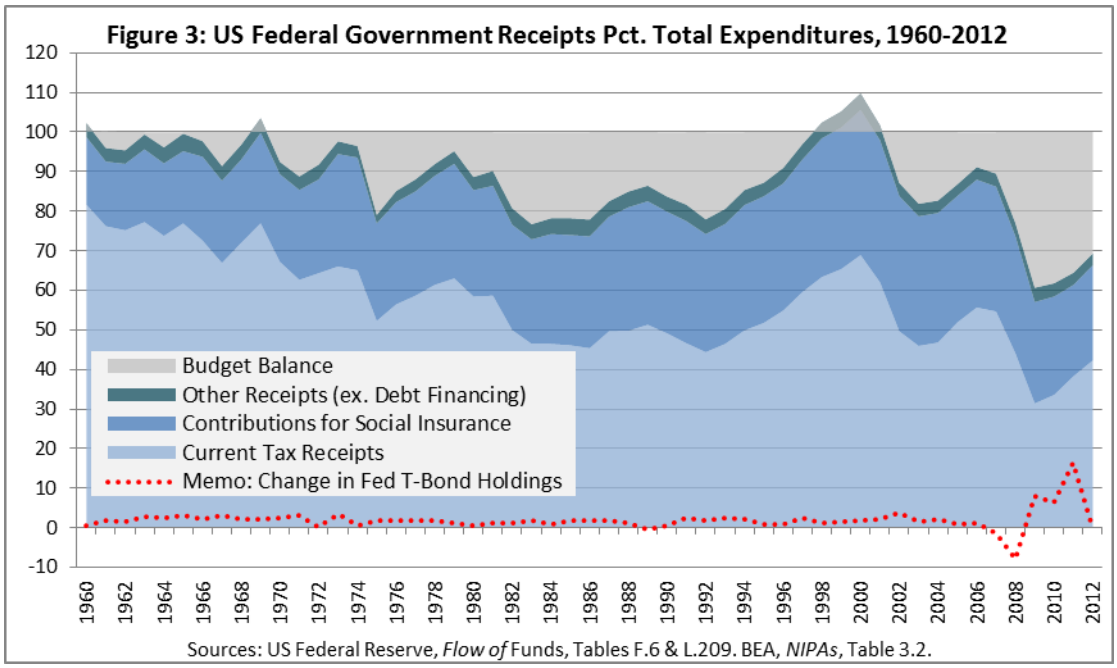
> "Central banks in countries with sovereign currencies and flexible exchange rates use open market operations to keep short-term interest rates stable, and can even, given enough time, consistently hit a target for long-term yields. [In footnote] In fact, chartalists point out that, all things being equal, *increases in government spending* tend to *reduce interest rates*, as they *add to the stock of money*. *Securities sales occur after* the fact and are a means of stabilizing interest rates, *rather than 'financing' government spending* (Wray 1998). In practice, this view is a bit less convincing with regard to *long-term* interest rates, without some form of open market purchases near that end of the maturity spectrum—a type of operation that is often seen as 'unconventional'" [emphasis added].

If sales of Treasury securities do not "finance" spending but are issued "voluntarily" after spending to "stabilise interest rates", then, the "fiscal cliff" should be a non-issue as according to MMT the Treasury deficit-spends *first and* then "voluntarily" issues bonds *later* as a part of monetary policy (to set the overnight federal funds rate target). In contrast to Hannsgen and Papadimitriou (2012), critics have difficulty with MMT claims that fiscal receipts are not financing operations, and that federal expenditures increase the "stock of money" putting downward pressures on interest rates.[15] One problem with the MMT "benign neglect" / "do not worry" analyses of public finances is that the "keystroke" theme is non-descriptive. Most

[14] Note that MMT advocacy of a 'Big Government' agenda is not instituted merely in view to combating the fallout from the "Great Recession". As one example, Wray (2007) argued prior to crisis, for economists to approach government spending in operational terms as a "ratchet" increasing in downswings and *upswings*.

[15] Obviously, as the Treasury (i.e. the coordinating agent for federal government agencies) must first procure deposit balances in order to finance spending, it is misleading to infer that its spending activities are analogous to the central bank's *ex nihilo* financed asset acquisitions and credit extensions.

analysts would infer from Figure 3 that taxation receipts (including contributions to social insurance as a compulsory quasi-tax) are the main revenue source for the US federal government followed by bond sales. The red line shows the change in T-bonds on the Fed's books as a percentage of total federal expenditures. By that measure it is correct to say that "government" financing of "government" spending via "keystrokes" is usually a bit above zero.



The misleading "keystroke" theme permeates through much of the MMT discourse including the binary schematisation of a "sovereign currency issuer" operating on a floating exchange rate versus a "nonsovereign currency user" operating on a fixed exchange rate. When Nersisyan and Wray (2010, p. 11) argue that "The United States, like many other developed and developing countries, has been operating on a sovereign monetary system ever since it went off the gold peg in 1973" the analyst is left wondering which of the "many" developing countries they are referring to? Surely not those caught up in the 1980s Majority World debt crisis or spate of financial crises in the 1990s such as the 1997/1998 East Asian crisis?[16] Those crises strongly support an alternative view that the critical issue when it comes to macro policy autonomy is not adoption of a "flexible exchange rate" but the *currency denomination of external liabilities; and, the extent to which a nation's currency is utilised by other nations as international money*. Wray (2003, 2006) went as far to argue that the US dollar's lynchpin role as the "key" currency did not make the centre country a "special" case when matters are surely otherwise.[17] Quoting now from Wray (2006, pp. 9-10) in a paper on

[16] The authors are omitting actual history where the IMF under the auspices of US Treasury officials has at repeated times bled debtors dry and spread "global neoliberalism" for paltry "debt relief" in a way reminiscent of the ancient usurers and made possible by an international monetary system built on dollar hegemony.

[17] Wray (2006, p. 21) was unaware that external deficits can be financed by incurring foreign-currency debts. The truth is that developing countries have external liabilities contracted mainly in foreign-currencies (i.e. public and *private* debts as well as import bills). Floating the exchange rate is no cure-all to policy autonomy as currency depreciation increases the costs of servicing external liabilities relative to the domestic currency unit.

why MMT "full employment" policies are thought to be effortlessly affordable *and* on a universal basis:

> "Banks prefer interest-earning treasury debt over non-interest earning excess (undesired and/or nonrequired) reserves, hence there is no problem selling the treasury debt. Note, also, that *if banks did not prefer to buy government bonds*, *the treasury* (and central bank) *would simply avoid selling them*, and, indeed, would not *need* to sell the debt as the banks preferred to hold non-interest earning reserves. In other words, far from requiring the treasury to 'borrow' by selling new issues, government deficits only require the central bank and treasury to drain excess reserves to avoid downward pressure on overnight interest rates. *This means that the wide-spread fear that 'markets' might decide not to buy treasury debt if budget deficits are deemed to be too large is erroneous*: bonds are not sold to 'borrow' but rather to drain excess reserves. If *'markets' prefer excess reserves, then bonds need not be sold*—and won't be because there will not be pressure on the overnight rate to be relieved" [emphasis added].

Equivalent remarks can be found in Wray (2013) and Mosler (2013); however, as modern Treasuries issue bonds *first* to deficit-spend at a *later* point the above line of reasoning provides no reason to completely disregard the willingness of financial markets to buy government bonds.[18] Additionally, as discussed below, the belief that "sovereign" Treasuries spend by "keystroking" net/new money into existence as per a bank compromises MMT analysis attributed to the SFB approach.

3. The SFB approach and MMT dictums

> "[Federal] government deficits always add disposable income and wealth to the private sector; the income is received first as a Treasury check and then *may be transformed into an interest-earning government debt"* [emphasis added]. R. Wray (1999, p. 2)

The New Cambridge emphasis on using the SFB accounting identity as a means to gain predictive content on the economy's evolution to inform policymaking differs from its usage by MMTers as an accounting framework to justify theoretical claims. An oft made dictum by SFB proponents is that "budget deficits *create* disposable income and wealth for the private sector." Through the *ex post* SFB identity the public sector adds to disposable income when its expenditures exceed tax revenues. Technically, what is correct from *ex post* vantage point may not be so in *ex ante* terms; and it is only by way of a qualified argument (e.g. underemployment equilibrium) that an analyst can begin to build a case that a planned increase in public spending will raise disposable income and increase private "wealth" relative to an *ex ante* decision to consolidate or keep the budget stance unchanged.

[18] Explanations for why sovereign defaults need not occur should stress the capacity of the central bank to act as the federal government's banker. The restrictions in Euroland on that role were forcefully exposed by the crisis.

When it comes to MMT scholars the above dictum takes on an additional deterministic/totalising meaning owing to the "net" money creating and destroying powers attributed to the "government":

> "Budget deficits lead to net credits to bank accounts and budget surpluses lead to net debits [note: the authors mean net money creation and destruction]... If banks already have the quantity of desired reserves (which would be the normal case), Treasury spending creates excess reserves in the system... In order to provide a substitute for the excess reserves and hit its target rate, the Fed sells Treasuries to the private sector, thereby transforming the wealth held in the form of bank deposits and reserves into Treasury securities... In other words, sales of Treasuries should be thought of as a monetary policy operation... To recap, a government deficit generates a net injection of disposable income into the private sector that increases saving and wealth, which can be held either in the form of government liabilities (cash or Treasuries) or noninterest-earning bank liabilities (bank deposits)... A government budget surplus has exactly the opposite effect on private sector income and wealth: it's a net leakage of disposable income from the nongovernment sector that reduces net saving and wealth by the same amount" (Nersisyan and Wray, 2010, p. 11-2).

The authors intermingle and confuse *why* the central bank conducts open market sales of T-bonds (i.e. to drain excess reserves in the banking system) with *why* the federal government *sells bonds* in the first instance (i.e. to procure financing in order to spend). All other economists would describe federal deficit-spending as financed after the sale of T-bonds not before; and, not depict the sale of bonds by the Treasury as a "voluntary" monetary policy operation. Drawing the threads together and, abstracting from the foreign sector, in the MMT rendering of the SFB prism a federal deficit *must* increase disposable income and add to private sector "wealth" because it is financed by net/new money creation. If the Treasury did not "voluntarily" perform the central bank's core responsibility (i.e. set interest rate policy) then the "net/new money" thought to be created *as* the Treasury deficit-spends need not be converted into T-bonds; indeed, for that reason MMTers redefine Treasury debt as "money" (i.e. an alternative interest-bearing-asset to reserves and currency). Furthermore, due to the belief that the Treasury issues bonds to drain "excess" reserves (said to be created by the Treasury having already deficit-spent), that is taken as evidence that federal budget deficits can only create downward pressures on interest rates (Tcherneva, 2010, p. 18). All of the above claims pivot on the counterfactual claim that the Treasury creates net/new money whenever it spends.

Public sector activities can have "crowding in" effects though the MMT dictums that "budget deficits create disposable income and private sector wealth" and, vice versa for budget surpluses, go too far.[19] Such dictums are not "truth" statements that can be assumed as

[19] There are times when running or trying to attain a budget surplus is inappropriate but there is no reason to fear budget surpluses as a generalised matter because the private sector would "run out of net money hoards" (Wray, 1998, p. 79). Budget surpluses do not in theory "automatically" lower disposable income or for that matter "destroy/deactivate" the "public's money" (i.e. the proceeds can be used to pay down debt such that there is no change in the money supply). Nor must a budget surplus

"operational realities" of the modern monetary system or the "pure accounting logic" of the SFB model. The US Treasury does not create money whenever it spends and the SFB accounting framework is only an *ex post* identity. Government bonds can be a "wealth" vehicle and portfolio income source for private agents; however, that should not guide policymaking considerations. It is the net creditor private and foreign agents who are likely to be the holders of any increases in public debt (with sidenotes for funds managed by pensions and central bank purchases of T-bonds). Private agents who are overextended and/or underemployed do not need "savings" in the form of public debt *per se* but debt relief and spending to sustain income and employment. In the modern monetary system the choice between taxes and bond sales is not a debate over "alternative tools of monetary policy (Bell, 2000, p. 617)" but of alternative *financing* operations. That choice can be cast to some extent as whether policymakers finance a portion of spending by supplying wealthier creditor agents with an interest-bearing asset or by taxing them. As the crisis continues policymakers should assist distressed/unemployed agents without paying much regard to the "net saving desires" of wealthier domestic creditor agents.

4. A taxing-and-spending role for the state?

Few issues are more polarised than the state of US public finances. The deficit doves and deficit owls both agree that if a significant number of governments prioritise fiscal consolidation the result will be stagnation. In an outstanding paper Crotty (2011) offers compelling *political* economy arguments as to whom *within society* should pay for the costs of the crisis and the longer-term costs of an aging population, which have been made all the more difficult, by the imprudent draining of public finances on regressive Bush era tax cuts and wars of choice. His analysis is influenced by the research of the Centre for Budget and Policy Priorities which suggests a longer-term budget crisis is brewing in the United States due in substantial part to projected spending increases on Medicare, Medicaid and on debt servicing (e.g. Greenstein, 2010). Neoliberals are already advocating their "solution" (i.e. downsizing the Welfare State); and, it is surely the job of heterodoxy to provide alternatives so the costs will not be borne by the most vulnerable members of society.

Table 1 lists a variety of revenue raising and spending efficiency options for the United States detailed in Crotty (2011). The point is not the merits of any specific policy option but that there is significant scope to restrain US public debt growth without impeding the recovery or slashing "federal spending on programs that fund productive government investment and assist the poor, the middle class, the sick and the elderly" (Crotty, 2011, p. 23).

necessarily make everyone all the poorer: a fall in public sector issued NFAs can be counterbalanced by a rise in intra-private sector financial claims.

Table 1: Cumulative Budget Possibilities over 2011-2021 (in Trillions)	
Projected deficit with Bush Jr. era tax cuts and exemption for Alternative Minimum Tax	$11.6
(a) Cost of Bush era tax cuts and Alternative Minimum Tax	$4.6
(b) Gain from reducing troops in Iraq and Afghanistan from 225,000 to 45,500 by 2015	$1.3
Projected deficit excluding (a) and including (b)	$5.7
Memo Items: Revenue Raising Options	
Doubling average individual income tax on top 1% of income earners	$4.0
Increasing effective tax rate (ETR) on top 1% of income earners by 10 pct. points	$1.7
Increasing ETR on top 1% of taxpayers by 5 pct. points and top 2-5% by 3 pct. points	$1.2
Eliminating 20% of the more than $900bn in revenues lost through "tax expenditures"	$1.8
Taxing dividends and capital gains at same rate as wages and not excluding capital gains on inherited assets from taxable income	$1.1
Raising corporate ETR by eliminating 75% of business "tax expenditures"	$1.2
Small financial transactions tax on stocks and derivative sales	$1.5
Removing excessive payments to pharmaceutical companies in Bush Jr. Medicare Bill	$1.0
Memo Items: Spending Efficiency Options	
Adoption of Canadian-style health care system	$10.0
Adoption of single-payer system based on Medicare	$4.0
Source: Crotty (2011).	

Evidently, that Washington policymakers must ensure a self-sustaining recovery is able to take hold provides no reason not to contemplate how to get the most out of any given budget stance, or to consider changes to the revenue base. Taxation is the main source of fiscal activism and a factor in shaping the incentives of businesses to invest.[20] A rejuvenated taxing-and-spending "Robin Hood" role for the State could also help amend the imbalance after 1980 where most of the gains from economic growth accrued to wealthier individuals (e.g. Atkinson *et al.*, 2011). Stockhammer (2012) argues cogently that rising income and wealth inequalities played an important causative role in the "Great Recession" by: (1) contributing to downward pressures on aggregate demand as higher income groups have a lower marginal propensity to consume; (2) "pushing" lower income groups into debt to compensate for stagnating or falling real wages; and, (3) encouraging dangerous speculation as richer households tend to hold more riskier financial assets. Recalling Papadimitriou, Hannsgen and Nikiforos' (2013, p. 24) remarks that "we advocate no more tax increases whatsoever" one can only hope that they do not intend to oppose progressive tax reforms, for example, the efforts to raise revenues from the estimated $21-32trillion held in tax havens (Shaxson, 2012).[21]

[20] The shift in accumulation patterns to profit generation through financial channels suggests that there is merit in considering policies, which would provide incentives for a reorientation of economic activity back into the productive sphere (e.g. increasing capital gains taxation and adopting a financial transactions tax).

[21] There is no reason why tax rate increases on the top-income earners would impede net debtor private agents from repairing balance sheets. As the top-income earners save a greater portion of their income it follows that raising the rates of taxation on the ultra-rich could have a net stimulatory effect on the economy assuming that the additional revenues are spent on appropriate programs.

Conclusion

> "So, what we see is an attempt to coordinate the government's spending with taxes and bond sales and it creates the *illusion* that what's happening is that the government is taking money from us and using it to pay for the things that it purchases. But that's not really what's going on" [emphasis added]. S. Kelton (2010)

The practitioners of the three-sector SFB model have been widely praised for reminding everyone about the importance of flow-of-funds analysis. That the approach views the macro economy through a "net" lens need not but appears to lend itself to overstating the role of the public sector and to framing policymaking advice through a "budget deficit lever" prism. The "Great Recession" provided a lesson on how fiscal policy can help stabilise unstable economies. At the same time as public debt requires management a "moderate" legacy is surely desirable so as to permit greater "policy space" down the line. Robust arguments are required to defend federal budget deficits (especially in Euroland where the anti-deficit mantra is producing disastrous socioeconomic effects) *and* to revive the State along a taxing-and-spending "Robin Hood" theme. While one can concur with MMTers about the need for an expanded role for the public sector it must be accepted that most federal spending is financed by taking money from people *within society* (non-voluntarily for taxes) creating winners and losers. That is not an "illusion" and to insist otherwise is counterproductive.

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Capturing causality in economics and the limits of statistical inference

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> "Causal inference from observational data presents many difficulties, especially when underlying mechanisms are poorly understood. There is a natural desire to substitute intellectual capital for labor, and an equally natural preference for system and rigor over methods that seem more haphazard. These are possible explanations for the current popularity of statistical models.
>
> Indeed, far-reaching claims have been made for the superiority of a quantitative template that depends on modeling – by those who manage to ignore the far-reaching assumptions behind the models. However, the assumptions often turn out to be unsupported by the data. If so, the rigor of advanced quantitative methods is a matter of appearance rather than substance." David Freedman**:** *Statistical Models and Causal Inference*

Introduction

A few years ago, Armin Falk and James Heckman published an acclaimed article in the journal *Science*. The authors – both renowned economists – argued that both field experiments and laboratory experiments are basically facing the same problems in terms of generalizability and external validity – and that *a fortiori* it is impossible to say that one would be better than the other.

What is striking when reading both Falk & Heckman (2009) and advocates of field experiments – such as Levitt & List (2009) – is that field studies and experiments are both very similar to theoretical models. They all have the same basic problem – they are built on rather artificial conditions and have difficulties with the trade-off between internal and external validity. The more artificial conditions, the more internal validity – but also less external validity. The more we rig experiments/field studies/models to avoid confounding factors, the less the conditions are reminiscent of the real target system. To that extent, Falk & Heckman are probably right in their comments on the discussion of the field vs. experiments in terms of realism – the nodal issue is not about that, but basically about how economists using different isolation strategies in different "nomological machines" attempt to learn about causal relationships. By contrast with Falk and Heckman and advocates of field experiments, as Steven Levitt and John List, I doubt the generalizability of *both* research strategies, because the probability is high that causal mechanisms are different in different contexts and that lack of homogeneity/ stability/invariance does not give us warranted export licenses to the "real" societies or economies.

Experiments, field studies and the quest for external validity

If you mainly conceive of experiments or field studies as heuristic tools, the dividing line between, say, Falk & Heckman and Levitt & List, is probably difficult to perceive. But if we see experiments or field studies as theory tests or models that ultimately aspire to say something about the real target system, then the problem of external validity is central (and was for a long time also a key reason why behavioural economists had trouble getting their research results published).

Assume that you have examined how the work performance of Chinese workers, A, is affected by B ("treatment"). How can we extrapolate/generalize to new samples outside the original population (e.g. to the US)? How do we know that any replication attempt "succeeds"? How do we know when these replicated experimental results can be said to justify inferences made in samples from the original population? If, for example, P(A|B) is the conditional density function for the original sample, and we are interested in doing an extrapolative prediction of E [P(A|B)], how can we know that the new sample's density function P' is identical with the original? Unless we can give some really good argument for this being the case, inferences built on P(A|B) is not really saying anything on that of the target system's P'(A|B).

This is the heart of the matter. External validity/extrapolation/generalization is founded on the assumption that we can make inferences based on P(A|B) that is exportable to other populations for which P'(A|B) applies. Sure, if one can convincingly show that P and P' are similar enough, the problems are perhaps surmountable. But arbitrarily just introducing functional specification restrictions of the type invariance/stability/homogeneity, is, at least for an epistemological realist far from satisfactory. And often it is – unfortunately – arbitrary specifications of this kind that ultimately underpin neoclassical economists' models/experiments/field studies.

By this I do not mean to say that empirical methods *per se* are so problematic that they can never be used. On the contrary, I am basically – though not without reservations – in favour of the increased use of experiments and field studies within economics. Not least as an alternative to completely barren bridge-less axiomatic-deductive theory models. My criticism is more about aspiration levels and what we believe we can achieve with our mediational epistemological tools and methods in the social sciences.

Many experimentalists claim that it is easy to replicate experiments under different conditions and therefore *a fortiori* easy to test the robustness of experimental results. But is it really that easy? If in the example given above, we run a test and find that our predictions were not correct - what can we conclude? That B "works" in China but not in the US? Or that B "works" in a backward agrarian society, but not in a post-modern service society? That B "worked" in the field study conducted in year 2008, but not in year 2013? Population selection is almost never simple. Had the problem of external validity only been about inference from sample to population, this would be no critical problem. But the really interesting inferences are those we try to make from specific labs/experiments/fields to specific real world situations/institutions/structures that we are interested in understanding or explaining. And then the population problem is more difficult to tackle.

Randomization – in search of a gold standard for evidence-based theories

Evidence-based theories and policies are highly valued nowadays. Randomization is supposed to best control for bias from unknown confounders. The received opinion is that evidence based on randomized experiments therefore is the best. More and more economists have also lately come to advocate randomization as the principal method for ensuring being able to make valid causal inferences.

Renowned econometrician Ed Leamer (2010) has responded to these allegations, maintaining that randomization is not sufficient, and that the hopes of a better empirical and quantitative macroeconomics are to a large extent illusory. Randomization promises more than it can deliver, basically because it requires assumptions that in practice are not possible to maintain:

> "We economists trudge relentlessly toward Asymptopia, where data are unlimited and estimates are consistent, where the laws of large numbers apply perfectly and where the full intricacies of the economy are completely revealed. But it's a frustrating journey, since, no matter how far we travel, Asymptopia remains infinitely far away. Worst of all, when we feel pumped up with our progress, a tectonic shift can occur, like the Panic of 2008, making it seem as though our long journey has left us disappointingly close to the State of Complete Ignorance whence we began.
>
> The pointlessness of much of our daily activity makes us receptive when the Priests of our tribe ring the bells and announce a shortened path to Asymptopia… We may listen, but we don't hear, when the Priests warn that the new direction is only for those with Faith, those with complete belief in the Assumptions of the Path. It often takes years down the Path, but sooner or later, someone articulates the concerns that gnaw away in each of us and asks if the Assumptions are valid… Small seeds of doubt in each of us inevitably turn to despair and we abandon that direction and seek another…
>
> Ignorance is a formidable foe, and to have hope of even modest victories, we economists need to use every resource and every weapon we can muster, including thought experiments (theory), and the analysis of data from nonexperiments, accidental experiments, and designed experiments. We should be celebrating the small genuine victories of the economists who use their tools most effectively, and we should dial back our adoration of those who can carry the biggest and brightest and least-understood weapons. We would benefit from some serious humility, and from burning our 'Mission Accomplished' banners. It's never gonna happen.
>
> Part of the problem is that we data analysts want it all automated. We want an answer at the push of a button on a keyboard… Faced with the choice between thinking long and hard versus pushing the button, the single button is winning by a very large margin.
>
> Let's not add a 'randomization' button to our intellectual keyboards, to be pushed without hard reflection and thought."

Especially when it comes to questions of causality, randomization is nowadays considered some kind of "gold standard". But just as econometrics, randomization is basically a deductive method. Given the assumptions (such as manipulability, transitivity, Reichenbach probability principles, separability, additivity, linearity etc) these methods deliver deductive inferences. The problem, of course, is that we will never completely know when the assumptions are right. As Nancy Cartwright (2007) formulates it:

> "We experiment on a population of individuals each of whom we take to be described (or 'governed') by the same *fixed causal structure* (albeit unknown) and *fixed probability measure* (albeit unknown). Our deductive conclusions depend on that very causal structure and probability. How do we know what individuals beyond those in our experiment this applies to?... The [randomized experiment], with its vaunted rigor, takes us only a very small part of the way we need to go for practical knowledge. This is what disposes me to warn about the vanity of rigor in [randomized experiments]."

Although randomization may contribute to controlling for confounding, it does not guarantee it, since genuine ramdomness presupposes infinite experimentation and we know all real experimentation is finite. And even if randomization may help to establish average causal effects, it says nothing of individual effects unless homogeneity is added to the list of assumptions.

Real target systems are seldom epistemically isomorphic to our axiomatic-deductive models/systems, and even if they were, we still have to argue for the external validity of the conclusions reached from within these epistemically convenient models/systems. Causal evidence generated by randomization procedures may be valid in "closed" models, but what we usually are interested in is causal evidence in the real target system we happen to live in.
So, when does a conclusion established in population X hold for target population Y? Usually only under very restrictive conditions! As Nancy Cartwright (2011) – succinctly summarizing the value of randomization - writes:

> "But recall the logic of randomized control trials… They are ideal for supporting 'it-works-somewhere' claims. But they are in no way ideal for other purposes; in particular they provide no better bases for extrapolating or generalising than knowledge that the treatment caused the outcome in any other individuals in any other circumstances… And where no capacity claims obtain, there is seldom warrant for assuming that a treatment that works somewhere will work anywhere else. (The exception is where there is warrant to believe that the study population is a representative sample of the target population – and cases like this are hard to come by.)"

Ideally controlled experiments (the benchmark even for natural and quasi experiments) tell us with certainty what causes what effects – but only given the right closures. Making appropriate extrapolations from (ideal, accidental, natural or quasi) experiments to different settings, populations or target systems, is not easy. "It works there" is no evidence for "it will work here." Causes deduced in an experimental setting still have to show that they come with an export-warrant to the target population/system. The causal background assumptions made have to be justified, and without licenses to export, the value of "rigorous" and "precise" methods is despairingly small.

Here I think Leamer's button metaphor is appropriate. Many advocates of randomization want to have deductively automated answers to fundamental causal questions. But to apply "thin" methods we have to have "thick" background knowledge of what's going on in the real world, and not in (ideally controlled) experiments. Conclusions can only be as certain as their premises – and that also goes for methods based on randomized experiments.

An interesting example that illustrates some of the problems with randomization – spillovers and the bridging of the micro-macro gap – was recently presented in an article by Pieter Gautier *et al.* (2012):

> "In new research, we study a Danish job search assistance programme which, according to a randomised experiment, leads to large positive effects on exit rates to work... We show, however, that because of spillover effects, a large-scale implementation will only marginally reduce unemployment without increasing welfare...
>
> The empirical results suggest that considering both negative and positive spillover effects is important when evaluating the job search assistance programme. The Danish programme essentially increases the job search effort of participants by requiring them to make more job applications. The effect on vacancy supply is modest, so when participants send out more applications, this reduces the probability that a specific job application gets selected.
>
> It is often argued that randomised experiments are the golden standard for such evaluations. However, it is well know that a randomised experiment only provides a policy-relevant treatment effect when there are no spillovers between individuals. In the study discussed above, we have shown that spillovers can be substantial. Despite the success of a small-scale implementation of the programme at the micro level, we find it to be ineffective at the macro level. The results of our study are no exception."

So this example does pretty well explain one reason for randomized controlled trials not at all being the "gold standard" that it has lately often been portrayed as. Randomized controlled trials usually do not provide evidence that their results are exportable to other target systems. The almost religious belief with which its propagators portray it, cannot hide the fact that randomized controlled trials cannot be taken for granted to give *generalizable* results. That something works somewhere is no warranty for it to work for us or even that it works *generally*.

Econometrics and the difficult art of making it count

In an article that attracted much attention, renowned econometrician and Nobel laureate James Heckman (2005) writes (emphasis added):

> "A model is a set of possible counterfactual worlds constructed under some rules. The rules may be laws of physics, the consequences of utility maximization, or the rules governing social interactions ... *A model is in the mind. As a consequence, causality is in the mind*."

Even though this is a standard view among econometricians, it is – at least from a realist point of view – rather untenable. The reason we as scientists are interested in causality is that it's a part of the way the world works. We *represent* the workings of causality in the real world by means of models, but that doesn't mean that causality isn't a fact pertaining to relations and structures that exist in the real world. If it was only "in the mind," most of us couldn't care less. The reason behind Heckman's and most other econometricians' nominalist-positivist view of science and models, is the belief that science can only deal with observable regularity patterns of a more or less lawlike kind. Only data matters, and trying to (ontologically) go beyond observed data in search of the underlying real factors and relations that generate the data is not admissable. All has to take place in the econometric mind's model since the real factors and relations according to the econometric methodology are beyond reach since they allegedly are both unobservable and immeasurable. This also means that instead of treating the model-based findings as interesting *clues* for digging deeper into real structures and mechanisms, they are treated as the *end points* of the investigation. Or as Asad Zaman (2012) puts it:

> "Instead of taking it as a first step, as a clue to explore, conventional econometric methodology terminates at the discovery of a good fit... Conventional econometric methodology is a failure because it is merely an attempt to find patterns in the data, without any tools to assess whether or not the given pattern reflects some real forces which shape the data."

David Freedman (2010) raises a similar critique:

> "In my view, regression models are not a particularly good way of doing empirical work in the social sciences today, because the technique depends on knowledge that we do not have. Investigators who use the technique are not paying adequate attention to the connection – if any – between the models and the phenomena they are studying. Their conclusions may be valid for the computer code they have created, but the claims are hard to transfer from that microcosm to the larger world.
>
> Given the limits to present knowledge, I doubt that models can be rescued by technical fixes. Arguments about the theoretical merit of regression or the asymptotic behavior of specification tests for picking one version of a model over another seem like the arguments about how to build desalination plants with cold fusion and the energy source. The concept may be admirable, the technical details may be fascinating, but thirsty people should look elsewhere."

Most advocates of econometrics and regression analysis want to have deductively automated answers to fundamental causal questions. Econometricians think – as David Hendry expressed it in *Econometrics – alchemy or science?* (1993) – they "have found their Philosophers' Stone; it is called regression analysis and is used for transforming data into "significant' results!" But as David Freedman (2010) poignantly notes – "Taking assumptions for granted is what makes statistical techniques into philosophers' stones." To apply "thin" methods we have to have "thick" background knowledge of what is going on in the real world, and not in idealized models. Conclusions can only be as certain as their premises – and that also applies to the quest for causality in econometrics and regression analysis.

Without requirements of depth, explanations most often do not have practical significance. Only if we search for and find fundamental structural causes, can we hopefully also take effective measures to remedy problems like e.g. mass unemployment, poverty, discrimination and underdevelopment. A social science must try to establish what relations exist between different phenomena and the systematic forces that operate within the different realms of reality. If econometrics is to progress, it has to abandon its outdated nominalist-positivist view of science and the belief that science can only deal with observable regularity patterns of a more or less law-like kind. Scientific theories ought to do more than just describe event-regularities and patterns – they also have to analyze and describe the mechanisms, structures, and processes that give birth to these patterns and eventual regularities.

Modern econometrics is fundamentally based on assuming – usually without any explicit justification – that we can gain causal knowledge by considering independent variables that may have an impact on the *variation* of a dependent variable. This is however, far from self-evident. Often the *fundamental* causes are *constant* forces that are not amenable to the kind of analysis econometrics supplies us with. Or as Stanley Lieberson (1985) has it:

> "One can always say whether, in a given empirical context, a given variable or theory accounts for more variation than another. But it is almost certain that the variation observed is not universal over time and place. Hence the use of such a criterion first requires a conclusion about the variation over time and place in the dependent variable. If such an analysis is not forthcoming, the theoretical conclusion is undermined by the absence of information...
>
> Moreover, it is questionable whether one can draw much of a conclusion about causal forces from simple analysis of the observed variation... To wit, it is vital that one have an understanding, or at least a working hypothesis, about what is causing the event *per se*; variation in the magnitude of the event will not provide the answer to that question."

Our admiration for technical virtuosity should not blind us to the fact that we have to have a more cautious attitude towards probabilistic inference of causality in economic contexts. Science should help us penetrate to "the true process of causation lying behind current events" and disclose "the causal forces behind the apparent facts" (Keynes (1971-89), **XVII**). We *should* look out for causal relations, but econometrics can never be more than a starting point in that endeavour, since econometric (statistical) explanations are not explanations in terms of mechanisms, powers, capacities or causes. Firmly stuck in an empiricist tradition, econometrics is basically concerned with the *measurable* aspects of reality. But there is always the possibility that there are other variables – of vital importance and, although perhaps unobservable and non-additive, not necessarily epistemologically inaccessible – that were not considered for the model. Those who *were* can hence never be *guaranteed* to be more than potential causes and not real causes.

A rigorous application of econometric methods in economics really presupposes that the phenomena of our real world economies are ruled by stable causal relations between variables. A perusal of the leading econometric journals shows that most econometricians still concentrate on fixed parameter models and that parameter values estimated in specific spatio-temporal contexts are simply *assumed* to be exportable to totally different contexts. To warrant this assumption one, however, has to convincingly establish that the targeted acting causes are stable and invariant, so that they maintain their parametric status after the

bridging. The endemic lack of predictive success of the econometric project indicates that this hope of finding fixed parameters is a hope for which there really is no other ground than hope itself.

Keynes's (1951(1926)) critique of econometrics and inferential statistics was based on the view that real world social systems are not governed by stable causal mechanisms or capacities:

> "The atomic hypothesis which has worked so splendidly in Physics breaks down in Psychics. We are faced at every turn with the problems of Organic Unity, of Discreteness, of Discontinuity – the whole is not equal to the sum of the parts, comparisons of quantity fails us, small changes produce large effects, the assumptions of a uniform and homogeneous continuum are not satisfied. Thus the results of Mathematical Psychics turn out to be derivative, not fundamental, indexes, not measurements, first approximations at the best; and fallible indexes, dubious approximations at that, with much doubt added as to what, if anything, they are indexes or approximations of."

The kinds of laws and relations that econometrics has established, are laws and relations about entities in models that presuppose causal mechanisms being atomistic and additive. When causal mechanisms operate in real world social target systems they only do it in ever-changing and unstable combinations where the whole is more than a mechanical sum of parts. If economic regularities obtain they do it (as a rule) only because we engineered them for that purpose. Outside man-made "nomological machines" they are rare, or even non-existent. Unfortunately that also makes most of the achievements of econometrics – as most of contemporary endeavours of economic theoretical modeling – rather useless.

Conclusion

Statistics and econometrics should not – as already Keynes (1973(1921)) argued – primarily be seen as means of inferring causality from observational data, but rather as descriptions of patterns of associations and correlations that we may use as *suggestions* of possible causal relations.

Causality in social sciences – and economics – can never solely be a question of statistical inference. Causality entails more than predictability, and to really in depth explain social phenomena require theory. Analysis of variation – the foundation of all econometrics – can never in itself reveal *how* these variations are brought about. First when we are able to tie actions, processes or structures to the statistical relations detected, can we say that we are getting at relevant explanations of causation. Too much in love with axiomatic-deductive modeling, neoclassical economists especially tend to forget that accounting for causation – *how* causes bring about their effects – demands deep subject-matter knowledge and acquaintance with the intricate fabrics and contexts.

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Money as gold versus money as water

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Abstract
The rules of the Eurozone cause the euro to function as the gold standard. The US economy performs better in some respects, partly because of the advantages of fiat money. The treaty on the EMU has to be adapted in order not to become dependent upon current ad hoc measures, with the loss of welfare over the years 2008-2013+. If Eurozone nations create their own national Economic Supreme Courts, then an optimal currency area can still come about without transfer to Brussels of national sovereignty on the budget. When consumers and agents can have deposits at a local branch of the European Central Bank, a system of deposit insurance has been established by itself. Advisable is a split-up between (1) the primary payment system with retail banks that are franchises of the ECB, (2) the secondary savings and loans banks, and (3) the tertiary investment banks. The shadow banking system must be redressed, with every financial transaction having an identified regulation. Conforming to an earlier proposal the ECB can create funds to redress debt. Notably, 400 billion euro can be created and invested in bank capital, and be directly neutralised by the capital requirement of 10.5%. Another 400 billion can be used to clean up the debt of Greece and Italy. Their participation in the Eurozone was a political decision and thus the Eurozone must bear the consequences. To satisfy the no-bailout-condition, Greece and Italy could create economic zones comparable to the lease of Hong Kong, where companies could invest and operate under international law for the next 40 years.

JEL codes E00, A10, P16

Keywords Economic stability; monetary policy; economic crisis; euro; European Central Bank; bank capital; risk free rate; fiscal policy; tax; external balance; Economic Supreme Court; optimal currency area; investment; investment banks; Banking Union

Introduction

The Great Depression 1929-1940 led many economists to conclude that the gold standard is too rigid. John Maynard Keynes spoke about a *barbaric relic*. In 1944 in Bretton Woods the nations still kept a link to gold but in 1971 President Richard Nixon closed the gold window with such force that it ought to be clear by now: what works for a modern economy is fiat money. This kind of money can be printed as desired, or created electronically by a push on a button.

We thus have money like water. Its scarcity is artificial and managed by the system. The economic value of fiat money is based upon the reliability of the Central Bank plus the requirement for agents to pay tax in that denomination. Rules and contracts in terms of legal tender are enforceable by law.

Regulators understand very well that it would be so easy to abuse the printing press, whence they create a rigid system that blocks such abuse, and in some cases they recreate the gold standard. The rules of the Eurozone cause the euro to function as the gold standard indeed. The US does much better, though various economists point out that the US government doesn't apply the instrument of fiat money as intelligently as it could. Some policy makers apparently do not understand that we actually have money as water. Thus we see a

somewhat perverse coalition of *"understanding too well"* and *"not understanding at all"*, which coalition prevents the wise use of the monetary instrument that Keynes was in favour of.

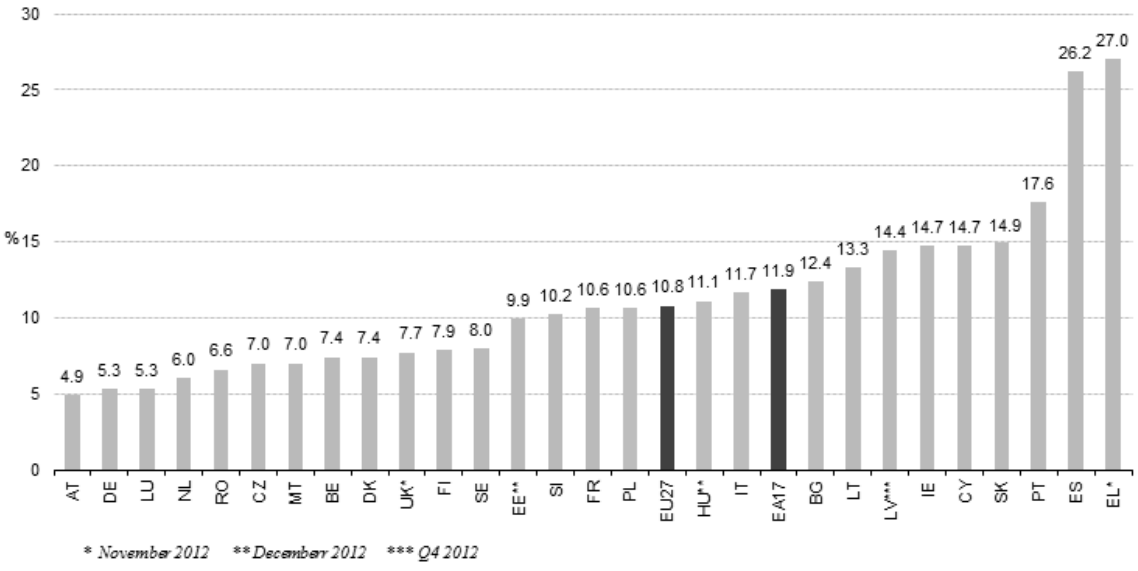
The challenge lies in the middle ground, i.e. both to block the abuse, and to get rid of the mental cage of that *barbaric relic* indeed. The suggestion in this paper isn't to just print money and run the risk of inflation. While the ECB has a target of 2% inflation my position is that 0% would be better. If we have 2% inflation in one year, the target next year should be -2%. But unemployment better lies at 1% friction rather than 25% as is now the case is some countries in the EU.

Below, we will look at the cost of the *de facto* gold standard for Europe. We will consider how Milton Friedman's monetarism is linked to the current misunderstanding, and why monetarism is of limited value. We subsequently look at the core issue of deposit insurance. We close with a review of an *Economic Plan for Europe* (September 2011) and with some points on the economic order itself and the issue of democratic accountability.

The cost of the Eurozone *de facto* gold standard

The Eurozone has a hybrid monetary system since it has the additional goal that *bailouts* are forbidden. The core example is that Greece used to be able to print drachmas, but cannot do so with euros. It is proper that one country cannot print euros at the cost of others, but the size of the crisis shows that we must rethink some of the logic involved. The blockage against a bailout has been mixed with thinking in terms of a gold standard. When governments are forced to austerity programs that cause a deflationary spiral, then something is amiss. Eurostat (2013) mentions unemployment in most countries above 7%, in Ireland 15%, Portugal 18% and Spain can Greece above 25%, see Figure 9.

Figure 9. Unemployment rates, seasonally adjusted, January 2013 (Eurostat (2013))



Is this cost necessary or could it be avoided? A point of reference would be the USA with 7.9% unemployment in January 2013. The USA might have all the advantages of fiat money, though curiously doesn't use all of them. Before we look into this, let us first consider monetarism. Sound money has strong roots in Europe but in the American Century it was the American Milton Friedman who became its champion.

The limited value of Milton Friedman's monetarism

The reader will understand this discussion better by reading Robert Gordon (ed) (1970, 1974), a collection of articles from the *Journal of Political Economy* of the University of Chicago about Milton Friedman's monetary analysis, with critics and his *rejoinder.* Friedman adopts terminology of Keynes and thus contributes to confusion. Friedman stated "We are all Keynesians now" while his theory in fact is non-Keynesian. The collection clearly shows that Friedman worked in a classic world with timeless tâtonnement and has little patience for the dynamics in Keynes's analysis. A follower of Friedman has to be taken along a *random walk* before he or she may grasp what fundamental uncertainty is. The monetarist concept of a ("rationally expected") "long term equilibrium" is nice as a theory, but its application to reality is not warranted. At this juncture in time that theory is definitely refuted and counterproductive.

A relevant issue to consider is Paul Volcker's decision in 1979 to fight inflation, in his own words via a Friedman-policy of a fixed stock of money, as if it were gold. Unemployment and the rate of interest rose quickly, and inflation disappeared indeed. Paul Weaver (1994:95-98) explains how the general public was misled by journalistic laziness. Journalists can blame the recession on Volcker or write that he can't be blamed when the stock of money is fixed like with gold. Public relations and the stories that journalists tell are relevant because we are dealing with expectations of the economic agents. Still, it is preferable that the monetary authorities present a sound analysis and do not contribute to confusion and laziness. Volcker actually should have admitted that he raised the rate of interest and caused the recession.

Relevant for the ECB is Issing (2003) on the two pillar strategy and Goodhart (2006) on the mixed results. Below we will see that money velocity is much lower than in the past while consumer price inflation is very stable. Apparently the markets have different portolio choices, though there are always accounting issues (notably from transactions that cause deposits). With the effect on house prices, we may also doubt the notion of CPI inflation. The main point is that we better consider money from a wider angle than monetarism.

Modern Monetary Theory

The MMT Wiki (2013) gives access to a discussion on "Modern Monetary Theory" (MMT) and D'Souza (2013) is a video that tries to explain some main issues to a general audience. It is fine that there is discussion, which shows only the value of an open society. A downside is that there would not be a "definitive textbook" that explains what it all comes down to. There are textbooks on Newton's theory of gravity and Einstein's theory of relativity, so that students can get a grasp of what is intended, even though physicists still have all kinds of discussions on details. Apparently the economics profession has not succeeded in getting the notion of

fiat money established in such manner, that people can grasp the essentials in clear fashion. (I would protest if that video would be hailed for being this grasp of essentials.)

A key criterion would be that basic theory would also be embraced by the Central Banks of Europe and the US, so that the authorities can explain the issues and the wiki would only need to discuss further details. Perhaps the best thing that Ben Bernanke could do, after saving the world from disaster in 2007-2011, is take a sabbattical and write that textbook, so that the world can finally converge on common wisdom.

A problem in the US is that the US Federal Reserve is owned by the private banking system itself, and only falls under some national regulatory laws by the US Government. This creates conceptional distortions about what money is. A key point is that the US system of accounting suggests that the government borrows money from the banks and is indebted to the banks, while in fact the government has created money itself and while there is no debt but merely an instrument to make the economy run smoothly. In some respects, though, the US is more advanced on the notion of fiat money, compared to the European system of accounting, see Colignatus (2005).

Overall, it would be advisable that the G20 agrees that all countries resort to a system in which the Central Bank is owned by the central government, and in which fiat money is accounted for by the government as an instrument and not as a debt to society.

Deposit insurance

One of the questions concerns the design of a European system of deposit insurance. A modern economy relies on a system of payments, in which one must make sure that the money doesn't disappear because of some bankruptcy. This is a public service. It is logical that this system of payments falls under the governance of the Central Bank. Who deposits money at the CB need not worry about whether it is safe. If a withdrawal is required, the CB can always print money. The CB must have internal separations between management, surveillance and monetary policy.

Clearly, the payment system from Berlin to Malaga is huge, with wage bills and consumer transactions, but the ECB can set up franchises that can compete on customer service. Salaries in this system are like for normal civil servants. Obviously, the system will require a high degree of internal inspection, since fiat money on a computer is fairly easy to cheat with. The latter is no different than from current banks, albeit that a private bank looks after its own money and civil servants look after public money.

The costs of the payment system can be covered by a tiny levy on transactions and by *seigniorage*, the difference between the costs of creating money and its value in use, see Colignatus (2005). Let us consider the equation of exchange by Irving Fisher $P\ Y = M\ V$, and momentarily assume constant speed V. The quantity of money M can rise by 2% when income Y rises by 2%, when inflation is zero or P rises by 0%. Thus we have 2% of the stock of money to pay salaries to the civil servants who run the payment system, or pay out a low rate of interest to the deposits. Having the payment system run by the CB also allows to adjust deposits for inflation and deflation – though this is a more complex discussion.

We find some key data in Table 1 below. For *M* we take M1 = currency, travellers' cheques, demand deposits, other checkable deposits. Somewhat surprisingly, the velocity of M1 has been reducing much in the last 12 years, from 3.4 in the year 2000 to 1.9 now.

The indices for real GDP (*Y*) and inflation *(P*) can be set at 2012 = 1. We find that the Eurozone real GDP was higher in 2007 and 2008 than last year. The percentage change of real GDP gives production growth (d*Y*/*Y*, column 6). Note that *P* or the price index of GDP (column 7) differs from the consumer price index (column 10).

The Eurostat national accounts (NACE), financial services division 65, for financial intermediation (excluding insurance and pensions 66 and brokers 67) are curiously incomplete, with e.g. data lacking for Luxemburg. A guesstimate for the Eurozone is an employment of 2.5 million persons.[1] This gives column 11.

Table 1: *P.Y* = *M.V*, Eurozone (17 countries), billions of euros [2]

1	2	3	4	5	6	7	8	9	10	11
Year	M1	P.Y	V=PY/M	Y=GDP	dY/Y	P	dP/P	HICP	Pc	dM/2.5
2000	2024.7	6783.6	3.4	0.885		0.808			0.774	
2001	2222.3	6783.6	3.1	0.903	2.0	0.792	-2.0	2.4	0.793	79.0
2002	2442.7	7330.4	3.0	0.911	0.9	0.849	7.1	2.3	0.811	88.2
2003	2681.4	7546.8	2.8	0.917	0.7	0.868	2.2	2.1	0.828	95.5
2004	2905.3	7860.1	2.7	0.937	2.2	0.884	1.9	2.2	0.846	89.6
2005	3422.8	8145.2	2.4	0.953	1.7	0.901	1.9	2.2	0.865	207.0
2006	3697.5	8564.4	2.3	0.984	3.2	0.918	1.9	2.2	0.884	109.9
2007	3839.4	9029.7	2.4	1.013	3.0	0.940	2.4	2.1	0.902	56.8
2008	3990.4	9241.6	2.3	1.017	0.4	0.958	1.9	3.3	0.932	60.4
2009	4500.1	8920.2	2.0	0.973	-4.4	0.967	1.0	0.3	0.935	203.9
2010	4704.6	9176.1	2.0	0.992	2.0	0.975	0.9	1.6	0.950	81.8
2011	4799.5	9421.2	2.0	1.006	1.4	0.987	1.3	2.7	0.976	38.0
2012	5105.4	9483.4	1.9	1.000	-0.6	1.000	1.3	2.5	1.000	122.4

Consider for example the change in M1 from the year 2000 to the year 2001. The change was almost EUR 200 billion, or 200 times 10^9. When we divide this by 2.5 times 10^6 then we get 200,000 / 2.5 = 80,000 per person. Using the proper value we find that a salary of EUR 79 thousand per person could have been paid to the employees the Eurozone credit system, merely by seiniorage.

[1] http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tin00016&plugin=1

[2] HICP = harmonized consumer price index change
M1: ecb: http://www.ecb.europa.eu/stats/money/aggregates/series/html/index.en.html
GDP nominal prices: bsi_hist_sa_u2_1.pdf and GDP at market prices, current prices (tec00001)
http://epp.eurostat.ec.europa.eu/portal/page/portal/national_accounts/data/main_tables
http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=tec00118&tableSelection=1&footnotes=yes&labeling=labels&plugin=1
Real GDP growth rate - volume (tec00115) MIO_EUR_CLV2005
http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00115

Currently, seiniorage is created within the banking system and used to cover various costs, not specifically employment. The cost of employment is paid for though, and thus from other resources. Thus it would entail a switch indeed, to cover the employment costs of a new ECB payment system by seiniorage. The banking system could cover the various other costs from the various other resources, that apparently are available. Apparently the conceptual switch seems feasible. Over the 12 year period we can find a relatively high average income, even when velocity is about constant around the value of 2. As said, that new ECB payment system will have other costs, and a small transaction fee would tend to be required.

The other branches in the financial system

Institutionally separated from the payment system, there are the secondary savings and loans and the tertiary investment banks. Higher risk comes with higher rates of interest. The shadow banks will have to be redressed. All these banks ought to be relatively small with respect to the market, such that there is more competition, that helps to keep salaries in check.

The redress of the shadow banks (or shadow activities in known banks) means that every financial transaction must have an identified regulation. Credit default swaps must be forbidden since they create the illusion of the same security as money itself, while money is the monopoly of the Central Bank. Many financial products make eminent sense, e.g. a life insurance of a wage earner, such that a mortgage can be paid and the widow or widower doesn't have to sell the house. The key point is to separate sense from nonsense. Since the current system of money and finance is badly designed anyway, even sensical products can produce counterproductive effects. Having a sound system of money and finance will help to separate sense from nonsense.

Essential for growth (i.e. environmentally sustainable, see Hueting (2012)) is that there are countercyclical investment banks. Such banks study potential projects in the boom period and invest in the bust period (and sell such projects again in the boom period). Pollock and Letta (2001) confirm that the causality runs from expenditures to income, and less in the reverse. Keynes's *General Theory* was also intended for entrepreneurs, see Fanning & O Mahony (2000). The current policy in the EU is austerity in the hope of a return of 'confidence', such that markets will start to invest again. This current policy runs counter to what Keynes called the *animal spirits.* Confidence leaves on horseback and returns on foot. In that long run, or rather tip-toeing, we are all dead, Keynes explained as well. Hence we need investment plans, as Tinbergen was also clear in explaining. The required investment banks need not be bureaucratic, of course, since we are speaking about creating a market. One could start studying the issue by considering the pamphlet by Mazzucato (2011).

A historical perspective

The current monetary and financial system has grown from history. Gold is scarce. For a commercial bank it costs money to store gold or even paper money. It seems attractive to lend and hope for the best, since each loan creates its own deposit. As the current system developed, it had various crashes along the way, so there also developed a system of regulation. Ratio's for reserves and liquidity came into being, and because of the Great

Depression also deposit insurance. If deposit insurance is seen as 'insurance' then it is costly indeed.

The current system is like the invention of the automobile but with the imposition of "conservative" regulations. At first the authorities require that each car is drawn by a horse, with the unintended effect that also weak horses can "pull the car". A second innovation is that the horses may also be put in a stable, provided that the car user pays for hay and oat. Curiously, the current system is defended strongly by "conservative thinkers" who insist on the reliability of the gold standard, and who are very much against economic inefficiency, but who do not see how quaint both the gold standard and the current system are.

For a new monetary and financial system we would start from the notion that for a Central Bank it is a senseless notion that money would be scarce, since it can always be created. There is also no cost to deposit insurance since money can always be created.

The creators of the current system over the centuries thus didn't put the security of the customers in first place. They were confronted with a developing banking system, that needed some control, and they had little theory to guide them. They gave priority to the access of banks to commerce and profit, where banks collect the seiniorage, and where banks can shift bankruptcies onto the community. The theory that the academia created, like monetarism, fitted this system while alternatives apparently didn't merit much attention. Keynes's approach seems to have had a period of popularity in 1945-1965, but the professors on money and banking apparently made sure that the gold standard still remained the teaching standard.

We see the same confusion with respect to "system banks". The EU decided last December that there will be a Banking Union in which European system banks will be monitored. The details still are under discussion, see the proposals by the EU Commission (2012). The big banks thus have managed to create more distance from their national governments and the risk of nationalisation and the risk of being split up. The solution however lies in a system with safe deposits at the Central Bank and the splitting up of the second and third tiers.

The economic order

The analysis in this paper assumes a somewhat different economic order than conventionally thought. Conventionally, there is the Trias Politica with the checks and balances of the Executive, Legislative and Judiciary branches. Subordinate to these branches is a Council of Economic Advisors (USA), Sachverständigenrat (Germany), Commissariat du Plan (France), Central Plannning Bureau (Holland), Office of Budget Responsibility (UK). We can observe empirically that subordinate planning doesn't work well, which is why Germany insists upon constitutional guarantees of a balanced budget. The latter however is needlessly rigid. It is also illogical.

A balanced budget doesn't solve the key problem that this budget might be based upon wrong information and illusionary thinking.

The proper solution is a Tessera Politica, in which there is an Economic Supreme Court (ESC), at the same level as the other branches of Montesquieu's government. This ESC cares for scientifically checked information. The political branches still determine how the resources are allocated but they lose the opportunity to manipulate the information. The

concept of the ESC wa presented originally in 1992, see now a text for a constitutional amendment in Colignatus (2011a), abbreviated as DRGTPE.

An unintended consequence of this development of concept is that it is very likely that Robert Mundell's *optimal currency area* can still function, if each nation has its own national ESC, without the transference of souvereignty to some central authority. As such, this is a conjecture without rigorous proof. Nevertheless, it can be suggested to the Eurozone countries to start working in that manner, as a matter of economic common sense. National economic scientists are in a much better position than bureaucrats (i.e. non-scientists) from (distant) Brussels (and lacking national prestige), to indicate problems in a national budget. Countries will grant veto power more easily to a national ESC than to Brussels, and it will have real meaning, rather than some "financial punishment" (that adds to the problems).

A key example is the export surplus of Holland, later copied by Germany. The policy of Northern Europe is to impose wage restriction and thus generate growth and jobs via exports. This is an excellent way to shoot yourself in the foot. The surplus of the North is the deficit of the South. The North has to loan the surplus to the South, and the South has the option to invest or to consume. When mal-investment in the South causes depressing sights of half-built homes, airstrips and factories, we might perhaps be relieved that much went into consumption. Clearly, Economic Supreme Courts in the North would have vetoed the wrong information and political disinformation that underlies this Northern low wage policy.

Eventually there is scope for a world currency. It would be fortunate if the Eurozone would develop what would be needed in practice to allow the world to adopt a scheme that would sustain world governance and national sovereignty.

An economic plan for Europe (September 2011)

The instrument of money can be used in a targetted manner to eliminate bottlenecks that contribute to stagnation. In this line of thinking, I earlier proposed an *Economic Plan for Europe*, Colignatus (2011b) and a suggestion for reforming the EMU, Colignatus (2011c). These two papers have been included in the book Colignatus (2012), *Common Sense: Boycott Holland.* Elements in that Economic Plan for Europe were:

(1) EUR 400 billion can be used by governments to increase the capital base of banks, by taking shares. As that capital will be put in the ECB under the 10.5% reserve requirement, it is neutralised on the spot.

(2) Another 400 billion can be used to clean up the debt of Greece and Italy. This is neutralised as a balance sheet correction too. To satisfy the no-bailout-condition, Greece and Italy could create economic zones comparable to the lease of Hong Kong, where companies could invest and operate under international law for the next 40 years.

Thus the ECB can create 800 billion euro and neutralise it within the system such that there is no effect on inflation. These earlier papers used the property of fiat money, but the present paper gives a better outline about what fiat money is.

An author should hesitate to solve the same problem multiple times in multiple ways, but a certain amount of flexibility helps against the suspicion of dogmatism. I would like to emphasise, perhaps in defence, that there are different elements involved in the various solutions to the same problem. This present paper for example discusses deposit insurance, which element is not central to the earlier papers. We nevertheless have a double solution now. Colignatus (2011b) suggested to create EUR 400 billion from the printing press to raise bank capital, while this might no longer be needed if the banks are split up and the payment system is brought under ECB control. I don't consider this a serious inconsistency, even though some readers might consider EUR 400 billion to be serious money. My suggestion is to consider the logic of the argument. The key point is that fiat money creates a wealth of options to choose from, so that the real argument is to choose wisely.

Some details about that plan

Without explanation, it might sound too simple, to just print EUR 400 billion and resolve the insolvencies of the banks. It is useful to consider some details, to see why the properties of fiat money make it a key economic instrument (which instrument is destroyed when money is regarded as gold or gold is regarded as money).

(ad 1) The current ECB policy towards recovery requires banks to write-off bad loans and to replenish their capital to 10.5%. A consequence is that banks tend to prop up bad loans as if they were good loans, to the detriment of new initiatives in the real economy. The ECB has a policy of cheap money for banks so that they can make profits to prop up their capital requirement, which is a hidden subsidy that might as well be faster and in the open. The current policy doesn't help real companies that need cheap credit. The ECB policy is targetted on the financial system and blind to the real economy. The policy relies again on the idea of restoring 'confidence', but thus is based upon fallacies, and it neglects the counterarguments.

(ad 2) The participation of Italy and Greece in the Eurozone was a political decision and thus the Eurozone must bear the consequences. Commercial banks have continued to loan to Greece even though they should have checked where the money went to. Europe has let this happen. The debt is so large that some annulment is unavoidable. Asking private parties to bear the burden of that annulment would turn Eurozone government debt unreliable. Under the rules of the EMU country debt now starts to require a risk premium, see Colignatus (2011c). Normally, government debt is 100% safe because the Central Bank can always print money. Therefore, we can find the solution there too. The ECB can create EUR 100 billion for Greece and EUR 300 billion for Italy. Would this be a bail-out? The countries have various options. Greece and Italy might consider a capital tax to capital owners, like is common in Northern Europe. The suggested lease is an alternative that many might consider wiser.

Democratic accountability

The earlier papers established that the ECB could technically create that EUR 800 billion. The decision to actually do so would be political, and likely be taken by the Eurozone Council of Heads of State and Government, after preparation by the eurogroup ministers of Finance.

An important point is democratic accountability and control. With more democratic transparancy, there might be more public discussion about the use of fiat money to resolve the crisis. Perhaps it is the lack of democratic accountability that causes that policy makers regard the euro as gold. Thus, it may be a bit of a tragedy, that lack of democracy causes policy makers to choose solutions that cause even less democracy.

The EU and the Eurozone countries agree that the current arrangements are not working. Policy makers are developing an ESM, a Banking Union, a European semester, and more ways with tighter supervision. The present paper calls attention to the phenomenon that policy makers still tend to treat the euro as gold, and thus neglect that it is primarily a monetary and financial instrument. A greater awareness of this will help the EU to design better arrangements.

In the new EMU treaty, more attention must be given to the countervailing power to Eurozone policy and the ECB. While the EU already has the European Parliament, the Eurozone would need a separate parliament too, since tighter control on the budgets of the euro countries would require a compensating control by voters. The problem would be simpler if countries had their own Economic Supreme Courts, for it is difficult to try to correct at a higher level what already has gone wrong at a lower level. If each country has its own national Economic Supreme Court, so that the control of the budget remains at the national level, then there would be no real need for a separate Eurozone parliament.

We see the same processes for the whole EU as for the Eurozone. The crisis causes a tendency towards convergence in policy making circles and a tendency towards divergence amongst the voters. The UK historically had difficulty with the German-French combination in the EU, and one may conjecture that the UK only joined so as to influence the EU toward a common trade area rather than “an ever closer union”. In itself it would be very wise of the EU to stick to its unique selling point of being a common trade area, since the peoples of Europe are different with their own national histories. To focus on a common trade area that includes Russia and Turkey would be a great idea. That issue is of a political nature, naturally. The point here, however, is that the economic crisis in Europe is partly a monetary artifact, derives from monetary architecture and competence. It would be unwise to let one’s political choices about the future of Europe be determined by (such) lack of command of economic theory.

Conclusion

The rules of the Eurozone cause the euro to function as the gold standard. This is an important causal factor for the stagnation in Europe, now with low or negative growth of production and high unemployment, in most countries above 7%, in Ireland 15%, Portugal 18% and Spain can Greece above 25%. The US economy performs better in some respects, partly because of the advantages of fiat money. The Eurozone can get these advantages too when it can release itself from the present *de facto* gold standard. The treaty on the EMU has to be changed in order not to become dependent upon current ad hoc measures, with the loss of welfare over the years 2008-2013+. When consumers and agents can have deposits at a local branch of the European Central Bank, a system of deposit insurance has been established by itself. Advisable is a split-up between (1) the primary payment system with retail banks that are franchises of the ECB, (2) the secondary savings and loans banks, and (3) the tertiary investment banks. The shadow banks must be redressed, with every financial transaction having an identified regulation. Credit default swaps must be forbidden since they

create the illusion of the same security as money itself, while money is the monopoly of the Central Bank. This paper refers to earlier proposals of how the ECB can create 800 billion euro with a push of a button to redress the debts of the banks and of Italy and Greece. Notably, 400 billion euro can be created and invested in bank capital, and be directly neutralised by the capital requirement of 10.5%. The other 400 billion can be used to clean up the debt of Greece and Italy. Their participation in the Eurozone was a political decision and thus the Eurozone must bear the consequences. To satisfy the no-bailout-condition, Greece and Italy could create economic zones comparable to the lease of Hong Kong, where companies could invest and operate under international law for the next 40 years.

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Constant returns to scale: can the market economy exist?

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Abstract
This note argues that the competitive paradigm of neoclassical economics breaks down in the presence of constant returns to scale (CRS). With CRS, all goods can be produced at identical unit costs by all economic agents, making self-production a feasible alternative to market production. In the event, an infinite number of equilibria become possible with a mix of markets and self-production. If labor is the only factor of production, self-production is the only option and the market economy ceases to exist.

All too often the competitive paradigm of neoclassical economics has been faulted for its unrealistic assumptions, but rarely for logical inconsistency. These critics have also developed several new variants of economics based on more realistic assumptions.[2] Nevertheless, these critiques have failed to dislodge the competitive paradigm from its preeminent position in economics. Kenneth Arrow (1994: 451) has argued that this is because the competitive paradigm "is still the only coherent account of the entire economy." Others point to the ideological function of neoclassical economics: in particular, its defense of the capitalism of unfettered markets.[3]

This note presents a different critique: it shows that the competitive paradigm is inconsistent with constant returns to scale (CRS). At least since Leon Walras, economists have constructed mathematical models to establish the exact conditions under which a market economy – with fixed resources, tastes and technology – can attain an equilibrium that is also Pareto-efficient. CRS – or the more general assumption of non-increasing returns to scale – has been a cornerstone of all these models. Allyn Young (1928) and later Nicholas Kaldor (1967 and 1972) have shown that equilibrium economics becomes irrelevant in the presence of increasing returns to scale. We argue that neoclassical economics is in trouble even *with* CRS: and this is a problem that has gone unnoticed. Our concern is not with the existence – or uniqueness and stability – of solutions to the system of equations that define the neoclassical economy. Instead, we ask a more basic question. Can a *market* economy exist in the presence of CRS?

A short note might suffice to answer this question, but lest it become too short we will start with the mercantilists and Adam Smith. This digression will provide some historical

[1] The author wishes to acknowledge comments on this paper from Salim Rashid, Professor Emeritus at University of Illinois, Urbana-Champaign; James Dana, Professor of Economics and Strategy, Northeastern University; Bill Dickens, University Distinguished Professor, Northeastern University; and Asad Zaman, Professor of Economics, International Islamic University, Islamabad. The usual disclaimer applies: only I am responsible for the contents of this paper.
[2] A list of these new approaches might include the old and new institutional economics, behavioral economics, the economics of limited information, evolutionary economics, and the applications of game theory to the study of strategic behavior.
[3] In his Nobel lecture, Joseph Stiglitz (2001) writes that "one cannot ignore the possibility that the survival of the [neoclassical] paradigm was partly because the belief in that paradigm, and the policy prescriptions, has served certain interests." Others explain its ascendancy in the late nineteenth century as a reaction to the radical ideas of Karl Marx. For instance, James Tobin (1985: 30-31) writes, "In positive as well as normative theory, neoclassical economics was in a much better position than classical economics to respond to the Marxist challenge."

perspective on how CRS became one of the cornerstones of neoclassical economics. A little history cannot hurt even in a discipline that does not take too kindly to history.

1. Classical economics

A central purpose of Adam Smith in writing the *Wealth of Nations* was to make the case for laissez faire and, thereby, discredit the mercantilists. It is therefore ironic that he should open his treatise on political economy with a central insight from mercantilists regarding the power of increasing returns to scale in manufacturing.

"The greatest improvement," writes Adam Smith, "in the productive powers of labor, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labor." Division of labor contributes to labor productivity in at least four ways: augmenting worker skills, saving time lost in moving from one task to another, increasing use of machines, and reducing the time they are idle.[4] Perhaps, the increasing use of machinery is the most important source of productivity gains that flow from division of labor: it "enable[s] one man to do the work of many." In pin manufacturing, according to Adam Smith, the average output of each man - working as part of a team of ten workers - is 4,800 pins per day; working independently "they certainly could not each of them have made twenty, perhaps not one pin in a day."[5] The returns to scale in pin-making are quite extraordinary: division of labor increased the output of each worker by a multiple of 240. It is worth noting that these gains were attained without the use of any external sources of energy.

Adam Smith makes it clear that these productivity gains in pin making were not exceptional. "In every other art and manufacture," he writes, "the effects of the division of labor are similar to what they are in this trifling one; though, in many of them, the labor can neither be so much subdivided, nor reduced to so great a simplicity of operation. The division of labor, however, so far as it can be introduced, occasions, in every art, a proportionate increase in the productive powers of labor." Agriculture did not benefit from these productivity gains; the division of labor in this sector was limited by the sequential nature of many of its operations.[6] Although he does not elaborate, Adam Smith clearly grasped the dynamic implications of the division of labor. "As it is the power of exchanging," he writes in chapter three of his treatise, "that gives occasion to the division of labor, so the extent of this division must always be limited by the extent of that power, or, in other words, by the extent of the market."[7] If a two-way feedback existed between the division of labor and the size of markets, this was likely to create a virtuous circle of growth. Moreover, since the division of labor operated more strongly in manufactures than in agriculture, this necessarily made the former the engine of growth. This is not where Adam Smith wanted to go, however, since it led straight into mercantilist territory.[8]

Having started on the wrong foot, Adam Smith quickly gave up further talk of division of labor.

[4] Adams Smith identified the first three.
[5] Adam Smith (1776/1975): 3,7.
[6] Smith (1776/1975): 5-6.
[7] Smith (1776/1975): 17. Allyn Young (1928: 529) has written that this was "one of the most illuminating and fruitful generalizations which can be found anywhere in the whole literature of economics."
[8] Antonio Serra (2011: 121), an Italian writer of the early seventeenth century writes, "In manufacturing, production can be multiplied not merely twofold but a hundredfold, and *at a proportionately lower cost* (emphasis added)."

This was not the foundation on which he could build his critique of dirigisme; he would have to change his focus.[9] And this he did in a hurry. After spending the first three chapters of *The Wealth of Nations* discussing foreign trade, size of markets, productive powers and the division of labor, in chapter four he fixes his attention on price theory and the allocation of resources in free markets. The division of labor would receive only a few passing mentions in the rest of the *Wealth of Nations*.[10]

Adam Smith sought the superiority of markets in their allocative function. Motivated only by self-interest, and guided by market prices, buyers and sellers vary the amounts they buy and sell until each market converges upon its "central price to which the prices of all commodities are continually gravitating."[11] The concept of a central or "natural price" was rooted in CRS.[12] John Hicks (1989: 10) writes that in spite of what Adam Smith has to say about scale economies in his theory of growth, "we still find that in his value theory, his cost of production value theory, he does not get away from CRS." In the presence of increasing returns to scale, output and price changes in one market would be transmitted to other markets through forward and backward linkages making the concept of an equilibrium and a natural price irrelevant. The die was cast: the 'invisible hand' would have to lean on the crutch of CRS.

Adam Smith offered at least three arguments in favor of free trade. It augmented markets, thus giving impetus to growth *via* division of labor; it allowed capital to flow into the most productive channels based on a country's absolute advantage; and it gave vent to the country's surplus. The first argument was problematic; since it reinforced existing advantages in manufactures and commerce it would disadvantage countries that entered free trade with a handicap in these sectors. The second argument would work only if capital *or* labor was completely free to cross borders.[13] The third argument offered free trade as a remedy for the surpluses created by shifts in trade away from a country' exports; but greater exposure to trade might also worsen the problem of surpluses. In other words, the *Wealth of Nations*, failed to make a strong case for free trade. This deficiency had to be remedied.

It is believed that David Ricardo (1817: 93-95) brilliantly rose to the occasion with his theory of comparative advantage. His success however came at a high price: he examines trade within a purely static framework. For four centuries, the mercantilists had framed their arguments for protectionism within a dynamic framework: they argued that a lagging country was unlikely to improve its chances of growth or preserve its sovereignty under free trade. Ricardo framed his question within a purely static framework: he fixed technology, tastes and labor in each country. He makes another critical assumption: production is subject to CRS. Within this static framework, free trade is always the best policy whether a country's comparative advantage lies in potato chips or computer chips.

This shift towards static analysis was an ideological necessity. Britain had outgrown the mercantilist policies that had elevated it from the ranks of a backward country in the early fifteenth century to become the world's leading economy by the mid-eighteenth century. In an

[9] In the middle of chapter four of the *Wealth of Nations*, writes Nicholas Kaldor (1972/1989, 378), Adam Smith "suddenly gets fascinated by the distinction between money price, real price and exchange value, and from then on, hey presto, his interest gets bogged down in the question of how values and prices are determined for products and factors of production."
[10] Smith (1776/1975): 64, 84,243-44,415-416, 659, and 707. In only two places (415-16 and 706), Adam Smith briefly touches upon the connection between size of markets and division of labor.
[11] Smith (1776/1975): 58.
[12] For his discussion of the relationship between market price and the natural price, see Smith (1776/1975): Book I, chapter 7.
[13] Alam (2000: 50-52) deals with the first contradiction.

essay on the rich country-poor country debate among Scottish thinkers in the eighteenth-century, J. M. Low (1952, 324) writes that this was "the central point of the *Wealth of Nations*." "Smith and [Josiah] Tucker," he continues, "were agreed that Britain was already a rich country and hence that there really was no need for the government to intervene to safeguard advantages which we were in no danger of losing." Unlike Adam Smith, however, Josiah Tucker had the candor to concede that what was good policy for Britain was not good for poor countries. Protectionism would be the right policy for the lagging countries, since only this could raise productivity in their manufacturing activities.

2. Neoclassical economists

Once the classical economists had chosen to demonstrate the superiority of free markets within the static framework of allocative efficiency, the path was clear for the marginalist revolution of the 1870s with its focus on methodological individualism and marginalist analysis.[14]

In order to demonstrate the efficiency of markets in equilibrium, economic theory would have to show that the decisions of self-interested buyers and sellers led to equilibrium in all markets that also produced a Pareto-efficient allocation of resources.[15] Leon Walras formally launched this quest in his *Elements of Pure Economics*, published in two parts in 1874 and 1877. Crucially, his general equilibrium analysis assumed CRS in production: in addition, capital, labor and land always entered his production function with fixed coefficients. Employing more rigorous mathematics, Kenneth Arrow and Gérard Debreu (1954) and Gérard Debreu (1959) demonstrated the existence of a unique solution to their system of equations; they also established the two fundamental theorems of welfare economics. Their general equilibrium system too was built on the assumption of non-increasing returns to scale.

The neoclassical production function with smooth factor substitution and CRS underpins at least two additional ventures in neoclassical economics. Although the concept of marginal product of labor had been around since the early nineteenth century, the marginal productivity theory of factor prices was developed only in the late nineteenth century. While earlier writers had spoken of the law of diminishing returns in agriculture, in 1888 John Bates Clark developed a nearly full-blown theory of factor prices rooted in the law of diminishing returns. He claimed that this law applies to the marginal return to *any* homogenous factor when it is combined with fixed quantities of other factors, provided the technology of production remains fixed. For this theory to work, however, payments to factors would have to fully exhaust the total product. In 1894, Philip Wicksteed (1931) pointed out that product exhaustion could occur only in the presence of CRS. Some five decades later, George Stigler (1941: 49) added another

[14] The Austrian economists did not think in terms of equilibrium. In neoclassical economics, individuals have perfect information and tastes and technology are given; discovering equilibrium in this system is a problem in constrained optimization since consumers maximize utility and producers maximize profits. Individuals in the Austrian system possess only local information about matters that concern them; and only individuals possess information about their tastes and the resources and technology that are available to them. As a result, individuals alone have the best chance of making the right decisions in the face of changing tastes, technology and prices. Moreover, this is a constantly evolving system since the information on which individuals base their decisions are constantly changing. In other words, economic life consists in the discovery of new and better information in a world of changing information.

[15] Other factors too may have propelled the timing of this shift or the mathematization that accompanied it. In part, at least, it would appear that the marginalist revolution was advanced to counteract the revolutionary twist Karl Marx gave to the labor theory of value. Philip Mirowski (1990: chapter 7) has written about the physics envy that pushed some economists in the late nineteenth century to adopt marginalist analysis and mathematical formulae.

twist: the law of diminishing returns itself may not hold in the presence of increasing returns to scale. In other words, without CRS the neoclassical theory of production would have to abandoned.

3. Can the neoclassical economy exist?

The competitive paradigm is the capstone in the edifice of mainstream economics. Every graduate student learns, whether he comprehends it or not, that the system of equations that defines this paradigm possesses a unique equilibrium solution that is also stable and Pareto-efficient. However, soon after this paradigm was completed in the 1950s, a variety of critics began to point out that this system cannot stand up to changes in any of its numerous assumptions.

Building on the work of Allyn Young (1928), Nicholas Kaldor (1972) demonstrated the irrelevance of this paradigm in the presence of increasing returns to scale. John Hicks (1989: 16) offered a more friendly critique. He concluded that "if used with proper precaution in the approximate contexts, [CRS] can be a help: but if misused, or if it is applied in the wrong context, it can indeed, as Kaldor thought, be a hindrance." Stiglitz (2001) and his associates have shown that banks cannot and do not rely on market clearing to allocate their funds: instead, they ration their loans. A whole school of behavioral economics has been taking aim at the claims of rationality made by the competitive paradigm.[16]

This note presents a different critique. It shows that the competitive paradigm breaks down in the presence of CRS. First, it shows that under CRS, production of goods for self-consumption will partially or completely displace production for markets. Further, if we assume with David Ricardo that labor is the only factor of production, a natural economy will necessarily and fully replace the competitive market economy. This can be established intuitively.

The presence of CRS in the competitive paradigm means that unit costs of producing goods are fixed regardless of the scale of production. In turn, this means that no advantage can accrue to individual economic agents – all of whom have access to the same technology – from specializing in the production of any good.[17] As a result, each person can supply himself with the goods that he needs as cheaply as anyone else however small the quantities of goods that he needs for his own consumption. All this establishes a presumption that a market economy may emerge in the presence of CRS only when a person's endowment of factors prevents him from producing his preferred consumption bundle.

First, consider the competitive economy as it is. In this economy, x_{1i}^* and x_{2i}^* denote individual *i*'s optimal consumption bundles in a competitive economy that produces two goods, x_1 and x_2. In the competitive paradigm the individual *i* attains his optimal consumption bundle by selling all his factor endowments on the market and using the proceeds to buy his optimal consumption bundle. However, this is not the only way that an individual can attain his optimal consumption bundle. Under constant unit costs an individual may choose to avoid the market and instead self-produce his consumption bundle. This would be quite straightforward if his endowment of factors turned out to be identical to the bundle of factor services required to produce x_{1i}^* and x_{2i}^*. If the factor endowments of all individuals coincide with the factor

[16] See Heukelom (2012).
[17] In the Ricardian model, countries will specialize (and gain from trade) because technology or production is not the same across countries.

requirements for their consumption bundles, production for the market becomes unnecessary. Individuals in this economy would be indifferent between self-producing their consumption bundles or buying them on the market. It might still be possible to preserve the market economy if we assumed that *all* individuals prefer market-acquired consumption bundles over self-produced ones. On the other hand, the existence of a market economy would be ruled out if we introduce transaction costs into the model.

It is much more likely, however, that an individual may not possess exactly the factor endowments that are required to produce his optimal consumption bundle. He may overcome this mismatch between the two bundles *via* different equivalent exchanges: trading goods, trading factors, or some combination of the two. In the absence of transaction costs - another assumption of the neoclassical model – individuals will be indifferent among the three types of trades. An individual could use his factor endowment to produce goods and meet the deficit between this production bundle and his optimal consumption bundle *via* trading on the markets for goods. Alternatively, he may use *some* part of his factor endowments for self-production and trade both goods and factors to attain his desired consumption bundle. As a result, an infinite number of options exist for each individual to attain his consumption objective. If all individuals chose to trade *all* of their factors this and this alone would reproduce the competitive equilibrium of neoclassical economics. But this is a limiting case: one equilibrium amongst an infinite number of possible equilibria. In all other scenarios, with at least *some* individuals engaging in *some* amount of self-production, the economy would combine markets and self-production to satisfy the demands of consumers.

If labor is the only factor of production, CRS will rule out all market exchanges. Since labor is the only factor of production, each individual can produce *any* bundle of goods so long as this satisfies his labor constraint. If x_1 and x_2 are two goods in this economy, and a_{L1} and a_{L2} are the corresponding labor coefficients, the individual's production function is given by

(1) $x_1.a_{L1} + x_{2.}\, a_{L2} = L,$

where L is his endowment of labor. Equation (1) also represents the individual's budget constraint. In other words, every individual can self-produce *any* point he chooses on his budget constraint because the budget constraint is also his production function. Since production and consumption bundles in this economy are identical for *all* individuals, there is no need for trade. Trade would arise only if production technology – the labor coefficients for different goods – varied across individuals. Since the competitive paradigm rules this out, the neoclassical market economy cannot exist.

4. Some concluding observations

How did neoclassical economists miss this inconsistency in their core model? Perhaps the answer is to be found in the ideological function of mainstream economics: many of its most avid practitioners have used it to demonstrate the superiority of free market capitalism.

It was Adam Smith who started economics on this course. Aware that a dynamic analysis of markets could just as easily support dirigisme, he shifted gear and chose to make the case for free markets within a static framework with constant unit costs. Following his lead, David Ricardo formally established the superiority of free trade with constant costs. However, no formal proof yet existed of the superiority of free markets. Three developments in the late

nineteenth century would advance economists towards this goal: the marginalist revolution, the acceptance of Vilfredo Pareto's definition of efficiency, and the use of mathematical tools borrowed from physics and engineering. Even so it took a while to work out the exact specifications of a decentralized economy that could play host to the invisible hand. Kenneth Arrow and Gerard Debreu finally reached this Valhalla in the 1950s: or so they thought.[18] The intellectual gymnastics this required quite staggers the sober mind not mesmerized by the mathematical beauty of general equilibrium economics. The assumption of CRS was just one of several tricks in the acrobatics of neoclassical trapeze artists.

Could economists have developed a defense of free markets on less restrictive assumptions? The Austrian economists claim that they have done so. Nevertheless, the Austrians take a distant second place to neoclassical economics in the mainstream discourse on free markets. Why is this the case? The neoclassical emphasis on market equilibria and Pareto-efficiency has an important ideological advantage over the Austrian analysis of markets with its emphasis on informational efficiency. The first lent itself to mathematization, the second did not.[19] In the competition for dominance, therefore, neoclassical economists could claim the prestige of mathematics; this was a handicap for the Austrians. In addition, the mathematization of neoclassical economics aided in the professionalization of economics. On the one hand, it outfitted economists with the "tools" and "models" that gave them the prestige of physics and engineering. Mathematization also proved to be a powerful engine of job-creation: especially since reality could impose no check on the proliferation of economic models. The fate of economics was sealed.

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[18] Some critics of neoclassical economics cast doubt on this claim: see Frank Ackerman and Alejandro Nadal (2004).
[19] Paul Samuelson may have clinched this trend with his *Foundations of Economic Analysis* published in 1947.

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Reassessing the basis of corporate business performance:
modern financial economics' profit control versus integrated people and process improvement

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In his essay "*Technik* comes to America: Changing Meanings of Technology before 1930," Eric Schatzberg points out how the American concept of technology came to incorporate ideas about *Technik* formulated in Imperial Germany (1871-1918). (Schatzberg, 2006) Although he wrote the piece for the Society for the History of Technology, it should just as easily have been directed at economists. In Germany the idea of *Technik* [the combination of *Können* (practical skills and industrial arts) and *Wissen* (knowledge)] was the essence of engineering, but the Germans – who proselytized the idea – were often historical economists (e.g., Gustav Schmoller and Werner Sombart). (Drechsler, 2011) Moreover, the Americans involved in the transfer of the concept of *Technik* to America were institutional economists, *primus* among whom stood Thorstein Veblen.

Yet it is perfectly understandable that Schatzberg in 2006 would not address American economists, because the institutional economists carrying out the transfer of *Technik* before 1930 subsequently had been thrown out of economics – to be replaced by econometricians and neoclassical economists. Not only that, but, like the Stalinists who erased Trotsky from Bolshevik history, the neoclassical economists and econometricians after their takeover of American university departments of economics and business schools, refused to teach the history of economics or the history of economy theory, thereby preventing their students from even learning about institutional economists. George J Stigler noted the consequences in an article published in 1965:

> "Whereas in 1892-93, forty percent of the references cited in American economics journals were in foreign languages and half of these in German, total foreign language citations have fallen to less than four percent in recent times and German has almost vanished as a foreign language from American economics." (Stigler, 1965, 47)

Stigler went on: "If references to Schmoller are now rare, references to differentials and matrices have made some sort of compensation." The transformation of the content of economics explains the dramatic decline in German influence; econometricians found little inspiration in the publications of the historical school. People in Schatzberg's example have had, therefore, to turn to the history of technology to learn about the history of economics.

The story of the successful fight of neoclassical economics and econometrics for mastery is well known (e.g., Stigler, 1965, Locke, 1989, Khurana 2007); It is of specific interest here because the analytical tools they have fashioned or adapted determine the behavior of managers in industrial firms. The most obvious evidence of dominance comes in the late 20th century with developments in investor capitalism. Lawrence Mitchell notes in *The Speculation Economy* (2007):

> "A recent survey of more than four hundred chief financial officers of major American corporations revealed that almost eighty percent of them would

> have at least moderately mutilated their businesses in order to meet analysts' quarterly profit estimates. Cutting the budgets for research and development, advertising and maintenance and delaying hiring and new projects are some of the long-term harms they would readily inflict on their corporations. Why? Because in modern American corporate capitalism the failure to meet quarterly numbers almost always guarantees a punishing hit to the corporation's stock price. The stock price drop might cut executive compensation based on stock options, attract lawsuits, bring out angry institutional investors waving anti-management shareholder proposals and threaten executive job security if it happened often enough. Indeed, the 2006 turnover rate of 118 percent on the New York Stock Exchange alone justifies their fears." (Mitchell, 2007,1)

The tools that the triumphant neoclassical financial economists developed to serve investor capitalism in this relationship with the firm, Mitchell also describes. He stresses one, the Capital Asset Pricing Model (CAPM) that the Nobel Prize winner Harry Markowitz introduced. Mitchell remarked:

> "[T]he product of a regression analysis called *beta*, CAPM allows investors to build the kinds of potentially lower-risk, higher-return portfolios ...described by Markowitz, based solely upon a narrow range of information about the stock. The business itself matters little, if at all. All an investor needs is *beta*. No balance sheet, no profit and loss statement, no cash flow information, no management analysis of its performance and plans, no sense of corporate direction, no knowledge of what is on its research and development pipeline, no need even to know what products the corporation makes or what services it provides. Just *beta*. The stock is virtually independent of the corporation that issued it. CAPM has been adopted and is daily used by countless stock analysts and institutional money managers. Almost every American who invests in the market through mutual funds or other institutional media has invested on the basis of CAPM." (Mitchell, 2007, 275)

Almost every firm's management is, as a result, and especially since the rise of Institutional investors, detrimentally affected by the performance pressures of investor capitalism and the managerial tools that finance economists have developed to serve its interests, not the interests of industrial enterprise, or, considering the financial crisis they helped instigate, the interests of the public.

Perhaps more importantly, the deleterious effect of the toolkit of neoclassical economists, econometricians, and finance capitalists has also been expressed inside the firm, in the management hierarchies that Alfred D. Chandler, Jr. so famously and meticulously described in his work (e.g.,The *Visible Hand*, 1977). Chandler stressed that different levels of management in huge 20th century multi-divisional corporations had different aims. Headquarters focused on money – as Alfred P. Sloan, Jr. at General Motors succinctly put it, "We are not in the business of making cars, we are in the business of making money." (Quoted in Rother, 2010, 63) Headquarters were staffed with controllers, accountants, and finance analysts. Engineers were increasingly relegated to the managerial echelons where they would be ostensibly preoccupied with the production of artifacts and the provision of services. But the money men's concerns became paramount throughout a firm's management hierarchy as the management systems headquarters devised provided for top-down control

and bottom-up financial reporting, with analysis based heavily on "reported managerial accounting data." (Rother, 63) Thus management even in manufacturing firms was monetized. Two critical discussions about how this affected performance are presented.

1. Discussion one: management by results and management by means

A major figure among those who have questioned the management tools that economists in universities and US business have foisted on U.S. industrial firms is H. Thomas Johnson, Professor of Sustainable Management at the Portland State University Business School. Swimming against the tide, Johnson recently developed a course (Management 410) at Portland State that "offers students a radically different view of recent American business history than the view that has informed virtually all business school teaching in the past two generations (Johnson, 2013 "The Rise of Managerialism and the Decline of Responsible Management in American Business Since 1945." Course syllabus reproduced in Annex).

Johnson began his publishing career working with Alfred D. Chandler, Jr. on the accounting systems that accompanied the creation of the *Visible Hand* of management that Chandler described in his Pulitzer Prize winning book (1977). (Johnson, 1978) But in the 1980s, working with Robert Kaplan, he came to question this accomplishment in an award-winning book co-authored with Kaplan, *Relevance Lost*. (See Syllabus for Management 410 in the Annex for access to the essay describing how his transformation occurred: Johnson, 2002). During this journey of apostasy Johnson parted company with Kaplan, too (see in syllabus, Art Keiner (2002) where the Johnson/Kaplan feud is reviewed).

After studying the Toyota Production System, Johnson concluded that Management Accounting's Control Systems that he had formerly praised, what he calls Management by Results, were responsible for the decline of U.S. manufacturing, especially automobiles. He recommended instituting Management by Means (the cultivation of inter-personal relationships on the shop floor). (See Johnson and Bröms (2000) and Rother, 2010). One could, Johnson claims, if work processes are properly organized, dispense with these U.S. management control mechanisms and get far better results.

There is no need to expand the discussion about the Johnson critique; much of the referenced literature is easily retrievable in the course syllabus (Annex) and other relevant works cited are readily available. They suffice to clarify why Johnson and a small number of his colleagues believe the tools of management that neoclassical economics and econometrics taught and fostered in business schools promoted bad management and how the Toyota alternative differed.

2. Discussion two: German *Technik* as an alternative to the economics-induced US system of managerialism in industrial firms

In 2003 Edward Fullbrook wrote about the influence of the triumphant neoclassical and econometric brand of economics in America:

> "They control the three most prestigious economics journals in which papers by their staff and PhDs predominate. Of the over 800 economists employed by the World Bank, a majority have been trained at one of the Big Eight

> (California-Berkeley, Harvard, Stanford, Yale, Chicago, Columbia, Princeton, and MIT). The International Monetary Fund is similarly provided, as are the other highly ranked economics departments in the US and in some cases in other countries. The 2003 edition of Penguin's *Dictionary of Economics*… has entries for 29 living economists. Of these, 26… are from the US or have had all of the most important part of their careers there. Of the 26, 100 percent have either taught at or received their PhD from one of the Big Eight." (Fullbrook 2003, 6, Also Khurana, 2007)

If the German historical school of economics still has a voice in German academia because it is their tradition, in economics it has become a weak one, as the dominant and domineering US neoclassical school and the econometricians swept the academic board worldwide. In German academia American neoclassical economics and econometrics, too, are now quite at home.

This success is evident in praxis as well, especially in investment banking. Within the new banking environment that appeared in the late twentieth century, German banks began, following UK and American banks, to market new products and services. (Bátiz-Laso, Müller, and Locke, 2008) These included different loan packages, credit cards, insurance, and electronic banking through automated teller machines (ATM) and on-line services. The biggest shift in their banking practice, however, came when the commercial banks, above all Deutsche Bank and Dresdner Bank, in order to establish a reputation as security traders and business consultants in the new international environment, increasingly disengaged themselves from traditional *Hausbank* functions in German industry. Fewer bank executives by the turn of the 21st century sat on the supervisory boards of large German concerns. Whereas, for instance, in 1974 senior executives from German commercial banks occupied over 20 percent of the supervisory board seats in the 100 largest German companies, in 1993 this percentage dropped to a mere 6.3 percent (Lutz, 2000). Banks acted less as *Hausbanken* for large companies and held less of their clients' stock in their portfolios. Clients in the old "kingly merchant" German banking tradition simply became "customers" American style.

In order to overcome a lack of investment banking experience even in their home markets, German commercial banks sought to import UK and American expertise. German commercial banks joined a move by other European banks (like that made earlier in the UK by Barclays Bank and Midland Bank) and developed investment banking activities by acquisition rather than internally. Deutsche Bank, for one, turned to the UK and the US to recruit staff well versed in the ways of capital markets, and it bought Morgan Grenfell, the British merchant bank, in 1989 and Bankers Trust, the US specialist in hedge funds, in 1999. Dresdner Bank acquired UK-based Kleinwort Benson in 1995 and US-based Wasserstein Parella in 2000, attempting to expand into the global big league of underwriting, sales and trading, and merger advice.

Still, in 2004 the investment arms of the two major German commercial banks (Deutsche Bank and Dresdner Bank) combined had, within Germany itself, only 38.3 percent of the mergers and acquisitions, 21.8 percent of the equity market, and 16.3 percent of the debt market business (*The Economist*, 13 November 2004, 82). J.P. Morgan, Morgan Stanley and Goldman Sachs beat the German banks in their home because this investment banking was an American kind of capitalism. The position of German banks was so bad that a German agency, *Kreditanstalt für Wiederaufbau*, thought it best in order to optimize results in the privatization of Deutsche Telekom, the German telephone company, to auction large

blocks of shares through foreign investment banks rather than through the investment bank arms of Deutsche Bank, Dresdner Bank and other German banks (*The Economist*, 27 March 2004, 75).

German investment banking's absorption into the UK-US banking world, symbolized by the relocation of Deutsche Bank's investment banking headquarters to London, amounted to its general acceptance of the investment banking toolkit that US business schools worked out co-operatively with prominent Wall Street investment firms (Locke & Spender, 2011, 156-73). To the extent that these practices provoked the financial crisis, German banking through its adoption of them became system accomplices.

German industrial management, however, could not so easily fall under the sway of financial control economics. Although from a management accounting perspective German engineers and business economists were steeped as much as Americans in accounting techniques – they had often been pioneers in their creation (Locke, 1984, 2006, 155-97) – there was more to industrial management than accounting. Johnson remarked:

> "Successful [US] managers believed they could make decisions without knowing the company's products, technologies, or customers. They had only to understand the intricacies of financial reporting.… [B]y the 1970s managers came primarily from the ranks of accountants and controllers, rather than from the ranks of engineers, designers, and marketers. [This new managerial class] moved frequently among companies without regard to the industry or markets they served.… A synergistic relationship developed between the management accounting taught in MBA programs and the practices emanating from corporate controllers' offices, imparting to management accounting a life of its own and shaping the way managers ran businesses." (Johnson and Bröms, 2000, 57)

Johnson despised these lifeless pyramidal structures imposed on work processes and managed by computer-oriented-production-control experts:

> "At first the abstract information compiled and transmitted by these computer systems merely supplemented the perspectives of managers who were already familiar with concrete details of the operations they managed, no matter how complicated and confused those operations became. Such individuals, prevalent in top management ranks before 1970 had a clear sense of the difference between 'the map' created by abstract computer calculations and 'the territory' that people inhabited in the workplace. Increasingly after 1970, however, managers lacking in shop floor experience or in engineering training, often trained in graduate business schools, came to dominate American and European manufacturing establishments. In their hands the 'map was the territory'. In other words, they considered reality to be the abstract quantitative models, the management accounting reports, and the computer scheduling algorithms." (23) (For further comment on how abstract quantitative models misrepresent reality see, Drechsler, 2011 and Syll, 2012)

Nonetheless, in his critique of US Management by Results, Johnson's concern is as much with the people from business schools who increasingly lacked the skills and experience

acquired on the shop floor, as with the instruments of management accounting. People familiar with similar tools, in a different educational and work environment (e.g., the French ingénieur-économistes) produced much better results or at least much less harmful ones than did financial economists in US business schools (Locke, 2011b). This German manufacturing management culture did and does, too.

Engineering equals Technik

Germany has strong traditions in craft workmanship that have been integrated into the educational and industrial system. German secondary school students can and do enter into an apprenticeship, after grade 10, and work in an organized program in a firm on some approved occupation (chimney sweeping, bookkeeping, metal working, machine operating, etc), while still attending high school courses (e.g. in English, German, mathematics), before they end the program, after three years, if successful, with an apprentice certificate in their specialty (*Fach*). This practical education can be continued up to the master craftman's level (*Meisterbrief*), a qualification that is highly respected in the German work world. Many first line supervisors in German factories have this qualification.

The apprenticeship system tied into a system of commercial and technical education that required people to have completed an apprenticeship in order to enter the schools. Students in these schools (now *Fachhochschulen*) studied for three years, alternating coursework with stints working in industry – to emerge with a sub-university diploma, of *Grad-Ing* (later *Dipl-Ing FH*). In 1900 an Imperial decree permitted the technical institutes (Hochschulen), whose scientific stature had grown impressively as had the institutes during the second half of the 19th century, to issue the university level degrees of *Dipl-Ing* and *Dr. Ing*, the first university-level engineering doctorate in the world. Before World War I revealed the ugly side of technological civilization, the new high tech industries that the technical institutes did so much to foster, spectacularly, especially in the electrification of the world, like the digital revolution today, captured the admiration of the public. Nonetheless, scientific achievement did not separate the engineering professors from the practical work world. The professors were required to have at least five years' experience in industry to be eligible for a technical *Hochschule* chair.

German technical education, which grew up about 1900, thrived, if in different forms, throughout the 20th century, as a unified system connected to industry. Professors in the technical institutes (*Hochschulen*) educated the teachers who worked in subuniversity technical schools (today's *Fachhochschulen*). Accordingly the teachers in the subuniversity sector carry a scientific knowledge component from the technical *Hochschulen* where they have been taught to the technical schools where they teach. Because the technical schools stressed practical education, the technical *Hochschule* educated teachers were also required to have years of experience working in firms before landing a teaching position. As for technical school students, because their teachers had studied in technical institutes, students were exposed, through them, to the knowledge component (*Wissen*) of engineering, but because students in technical schools were required to have done an apprenticeship to enter, they had exposure to the practical (*Können*) part of engineering (*Technik*). Graduates of technical schools (*Grad-Ing*, today *Dipl.-Ing FH*) have consistently been highly sought after by German industrial firms; they rise to the highest positions in German industrial management.

The interconnection between this system of technical education and praxis made German engineering a different animal than that growing up in the United Kingdom. Ian Glover notes that "In Anglophone countries, two cultures, the arts and sciences are recognized." In the two cultures engineering was placed in an inferior place within the science culture, and UK scientists looked down on engineering as an inferior subject for the less brilliant and gifted. Glover went on to note that in [Germany] rather than two cultures there are three: "*Kunst* (like the arts), *Wissenschaft* (similar to science) and *Technik* (the many engineering and other making and doing subjects, representing practical knowledge (*Können*)," including scientific knowledge (*Wissen*). (Glover, 2013, 9) In Germany a great chain of practical education *(Können*), the art of practical work, topped off with knowledge (*Wissen*) gained primarily in technical *Hochschulen*, combined, in education and workplace, to define German engineering as this third culture of *Technik*. The German engineering society [Verein Deutscher Ingenieure (*VDI)*] has consistently pitched a large tent, including in its membership craftsmen, machinists, *Grad-Ing, Dipl-Ing,* and *Dr-Ing*. If distinguishable from each other in the social hierarchy, they stood and stand as equal participants through their skills and knowledge, all carrying out the tasks of German engineering, provided, of course, that they know their job (i.e. have *Fachkompetenz*) and are able to perform in the firm by being both *leistungsfähig* and *leistungsfertig* (*fähig* = capable of doing a specialist job, educated for it, *fertig* = ready to do the specific job assigned).

Transferred to the industrial enterprise, German *Technik* produces a very different kind of management than that encountered by Johnson after 1970 in US industry. Four differences can be emphasized.

1. Whereas US top managers and their minions from business schools say that the firm's purpose is to make money, in Germany firm managers steeped in *Technik* say that profit making is incidental to the greater purpose of the firm, which is to provide a superior product and/or service to benefit humankind (Lawrence, 1980, 108). This is the ethos of engineering that economists rarely share.
2. If in Germany the product or service is the thing, then for the firm's employees knowledge of a job speciality (*Fachkentnisse*) and performance (*Leistung*) are keys to success.
3. The German manager's education is that of a specialist, and so is his or her managerial function in the firm. MBA education has never flourished in Germany; nor have business schools; nor in academia has generalist management education. German industrial management, under the aegis of *Technik*, does not need to discuss what MBAs learn in their generalist education about company strategy, neither does it need to set up special groups outside the production process – as business school educated US management does -- to plan, control, and make decisions. The goal is to make the best possible product or service. *Technik* is in the foreground, and management techniques and company strategy take second place.
4. This respect for specialized experts within the production process to conduct management, leads to a diversity which is often represented on a company's board of directors. Lawrence, in his study of German managers and management, comments: "Not only is the production engineer there but so is an engineer from Design, often, in fact, more than one is on a board if the firm has more than one product line." Germans do not want people on the board who don't know their stuff. But diversity does not produce disunity in overall purpose. Within the German firm, *Technik* is a force for integration. The German firm is *Technik* in organizational form. The skilled worker, the foreman, the superintendent, the technical director are all participants in

> *Technik*. While there are many things that they do not have in common, *Technik* is something which transcends hierarchy. (Lawrence, 1980, 98)

In Anglophone countries, neoclassical economics and econometrics have assumed the status of "superior" "sciences", which in their two-culture environment permits them to guide and control the lesser (inferior) technical skills and knowledge components involved in production processes. As an outsider within the German three culture world, economics as "science" cannot interfere with the third culture of *Technik* with such impunity.

Just as Johnson attributes superior outcomes at Toyota's Georgetown, Kentucky plant, to Management by Means, which Management by Result in Detroit's Big Three could not match, the German engineering community united by allegiance to *Technik,* in which cohorts of business school MBAs had no place, outperformed the MBA graduates and finance experts in US industrial management who used the toolkit of neoclassical economics and econometrics but lacked the knowhow that the German management engineers possess about how to run industrial processes. The US automobile industry declined under such a regime in the late 20th century, while leading German firms reformed their production systems in the 1990s and joined the Japanese as world leaders in this highly competitive industry. At the same time, German firms, many of them family owned niche manufacturers in what Germans call the *Mittelstand* (small and medium size firms) also thrive because their owners pay close attention to the recruitment and training of a workforce driven by the values of *Technik* not those of the moneymen. (Vernohn and Meyer, 2007, 29)

These two discussions plus references to the constraints of Investor Capitalism illustrate the shortcomings of neoclassical economics and econometrics as prescriptive economic and management science, which they claimed or at least aspired to be as they emerged in academia, government, and firms after World War II. Despite the evidence of their failure, about which readers of the *Real World Economics Review* and its blog are depressingly aware, mainline economists cling to their methods and claims. They do so because they believe that from their methods a prescriptive science **might** someday, somehow, appear (a hope), and that, even in a worse-case scenario, if scientific competence continues to elude them, the methods of precursors, in historical and institutional economics, have even less of value to offer.

Is this true? Discussions of German *Technik* suggests that it might not be. The pre-1930 institutionalists looked at economics differently from those that replaced them. Schatzberg observed that the institutionalist Edwin R. A. Seligman, defined economics as the study "of the social conditions necessary for the sustenance of life." (498) The neoclassical economists and econometricians have paid scant attention to the social conditions supporting the sustenance of life. Yet Johnson's analysis and the German concept of *Technik* are very much preoccupied with the social conditions of life expressed in the production process (i.e., interpersonal relations, the producing community uniting around the idea of *Technik*).

Thorstein Veblen in an appraisal of German *Technik* noted that it produced a set of socially beneficial tendencies and a set of parasitical forces. Among the beneficial tendencies he counted "workmanship, industry, the machine process, and technological progress." (Schatzberg, 499) On the parasitic side he listed "predation, business enterprise, absentee ownership, and other pecuniary institutions." (499)

From the perspective of econometric and neoclassical economics, Veblen's dialectical reasoning, however sophisticated the historical analysis, is not very useful for their prescriptive problem-solving. But this is so only if we restrict that decision-making to the power brokers in society that neoclassical economists and econometricians have educated. If the decision involves social choices that would promote or hinder the peaceful development of industry for the entire community, then Veblen's institutional analysis is more germane to proper decision-making about our macro and micro economic future than neoclassical economics or econometrics. Veblen singled out one parasitical institution, which is worth mentioning because it is the subject at hand – the business school.

In his 1918 book *The Higher Learning in America: A Memorandum on the Conduct of Universities by Business Men*, he provided a critical perspective on the role of the schools of commerce within the American university and, by consequence, their effect on the society as a whole. Veblen asserted that "the college of commerce (now called colleges of business), if it is to live and thrive, may be counted on to divert a much larger body of funds from legitimate university uses, and to create more of a bias hostile to scholarly and scientific work in the academic body, than the mere numerical showing of its staff would suggest." (Veblen, 1918, 157) Furthermore, he wrote about the consequences that a "habitual pursuit of business" has on the ideals, aims and methods of the scholars and schools devoted to "the higher learning". Put simply, "The consequences are plain. Business proficiency is put in the place of learning." (Veblen, 1918, 142 in Robert Kemp, 2011).

Our complaint about US business schools mirrors Veblen's. To use his colorful language, they are a "parasitical force" because they do not peacefully serve "the entire community". (Locke, 2012) Traditionally universities do because they are engaged in knowledge creation through science and the teaching of that knowledge in a disinterested way to students. That is Veblen's view. Business schools are a different matter since they promote "business efficiency" at the expense of knowledge. To the extent that they have taken over university education (and Robert Kemp's study indicates that this takeover is almost complete [Kemp, 2011]), the information they now disperse increasingly serves only a special interest not the "entire community." (Locke and Spender, 2011, 100-103) Since they ignore people in the community engaged in crafts and other practical economic pursuits, business schools by this selectivity and exclusivity, unlike schools in German technical and commercial education, do not relate to the "entire community." Nor do the curricula they develop, serve the general interest of the firm. Their professors and MBAs look on firms, as do their all-powerful CEOs, as money mills that funnel money to top managers, stockholders, and other investors, and they have fashioned the management control and reporting instruments, accordingly, even if, as the examples cited in this text show, that toolkit leads to underperformance and perhaps to the eventual extinction of the firm, primarily at the expense of non-management employees and workers.

In recent decades, as the gap between rich and poor becomes increasingly alarming and the trend apparently irreversible, i.e., it is not cyclical, claims about the fruitfulness of American enterprise – that it sustains a people of plenty – have become increasingly spurious. Neoclassical economists and econometricians have little to say about such matters, but institutionalists' do. Inasmuch as debates for understanding and reform require a close scrutiny of their economics, it is all the more important that students of economics in their business schools and departments of economics be exposed to economists like Veblen. For that to occur, students and professors of economics should not have to turn to people like Schatzberg in the Society for the Study of the History of Technology or Kemp, working in a

school of pharmacy, because there is good reason to think that the way we have institutionalized business education and enterprise management in the age of neoclassical economics and econometrics contributes mightily to the mal-distribution of wealth that threatens the existence of the commonwealth. **That** is what students of economics need to discuss, and they need a better economics to do it.

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Annex: The rise of managerialism and the decline of responsible management in American business since 1945

Management 410 (online) Winter 2013 **Syllabus**

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Course description and objectives

This course examines the influence of modern theories of economics and finance on management practice and business school teaching since the end of World War II. The course shows this influence through the rise of managerialism, a belief that managers using generic management theory and skills taught in graduate business schools can optimize performance in any business. As defined by business historian Robert Locke, the term managerialism also defines a "management caste" that seizes all decision-making power from an organization's owners and employees "on the grounds of [its] education and exclusive possession of the codified bodies of knowledge and know-how necessary to the efficient running of the organization." This elite caste of managers, increasingly disconnected from any

ethical considerations, has succeeded in the past sixty years in replacing responsible management practice and thinking with managerialism's"management from hell," thereby throwing America's economy, its business sector and its people desperately out of balance.
The objective of this course is to offer students a radically different view of recent American business history than the view that has informed virtually all business school teaching in the past two generations. It is hoped that exposure to this alternative view will equip students to better understand the root causes of today's deep and pervasive economic crisis and thereby help them to understand and evaluate measures that business, political and academic leaders propose as answers to this crisis.
This course is a work in progress and is subject to change on short notice.

Required reading
Robert R. Locke and J.-C. Spender, *Confronting Managerialism: How the Business Elite and Their Schools Threw Our Lives Out of Balance* (London and New York: Zed Books, 2011) [referred to below as Locke and Spender]
Articles assigned below [instructor will provide]

Recommended optional reading

- John Cassidy, *How Markets Fail: The Logic of Economic Calamities* (New York: Farrar, Straus & Giroux, 2009). A superb critique of modern economics and finance and the policy failures both have spawned.
- Herman Daly and John Cobb, *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future* (Boston: Beacon Press, 1989 and 1994). A timeless classic that should be required reading in all economics and management programs.
- Wendell Berry, *What Matters?: Economics for a Renewed Commonwealth* (Berkeley, CA: Counterpoint Press, 2010). A collection of 15 of Berry's most compelling and provocative essays from the past 25 years.

Useful weblink: http://www.worldeconomicsassociation.org;

Assignments
Discussion forum: Submit a succinct but meaningful answer to each week's question by the end of the week. Once you have submitted an answer you are able to examine and respond to other students' answers. The instructor will respond to each answer and to as many subsequent responses as possible. Use the forum as an opportunity to share ideas [responsibly and civilly] with other students.
Term paper: On or before [date] email to the instructor a paper of about 6 to 8 double-spaced pages summarizing findings from the course that challenge (or reinforce) your basic beliefs and values concerning the role of business in our society. In particular, discuss how the assigned readings and forum discussions provoked you to ask new questions, to see old assumptions in a new light. You are invited to reflect on personal experiences in business or in school
There is no final examination in this course.
Grades
Grades will be based on evidence from the forum discussion and other written work that you are pursuing conscientiously and seriously the issues raised in course and in the readings.

Weekly schedule of assignments (preliminary and tentative)
Week 1: Topic – Management and managerialism
Objectives

- Seek better questions, not better answers to poor questions
- View reality as relationships, not as a collection of separate parts

Readings

- Locke and Spender, Preface, pp. x-xix
- H. Thomas Johnson, "A former management accountant reflects on his journey through the world of cost management," *Accounting History*, NS Vol 7, No 1 (May 2002), pp. 11-21 [PDF]

Discussion question

- What fundamental purpose(s) do top managers serve in running a business?

Week 2: Topic – Managerialism and business school education to 1970

Objectives

- Examine the purpose of economic activity
- Consider management specialization and"lost concreteness"

Reading

- Locke and Spender, Introduction, pp. 1-21
- H. Thomas Johnson, "When Accountants Come to Power," review of Robert R. Locke, *Management From Hell: How Financial Investor Logic Hijacked Firm Governance* (2012) in http://www.nephis.org (May 8, 2012)

Discussion question

- How did abstract and quantitative management practices performed increasingly by mid- and top-level managers after the early 20th century, ostensibly to run larger and larger enterprises more efficiently, become "a system that has, most paradoxically, often denied organizations the very means needed to formulate and effectively reach their goals?" [Locke and Spender, pg. 19]

Week 3: Topic – Management science and the U.S. business school

Objective

- Examine conventional management thinking re: measurement, science and what matters

Readings

- Locke and Spender, chapter 1, pp. 22-60
- Art Kleiner, "What are the Measures that Matter?" *strategy + business Magazine* (First quarter, 2002), pp. 1-6. [PDF]

Discussion question

- In American manufacturing and information technology industries, what was the impact after 1960 of mathematical management tools developed during World War II and the new management thinking they helped bring to graduate business school education?

Week 4: Topic – Managerialism, business schools and a moral compass

Objective

- Consider moral imperatives, if any, that frame modern business behavior

Readings

- Locke and Spender, chapter 2, pp. 61-105
- Robert R. Locke, "Reform of Finance Education in U.S. Business Schools: An historian's view," *real-world economics review*, issue no. 58, 12 December 2011, pp. 95-112. http://www.paecon.net/PAEReview/issue58/Locke58.pdf.

Discussion question

- What ethical imperatives (moral compass) are consistent with/implicit in the "bottom-line" worldview that underlies American managerialist thinking? In discussing this, contrast management attitudes toward workers in American companies with those in foreign

companies (esp. in Germany and Japan) that value employee contributions to management.

Week 5: Topic – Managerialism and the U.S. auto industry

Objective

- Examine consequences of viewing business operations as a collection of independent parts versus a community of interdependent relationships

Readings

- Locke and Spender, chapter 3, pp. 106-132
- H. Thomas Johnson, "How Toyota Ran Off the Road – and How It Can Get Back on Track," *Leverage Points Blog* (http://blog.Pegasuscom.com/Leverage-Points-Blog/bid/30450/How-Toyota-Ran-Off-the-Road-and-How-It-Can-Get-Back-on-Track)

Discussion question

- How and where does control of operations in Toyota's production system differ from that in one of Toyota's typical American competitors?

Week 6: Topic – Bumper case: Two approaches to organizing work

Objective

- Observe and evaluate specific examples of work organized as a mechanism and as a natural living system

Readings

- H. Thomas Johnson, "Lean Accounting: To Become Lean, Shed Accounting," *Cost Management* (Jan/Feb, 2006), pp. 6-17

Video and Video Data Files

- Styro, Inc. (1984), simulation of large-batch versus lot-size-of-one assembly [http://www.psuemba.info/sba/tom/W2L1.wmv]
- Styro video data file (I recommend that you print out the data file to have in hand when you watch the video)
- Powerpoint file - Bumper case presentation

Discussion question

- What difference is there between the goal (or purpose) of operations in Toyota and a non-Toyota American competitor?

Week 7: Topic – Managerialism, business schools and our current financial crisis

Objective

- Examine the economic and social consequences of viewing business activity through the lens of finance

Readings

- Locke and Spender, chapter 4, pp. 133-173
- John B. Cobb, Jr., "Landing the Plane in the World of Finance," *Process Studies*, Vol. 38, no. 1 (2009) [PDF]

Video

- *Inside Job*, a story of the global economic crisis of 2008 directed by Charles Ferguson (Winner of the 2010 Academy Award for Best Documentary) [109 min.]

Discussion question

- Reflecting on the distinction John Cobb makes between "virtual" and "real" economic activity, do you expect business institutions to be a source of economic livelihoods and a venue for management (i.e., the task of "getting things done through people in organizations") in coming years?

Week 8 : Topic – Restoring balance

Objective

- Steps to reform; evaluate the idea of management as a "science"

Readings

- Locke and Spender, conclusion, pp. 174-192
- Andrea Gabor, "Seeing Your Company As a System,"*strategy+business* (Summer 2010) [PDF]

Discussion question

- Why do businesses need CEO's? In this regard, consider what the readings have said about employee-participative management, managing for long-term survival rather than for short-run financial targets, and managing "like a tree"(i.e., where every part embodies the spirit of the whole and the whole is an implicit pattern, not an external object separate from its parts).

Week 9: Topic – Searching for a moral anchor

Objective

- Examine the one and only universal human story

Readings

- Thomas Berry, "The Universe is Our University" [PDFl]
- Edward O. Wilson, "A New Enlightenment," *The Social Conquest of Earth* (W.W. Norton, 2012), chapter 27, pp. 287-297.

Video

- *The Awakening Universe: A Liberating New Cosmology For Our Time Based on "The Universe Story" by Thomas Berry and Brian Swimme*, a film by Neal Rogin [15 min plus interviews]

Discussion question

- What empirically-grounded narrative compiled by scientists in the past century offers a universal story of "how nature works"? Briefly discuss insights from that narrative that can guide our efforts to create a sustainable human economy.

Week 10: Topic – Moving management practice and thought to a new level

Objective

- Consider what business might be in a human economy that works in harmony with Nature's system

Readings

- H. Thomas Johnson, "A Global System Growing Itself To Death – And What We Can Do About It," *The Systems Thinker*, Vol. 23, No. 4 (May 2012), pp. 2-6 [PDF]
- H. Thomas Johnson, "Lean Management and True Sustainability," *Lean Manufacturing*(SME, July 2008), pp. 97-103.

Discussion question

- What key features might one observe in an economic system that embodies principles of "how nature works" rather than "how humans think" (cf. quotation from Gregory Bateson)?

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Capitalism and the destruction of life on Earth: Six theses on saving the humans

Richard Smith [Institute for Policy Research & Development, London]

Sleepwalking to extinction

When, on May 10th, scientists at Mauna Loa Observatory on the big island of Hawaii announced that global CO_2 emissions had crossed a threshold at 400 parts per million (ppm) for the first time in millions of years, a sense of dread spread around the world and not only among climate scientists. CO_2 emissions have been relentlessly climbing since Charles David Keeling first set up his tracking station near the summit of Mauna Loa Observatory in 1958 to monitor average daily global CO_2 levels. At that time, CO_2 concentrations registered 315ppm. CO_2 emissions and atmospheric concentrations have been relentlessly climbing ever since and, as the records show, temperatures rises will follow. For all the climate summits, the promises of "voluntary restraint," the carbon trading and carbon taxes, the growth of CO_2 emissions and atmospheric concentrations has not just been relentless, it has been *accelerating* in what scientists have dubbed the "Keeling Curve". In the early 1960s, CO_2ppm concentrations in the atmosphere grew by 0.7ppm per year. In recent decades, especially as China has industrialized, the growth rate has tripled to 2.1ppm per year. In just the first 17 weeks of 2013, CO_2 levels jumped by 2.74ppm compared to last year -- "the biggest increase since benchmark monitoring stations high on the Hawaiian volcano of Mauna Loa began taking measurements in 1958."[1] Carbon concentrations have not been this high since the Pliocene period, between 3m and 5m years ago, when global average temperatures were 3 or 4C hotter than today, the Arctic was ice-free, sea levels were about 40m higher, jungles covered northern Canada, while Florida was under water, along with coastal locations we now call New York city, London, Shanghai, Hong Kong, Sydney and many others. Crossing this threshold has fueled fears that we are fast approaching "tipping points" – melting of the subarctic tundra or thawing and releasing the vast quantities of methane in the Arctic sea bottom – that will accelerate global warming beyond any human capacity to stop it: "I wish it weren't true, but it looks like the world is going to blow through the 400-ppm level without losing a beat," said Scripps Institute geochemist Ralph Keeling whose father Charles Keeling set up the first monitoring stations in 1958: "At this pace, we'll hit 450 ppm within a few decades." "It feels like the inevitable march toward disaster," said Maureen E. Raymo, a scientist at the Lamont-Doherty Earth Observatory, a unit of Columbia University.[2]

Why are we marching to disaster, "sleepwalking to extinction" as the *Guardian*'s George Monbiot once put it? Why can't we slam on the brakes before we ride off the cliff to collapse? I'm going to argue here that the problem is rooted in the requirements of capitalist reproduction, that large corporations are destroying life on earth, that they can't help themselves, they can't change or change very much, that so long as we live under this system we have little choice but to go along in this destruction, to keep pouring on the gas

[1] Tom Bawden, "Carbon dioxide in atmosphere at highest level for 5 million years," *The Independent*, May 10th, 2013 at http://www.independent.co.uk/news/uk/home-news/carbon-dioxide-in-atmosphere-at-highest-level-for-5-million-years-8611673.html.
[2] Justin Gillis, "Heat-trapping gas passes milestone, raising fears," *New York Times*, May 10, 2013. Scripps Institution of Oceanography, *Scripps News*, April 23, 2013 at http://scrippsnews.ucsd.edu/Releases/?releaseID=1347.

instead of slamming on the brakes, and that the only alternative -- impossible as this may seem right now -- is to overthrow this global economic system and all of the governments of the 1% that prop it up, and replace them with a global economic democracy, a radical bottom-up political democracy, an *ecosocialist civilization*. I argue that, although we are fast approaching the precipice of ecological collapse, the means to derail this trainwreck are in the making as, around the world we are witnessing a near simultaneous global mass democratic "awakening" as the Brazilians call it, almost a global uprising from Tahir Square to Zacotti Park, from Athens to Istanbul to Beijing and beyond such as the world has never seen. To be sure, like Occupy Wall Street, these movements are still inchoate, are still mainly protesting what's wrong rather than fighting for an alternative social order. Like Occupy, they have yet to clearly and robustly answer that crucial question, "Don't like capitalism, what's your alternative?" Yet they are working on it, and they are all instinctively and radically democratic and in this lies our hope. I'm going to make my case in the form of six theses:

1. Capitalism is, overwhelmingly, the main driver of planetary ecological collapse

From climate change to resource overconsumption to pollution, the engine that has powered three centuries of accelerating economic development revolutionizing technology, science, culture, and human life itself is, today, a roaring out-of-control locomotive mowing down continents of forests, sweeping oceans of life, clawing out mountains of minerals, drilling, pumping out lakes of fuels, devouring the planet's last accessible resources to turn them all into "product" while destroying fragile global ecologies built up over eons of time. Between 1950 and 2000 the global human population more than doubled from 2.5 to 6 billion, but in these same decades consumption of major natural resources soared more than 6 fold on average, some much more. Natural gas consumption grew nearly 12 fold, bauxite (aluminum ore) 15 fold. And so on.[3] At current rates, Harvard biologist E.O Wilson says that "half the world's great forests have already been leveled and half the world's plant and animal species may be gone by the end of this century." Corporations aren't necessarily evil, though plenty are diabolically evil, but they can't help themselves. They're just doing what they're supposed to do for the benefit of their shareholders. Shell Oil can't help but loot Nigeria and the Arctic and cook the climate. That's what shareholders demand.[4] BHP Billiton, Rio Tinto and other mining giants can't resist mining Australia's abundant coal and exporting it to China and India. Mining accounts for 19% of Australia's GDP and substantial employment even as coal combustion is the single worst driver of global warming. IKEA can't help but level the forests of Siberia and Malaysia to feed the Chinese mills building its flimsy disposable furniture (IKEA is the *third largest consumer of lumber in the world*). Apple can't help it if the cost of extracting the "rare earths" it needs to make millions of new iThings each year is the destruction of the eastern Congo – violence, rape, slavery, forced induction of child soldiers, along with poisoning local waterways.[5] Monsanto and DuPont and Syngenta and Bayer Crop Science

[3] Michael T. Klare, *The Race for What's Left* (New York: Picador 2012), p. 24 Table 1.1. Jeffrey Sachs calculates that in value terms, between 1950 and 2008 the global human population rose from 2.5 to 7 billion, so less than tripled, while global GDP multiplied 8 times. *Common Wealth: Economics for a Crowded Planet* (New York: Penguin Books, 2008), p. 19.

[4] On Shell's impact on Africa see Nimo Bassey, *To Cook a Continent: Destructive Extraction and the Climate Crisis in Africa* (Cape Town: Pambazuka Press 2012).

[5] Delly Mawazo Sesete of Change.org, writing in the *Guardian* newspaper says, "I am originally from the North Kivu province in the eastern region of the Democratic Republic of the Congo, where a deadly conflict has been raging for over 15 years. While that conflict began as a war over ethnic tension, land rights and politics, it has increasingly turned to being a war of profit, with various armed groups fighting one another for control of strategic mineral reserves. Near the area where I grew up, there are mines with vast amounts of tungsten, tantalum, tin, and gold – minerals that make most consumer electronics

have no choice but to wipe out bees, butterflies, birds, small farmers and extinguish crop diversity to secure their grip on the world's food supply while drenching the planet with their Roundups and Atrazines and neonicotinoids.[6] This is how giant corporations are wiping out life on earth in the course of a routine business day. And the bigger the corporations grow, the worse the problems become.

In Adam Smith's day, when the first factories and mills produced hat pins and iron tools and rolls of cloth by the thousands, capitalist freedom to make whatever they wanted didn't much matter because they didn't have much impact on the global environment. But today, when everything is produced in the millions and billions, then trashed today and reproduced all over again tomorrow, when the planet is looted and polluted to support all this frantic and senseless growth, it matters – a lot.

The world's climate scientists tell us we're facing a *planetary emergency*. They've been telling us since the 1990s that if we don't cut global fossil fuel greenhouse gas emissions by 80-90% below 1990 levels by 2050 we will cross critical tipping points and global warming will accelerate beyond any human power to contain it. Yet despite all the ringing alarm bells, no corporation and no government can oppose growth and, instead, every capitalist government in the world is putting pedal to the metal to accelerate growth, to drive us full throttle off the cliff to collapse. Marxists have never had a better argument against capitalism than this inescapable and apocalyptic "contradiction".

2. Solutions to the ecological crisis are blindingly obvious but we can't take the necessary steps to prevent ecological collapse because, so long as we live under capitalism, economic growth has to take priority over ecological concerns or the economy will collapse and mass unemployment will be the result.

We all know what we have to do: suppress greenhouse gas emissions. Stop over-consuming natural resources. Stop the senseless pollution of the earth, waters, and atmosphere with toxic chemicals. Stop producing waste that can't be recycled by nature. Stop the destruction of biological diversity and insure the rights of other species to flourish. We don't need any new technological breakthroughs to solve these problems. Mostly, we *just stop doing what we're doing*. But we can't stop because *we're all locked into* an economic system in which companies have to grow to compete and reward their shareholders and because *we all need the jobs.*

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in the world function. These minerals are part of *your* daily life. They keep your computer running so you can surf the internet. They save your high score on your Playstation. They make your cell phone vibrate when someone calls you. While minerals from the Congo have enriched your life, they have often brought violence, rape and instability to my home country. That's because those armed groups fighting for control of these mineral resources use murder, extortion and mass rape as a deliberate strategy to intimidate and control local populations, which helps them secure control of mines, trading routes and other strategic areas. Living in the Congo, I saw many of these atrocities firsthand. I documented the child slaves who are forced to work in the mines in dangerous conditions. I witnessed the deadly chemicals dumped into the local environment. I saw the use of rape as a weapon. And despite receiving multiple death threats for my work, I've continued to call for peace, development and dignity in Congo's minerals trade." "Apple: time to make a conflict-free iPhone," *Guardian*, December 30, 2011 at http://www.guardian.co.uk/commentisfree/cifamerica/2011/dec/30/apple-time-make-conflict-free-iphone. For more detail see conflictminerals.org. See also: Peter Eichstaedt, *Consuming the Congo: War and Conflict Minerals in the World's Deadliest Place* (Chicago: Lawrence Hill, 2011).

[6] Lauren McCauley, "Herbicides for GM0s driving monarch butterfly populations to 'ominous' brink," *Common Dreams,* March 14, 2013 at http://www.commondreams.org/headline/2013/03/14-3.

Take climate change:

James Hansen, the world's preeminent climate scientist, has argued that to save the humans:

> "Coal emissions must be phased out as rapidly as possible or global climate disasters will be a dead certainty. . . Yes, [coal, oil, gas] most of the fossil fuels must be left in the ground. That is the explicit message that the science provides.
>
> Humanity treads today on a slippery slope. As we continue to pump greenhouse gases in the air, we move onto a steeper, even more slippery incline. We seem oblivious to the danger – unaware of how close we may be to a situation in which a catastrophic slip becomes practically unavoidable, a slip where we suddenly lose all control and are pulled into a torrential stream that hurls us over a precipice to our demise." (James Hansen, 2009) [7]

But how can we do this under capitalism? After his climate negotiators stonewalled calls for binding limits on CO_2 emissions at Copenhagen, Cancun, Cape Town and Doha, President Obama is now trying to salvage his environmental "legacy" by ordering his EPA to impose "tough" new emissions limits on existing power plants, especially coal-fired plants.[8] But this won't salvage his legacy or, more importantly, his daughters' future because how much difference would it make, really, if every coal-fired power plant in the U.S. shut down tomorrow *when U.S. coal producers are free to export their coal to China*, which they are doing, and when China is building another coal-fired power plan every week? The atmosphere doesn't care where the coal is burned. It only cares how much is burned. Yet how could Obama tell American mining companies *to stop mining coal*? This would be tantamount to socialism. But if we *do not stop* mining and burning coal, capitalist freedom and private property is the least we'll have to worry about.

Same with Obama's "tough" new fuel economy standards. In August 2012 Obama boasted that his new Corporate Average Fuel Economy (CAFE) standards would "double fuel efficiency" over the next 13 years to 54.5 miles per gallon by 2025, up from 28.6 mpg at present – cutting vehicle CO_2 emissions in half, so helping enormously to "save the planet." But as the Center for Biological Diversity and other critics have noted, Obama was lying. First, his so-called "tough" new CAFE standards were so full of loopholes, negotiated with Detroit, that they actually encourage *more gas-guzzling, not less.*[9] That's because the standards are based on a sliding scale according to "vehicle footprints" – the bigger the car, the less mileage it has to get to meet its "standard." So in fact Obama's "tough" standards are (surprise) custom designed to promote what Detroit does best – produce giant Sequoias, mountainous Denalis, Sierras, Yukons, Tundras and Ticonderogas, Ram Chargers and Ford F series luxury trucks, grossly obese Cadillac Escalades, soccer kid hauler Suburbans, even 8,000 (!) pound Ford Excursions – and let these gross gas hogs meet the "fleet standard". Many of these ridiculously oversized and over-accessorized behemoths are *more than twice the*

[7] James Hansen, *Storms of My Grandchildren* (New York: Bloomsbury 2009), pp. 70, 172-173,
[8] John M. Broder, "Obama readying emissions limits on power plants," *New York Times*, June 20, 2013.
[9] Center for Biological Diversity, "New mileage standards out of step with worsening climate crisis," press release, August 28, 2012 athttp://www.biologicaldiversity.org/news/press_releases/2012/vehicle-emissions-08-28-2012.html. Also, Common Dreams staff, "New mileage standards encourage more gas-guzzling, not less: report," *Common Dreams,* August 28, 2012 at https://www.commondreams.org/headline/2012/08/28-8.

weight of cars and pickup trucks in the 1950s.[10] These cars and "light" trucks are among the biggest selling vehicles in America today (GM's Sierra is #1) and they get worse gas mileage than American cars *half a century ago.* Cadillac's current Escalade gets worse mileage than its chrome bedecked tail fin-festooned land yachts of the mid-1950s! [11] Little wonder Detroit applauded Obama's new CAFE standards instead of damning them as usual. Secondly, what would it matter even if Obama's new CAFE standards actually *did* double fleet mileage – when American and global vehicle fleets are *growing exponentially?* In 1950 Americans had one car for every three people. Today we have 1.2 cars for every American. In 1950 when there were about 2.6 billion humans on the planet, there were 53 million cars on the world's roads – about one for every 50 persons. Today, there are 7 billion people but more than 1 billion cars and industry forecasters expect there will be 2 to 2.5 billion cars on the world's roads by mid-century. China alone is expected to have a billion.[12] So, at the end of the day, incremental half measures like CAFE standards can't stop rising GHG missions. Barring some technical miracle, the only way to cut vehicle emissions is to just *stop making them* -- *drastically suppress vehicle production*, especially of the worst gas hogs. In theory, Obama could simply order GM to stop building its humongous gas guzzlers and switch to producing small economy cars. After all, the federal government *owns the company*! But of course, how could he do any such thing? Detroit lives by the mantra "big car big profit, small car small profit." Since Detroit has never been able to compete against the Japanese and Germans in the small car market, which is already glutted and nearly profitless everywhere, such an order would only doom GM to failure, if not bankruptcy (again), throw masses of workers onto the unemployment lines (and devalue the GM stock in the feds' portfolio). So given capitalism, Obama is in fact, powerless. He's locked in to promoting the endless growth of vehicle production, even of the worst polluters – and lying about it all to the public to try to patch up his pathetic "legacy." And yet, if we don't suppress vehicle production, how can we stop rising CO_2 emissions?

In the wake of the failure of climate negotiators from Kyoto to Doha to agree on binding limits on GHG emissions, exasperated British climate scientists Kevin Anderson and Alice Bows at the Tyndall Centre, Britain's leading climate change research center, wrote in September 2012 that we need an entirely "new paradigm": government policies must "radically change" if "dangerous" climate change is to be avoided:

> We urgently need to acknowledge that the development needs of many countries leave the rich western nations with little choice but to *immediately*

[10] A full-size 1955 Chevrolet Bel Air weighed 3,100 pounds. A '55 Ford F-100 pickup truck also weighed 3100 (3300 with the optional V-8 motor). Even a 1955 Cadillac El Dorado, icon of fifties conspicuous consumption, only weighed 5050 pounds -- chrome bullets, tail fins and all. By comparison, today even a compact Toyota Prius weighs 3274 pounds (could it be the batteries?) while your typical full size Ford Taurus weighs more than 4,300 pounds, pickup trucks and big SUVs start at around 6,000 pounds and go up from there to 7-8000 pounds. Even though the occasional honest driver will concede he/she doesn't really "need" all this bulk and horsepower to load up at the mall, as a cheerful Texas Ford salesman noted: "We haven't found a ceiling to this luxury truck market." Joseph B. White, "Luxury pickups stray off the ranch," *Wall Street Journal*, March 21, 2012.

[11] Your typical 4,428 pound 1955 Cadillac Coupe DeVille got 12.9 mpg in city driving according to *Motor Trend Magazine* whereas your typical 2013 Cadillac Escalade gets 10mpg in the city (12mpg "combined" city and highway). Your typical 2013 Chevrolet Silverado K15 truck gets just 9 mpg hauling those heavy bags of groceries home from the mall. This is after *six decades* of Detroit fuel economy "improvements" – and Obama says Detroit is going to "double its fleet mileage in 20 years". Good luck on that. Mileage figures for the Cadillac are from *Cadillac History 1955* at http://www.100megsfree4.com/cadillac/cad1950/cad55s.htm. For the Silverado at www.fuel economy.gov.

[12] For forecasts of China's vehicle fleet and its implications see Craig Simons, *The Devouring Dragon* (New York: St. Martins Press, 2013), p. 200.

> *and severely curb their greenhouse gas emissions*... [The] misguided belief that commitments to avoid warming of 2 degrees C can still be realized with incremental adjustments to economic incentives. A carbon tax here, a little emissions trading there and the odd voluntary agreement thrown in for good measure will not be sufficient... Long-term end-point targets (for example, 80% by 2050) have no scientific basis. What governs future global temperatures and other adverse climate impacts are the emissions from yesterday, today, and those released in the next few years (emphasis added).[13]

And not just scientists. In its latest world energy forecast released on November 12, 2012, the International Energy Agency (IEA) warns that despite the bonanza of fossil fuels now made possible by fracking, horizontal and deepwater drilling, *we can't consume them if we want to save the humans*: "the climate goal of limiting global warming to 2 degrees Centigrade is becoming more difficult and costly with each year that passes... No more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 degree C goal..." [14] Of course the science could be wrong about this. But so far climate scientists have consistently *underestimated* the speed and ferocity of global warming, and even prominent climate change deniers have folded their cards.[15]

Emergency contraction or global ecological collapse

Still, it's one thing for James Hansen or Bill McKibben of 350.org to say we need to *"leave the coal in the hole, the oil in the soil, the gas under the grass,"* to call for "severe curbs" in GHG emissions – in the abstract. *But think about what this means in our capitalist economy.* Most of us, even passionate environmental activists, don't really want to face up to the economic implications of the science we defend. That's why, if you listen to environmentalists like Bill McKibben, for example, you will get the impression that global warming is mainly driven by fossil fuel-powered electric power plants, so if we just "switch to renewables" this will solve the main problem and we can carry on with life more or less as we do now. Indeed, "green capitalism" enthusiasts like Thomas Friedman and the union-backed "green jobs" lobby look to renewable energy, electric cars and such as "*the next great engine of industrial growth*" – the perfect win-win solution. This is a not a solution. This is a delusion: because greenhouse gasses are produced *across the economy* not just by or even mainly by power plants. Globally, fossil fuel-powered electricity generation accounts for 17% of GHG emissions, heating accounts for 5%, miscellaneous "other" fuel combustion 8.6%, industry 14.7%, industrial processes another 4.3%, transportation 14.3%, agriculture 13.6%, land use changes (mainly deforestation) 12.2%.[16] This means, for a start, that *even if we immediately replaced every fossil fuel powered electric generating plant on the planet with 100% renewable solar, wind and water power*, *this would only reduce global GHG emissions by*

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[13] "A new paradigm for climate change," *Nature Climate Change*, Vol. 2 September 2012, pp. 639-640
[14] IEA, *World Energy Outlook 2012* Executive Summary (November 12, 2012), p. 3 at https://www.iea.org/publications/freepublications/publication/English.pdf.
[15] For a recent summary of the peer-reviewed literature see Glenn Scherer and DailyClimate.org, "Climate science predictions prove too conservative," *Scientific American December* 6, 2012 online at http://www.scientificamerican.com/article.cfm?id=climate-science-predictions-prove-too-conservative. Prominent ex-denier Richard A. Muller published his mea culpa on the Op-Ed page of the *New York Times:* "The conversion of a climate-change skeptic," July 28, 2012.
[16] World Resources Institute, *WRI Navigating the Numbers*, Table 1. pp. 4-5, at http://pdf.wri.org/navigating_numbers.pdf.

around 17%. What *this* means is that, far from launching a new green energy-powered "industrial growth" boom, barring some tech-fix miracle, the only way to impose "immediate and severe curbs" on fossil fuel production/consumption would be to impose an *EMERGENCY CONTRACTION in the industrialized countries:* drastically retrench and in some cases shut down industries, even entire sectors, across the economy and around the planet – not just fossil fuel producers but all the industries that consume them and produce GHG emissions – autos, trucking, aircraft, airlines, shipping and cruise lines, construction, chemicals, plastics, synthetic fabrics, cosmetics, synthetic fiber and fabrics, synthetic fertilizer and agribusiness CAFO operations, and many more. Of course, no one wants to hear this because, given capitalism, this would unavoidably mean mass bankruptcies, global economic collapse, depression and mass unemployment around the world. That's why in April 2013, in laying the political groundwork for his approval of the XL pipeline in some form, President Obama said "The politics of this are tough." The earth's temperature probably isn't the "number one concern" for workers who haven't seen a raise in a decade; have an underwater mortgage; are spending $40 to fill their gas tank, can't afford a hybrid car, and face other challenges."[17] Obama wants to save the planet but *given capitalism* his "number one concern" has to be growing the economy, growing jobs. Given capitalism, today, tomorrow, next year and every year, economic growth will *always* be the overriding priority – till we barrel right off the cliff to collapse.

The necessity of denial and delusion

There's no *technical* solution to this problem and no *market* solution either. In a very few cases – electricity generation is the main one – a broad shift to renewables could indeed sharply reduce fossil fuel emissions in that sector. But if we just use "clean" "green" energy to power more growth, consume ever more natural resources, then we solve nothing and would still be headed to collapse. Agriculture is another sector in which reliance on fossil fuels could be sharply reduced – by abandoning synthetic fertilizers and pesticides and switching to organic farming. And there's no downside there – just the resistance of the agribusiness industrial complex. But for the rest of the economy – mining, manufacturing, transportation, chemicals, most services (eg. construction, tourism, advertising, etc.), there are no such easy substitutes. Take transportation. There are no solar powered ships or airplanes or trains on anyone's drawing boards. Producing millions of electric cars instead of millions of gasoline-powered cars, as I explained elsewhere, would be just as ecologically destructive and polluting, if in somewhat different ways, even if they were all run on solar power.[18] Substituting biofuels for fossil fuels in transportation just creates different but no less environmentally destructive problems: converting farm land to raise biofuel feedstock pits food production against fuels. Converting rainforests, peatlands, savannas or grasslands to produce biofuels releases more CO_2 into the atmosphere than the fossil fuels they replace and accelerates species extinction.[19] More industrial farming means more demand for water, synthetic fertilizers and pesticides. And so on. *Cap and trade* schemes can't cut fossil fuel emissions because, as I also explained elsewhere[20] business understands, even if some environmentalists do not, that "dematerialization" is a fantasy, that there's no win-win tech solution, that capping emissions means cutting growth. Since cutting growth is unacceptable to business, labor, and governments, cap and trade has been abandoned everywhere.[21]

[17] The Hill blog http://thehill.com/blogs/e2-wire/e2-wire/291787-obama-on-climate-change-the-politics-of-this-are-tough.
[18] See my "Green capitalism," op cit. pp. 131-133.
[19] Eg. David Biello, "The false promise of biofuels," *Scientific American*, August 2011, pp. 59-65.
[20] Smith, "Green capitalism," op cit. pp. 117-122.
[21] Ibid.

Carbon taxes can't stop global warming either because they *do not* cap emissions. That's why fossil fuel execs like Rex Tillerson, CEO of ExxonMobil (the largest private oil company in the world) and Paul Anderson, CEO of Duke Energy (the largest electric utility in the U.S.) *support* carbon taxes. They understand that carbon taxes would add something to the cost of doing business, like other taxes, but they pose no limit, no "cap" on growth.[22] Exxon predicts that, carbon tax or no carbon tax, by 2040 global demand for energy is going to grow by 35%, 65% in the developing world and nearly all of this is going to be supplied by fossil fuels. ExxonMobil is not looking to "leave the oil in the soil" as a favor to Bill McKibben and the humans. ExxonMobil is looking to pump it and burn it all as fast as possible to enrich its shareholders.[23]

James Hansen, Bill McKibben, Barack Obama – and most of us really, don't want to face up to the economic implications of the need to put the brakes on growth and fossil fuel-based overconsumption. We all "need" to live in denial, and believe in delusions that carbon taxes or some tech fix will save us because we all know that capitalism has to grow or we'll all be out of work. And the thought of replacing capitalism seems so impossible, especially given the powers arrayed against change. But what's the alternative? In the not-so-distant future, this is all going to come to a screeching halt one way or another – either we seize hold of this out-of-control locomotive and wrench down this overproduction of fossil fuels, or we ride this train right off the cliff to collapse.

Same with resource depletion:

We in the industrialized "consumer economies" are not just over-consuming fossil fuels. We're over-consuming *everything.* From fish to forests, minerals to metals, oil to fresh water, we're consuming the planet like there's no tomorrow.[24] Ecological "footprint" scientists tell us that we in the industrialized nations are now consuming resources and sinks at the rate of 1.5 planets per year, that is, we're using natural resources like fish, forests, water, farmland, and so on at half-again the rate that nature can replenish them.[25] According to the World Bank, the wealthiest 10% of the world's people account for almost 60% of consumption expenditures and the top 20% account for more than 76% of global consumption whereas the bottom 40% of the world's population account for just 5%. Even the bottom 70% of the world's

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[22] Ibid.

[23] ExxonMobil, *The Outlook for Energy: A View to 2040* (December 2012) at http://exxonmobil.com/corporate/files/news_pub_eo2013.pdf. See also, Jon Queally, "BP's Big Plan: Burn it. Burn it all," *Common Dreams*, January 17, 2013 at https://www.commondreams.org/headline/2013/01/17.

[24] Eg. John Parnell, "World on course to run out of water, warns Ban Ki-moon," *Guardian*, May 22, 22013. Gaia Vince, "How the world's oceans could be running out of fish," *BBC News Online*, September 12, 2012 at http://www.bbc.com/future/story/20120920-are-we-running-out-of-fish. And as tropical forests, biodiversity is being sacrificed even in nominally protected areas at an alarming rate. See William F. Laurance et al. "Averting biodiversity collapse in tropical forest protected areas," *Nature*, no. 489 September 12, 2012 pp. 290-294. "Widespread local 'extinctions' in tropical forest 'remnants'" Also, *ScienceDaily*, August 14, 2012 at http://www.sciencedaily.com/releases/2012/08/120814213404.htm. On minerals and oil see Michael T. Klare, *The Race for What's Left* (New York: Picador 2012).

[25] Ecological "footprint" studies show that today humanity uses the equivalent of 1.5 planets to provide the resources we use and absorb our waste. This means it now takes the Earth one year and six months to regenerate what we use in a year. Moderate UN scenarios suggest that if current population and consumption trends continue, by the 2030s, we will need the equivalent of two Earths to support us. And of course, we only have one. Turning resources into waste faster than waste can be turned back into resources puts us in global ecological "overshoot" depleting the very resources on which human life and biodiversity depend. See the Global Footprint Network at http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/.

population account for barely 15.3% of global consumption expenditures.[26] Needless to say, those 70% want and deserve a higher material standard of living. Yet if the whole world were to achieve this *by consuming like Americans*, we would need something like five more planets worth of natural resources and sinks for all of that.[27] *Think what this means.*

Take the case of China. Columbia University's Earth Policy Institute predicts that if China keeps growing by around 8% per year, its current rate, Chinese average *per capita* consumption will reach current U.S. level by around 2035. But to provide the natural resources for China's 1.3+ billion consume like America's 330 million, the Chinese, roughly 20% of the world's population, will consume as much oil *as the entire world* consumes today, they will consume 69% of current world grain production, 62% of the current world meat production, 63% of current world coal consumption, 35% of current world steel consumption, 84% of current world paper consumption. (See Table 1.) Well, where on earth are the Chinese going to find the resources (not to mention sinks) to support all this consumption? China certainly doesn't have the resources. That's why the Chinese are buying up the planet. And that's just China. What about the other four-fifths of humanity? What are *they* going to consume in 2035?

Table 1:
Annual consumption of key resources in China and U.S., latest year, with projections for China to 2035, compared to current world production

		Consumption		Projected Consumption*	Production
		Latest Year		2035	Latest Year
Commodity	Unit	U.S.	China	China	World
Grain	Million Tons	338	424	1,505	2,191
Meat	Million Tons	37	73	166	270
Oil	Million Barrels per Day	19	9	85	86
Coal	Million Tons of Oil Equiv.	525	1,714	2,335	3,731
Steel	Million Tons	102	453	456	1,329
Fertilizer	Million Tons	20	49	91	214
Paper	Million Tons	74	97	331	394

*Projected Chinese consumption in 2035 is calculated assuming per-capita consumption will be equal to the current U.S. level, based on projected GDP growth of 8 percent annually. Latest year figures for grain, oil, coal, fertilizer and paper are from 2008. Latest year figures for meat and steel are from 2010.

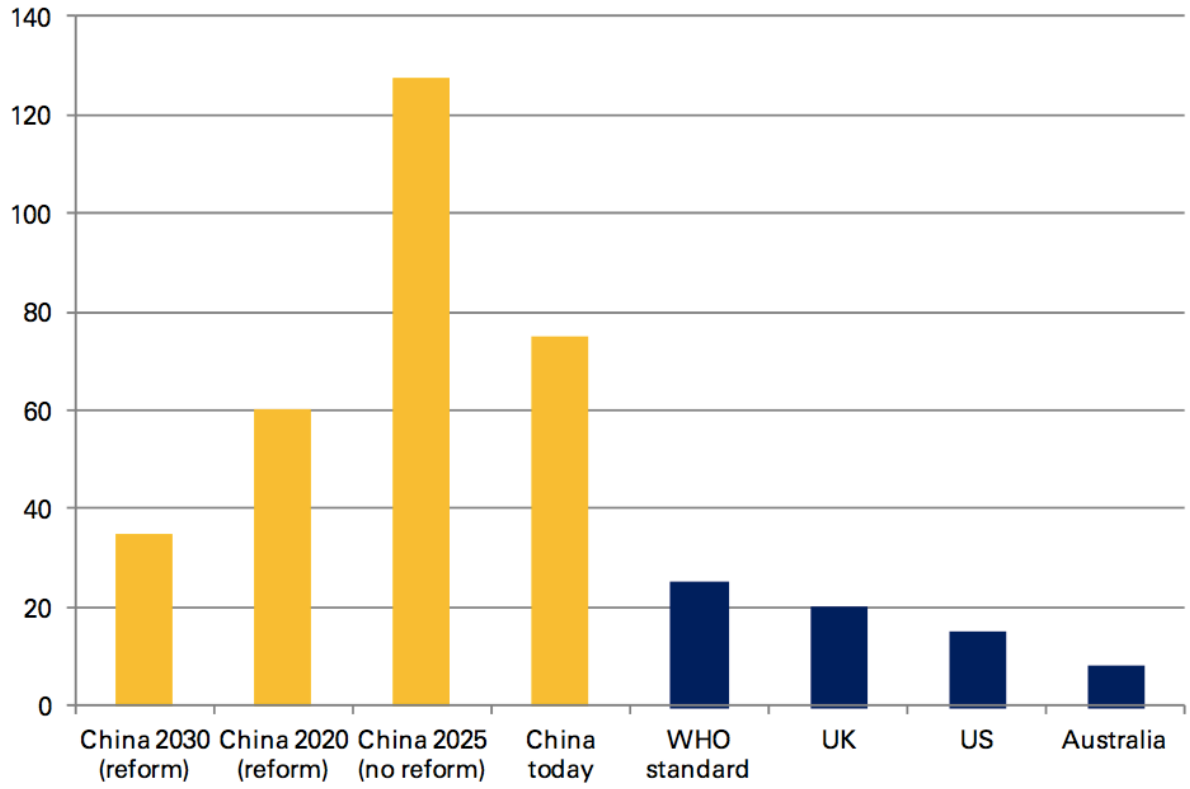
Source: Earth Policy Institute

[26] World Bank, *2008 World Development Indicators*, p. 4 Table 1J at http://data.worldbank.org/sites/default/files/wdi08.pdf.
[27] Worldwatch Institute, *2010 State of the World: Transforming Cultures From Consumerism to Sustainability* (New York: Norton, 2010) pp. 3-7ff. Also Alan Durning, *How Much is Enough?* (New York: Norton 1992). Avatar.

China's capitalist environmental nightmare

As Beijing has been choking on smog this year, Deutsche Bank analysts gloomily conclude that, barring extreme reforms, Chinese coal consumption and increased car ownership will push pollution (http://chinadigitaltimes.net/china/pollution/) levels 70% higher by 2025. They say that even if China's economy slowed to 5% growth each year, its annual coal consumption would still rise to 6 billion tons (5.4 tonnes) by 2022, from the current 3.8 billion tons. Car ownership is expected to increase over the years to 400 million in 2030 from the current 90 million. With those two figures, it will be very difficult for the government to reduce the national average of PM2.5, or air pollution that is small enough to enter the bloodstream. The current national average is 75 micrograms per cubic meter. In January, PM2.5 levels in Beijing reached 900 micrograms per cubic meter.

Figure 1: Without reform, China's air pollution could worsen by another 70%: our forecast of PM2.5 levels



Source: Deutsche Bank estimates, WHO, NASA

Already, as resource analyst Michael Klare reviews in his latest book *The Race for What's Left*, around the world existing reserves of oil, minerals and other resources "are being depleted at a terrifying pace and will be largely exhausted in the not-too-distant future." This is driving miners and drillers to the ends of the earth, the bottom of oceans, to the arctic. We're running out of planet to plunder so fast that serious people like Google's Larry Page and Eric Schmidt have partnered with film director James Cameron to make life imitate art, to explore

the possibility of mining asteroids and near planets. *Avatar* – the perfect capitalist solution to resource exhaustion (but the Marines will be Chinese). [28]

"Wild facts" and unquestioned assumptions

In mainstream discourse it is taken as an absolutely *unquestioned given* by scientists like James Hansen, environmentalists like George Monbiot, not to mention CEOs and presidents, that demand for everything must *grow infinitely,* that economies must grow *forever.* That's why Hansen, Monbiot, James Lovelock and others tell us that, Fukishima notwithstanding, we "have to" *go nuclear* for energy production. In their view, the human population is headed for 9 billion, all these billions want to consume like Americans so we will need more power for their washing machines, air conditioners, iPads, TVs and (electric) SUVs, we can't burn more fossil fuels to produce this power because it will cook the planet, renewables are great but can't reliably and everywhere meet relentlessly growing "base load" demand for electricity 24/7 – *therefore* they tell us, we have "no choice" but to turn to nuclear power (Besides, what could go wrong with the "newest" "safest" "fourth generation" reactors? What indeed?).[29] But not one of these people stops to ask the obvious question, which is *where are all the resources going to come from to support insatiable consumption on a global scale?* In the capitalist lexicon there is no concept of "too much." The word "overconsumption" cannot be found in Econ. 101 text books except as a temporary market aberration, soon to be erased as "perfect competition" matches supply to demand and shortages and surpluses vanish down the gullet of the consumer. The fact that we live on one small planet with finite resources and sinks is just beyond the capitalist imagination *because,* as Herman Daly used to say, the "wild facts" of environmental reality demolish their underlying premise of the viability of endless growth on a finite planet. So inconvenient facts must be *denied*, suppressed or ignored. And they are. When, on May 10th 2013, climate scientists announced the latest "wild fact" that the level of heat-trapping CO_2 concentrations in the atmosphere had passed the long-feared milestone of 400ppm, an event fraught with ominous consequences for us all, this was met with total silence from the world's economic and political elites. President Obama was busy preparing his own announcement -- that he was clearing the way for *accelerated natural-gas exports* by approving a huge new $10 billion Freeport LNG facility in Texas. Obama's Dept. of Energy gave Freeport LNG the green light because it "found the prospective benefits from exporting energy outweighed concerns about possible downsides." No surprise there. Freeport LNG chief Michael Smith wasn't anticipating downsides or any change in Obama's priorities. He said: "I hope this means that more facilities will get approval in due time, sooner than later. The country needs these exports for jobs, for trade, and for geopolitical reasons..."[30] That's why, even though, at some repressed level, most Americans understand that fracking the planet is disastrous, even suicidal for their own children in the long run, yet still *for the present* they have to make the mortgage payments, fill the gas tank, and so they

[28] Michael T. Klare, *The Race for What's Left*, p. 12 (my italics). AP, "Tech tycoons in asteroid mining venture," *Guardian*, April 20, 2012.
[29] Hansen, *Storms*, chapter 9. Independent Voices: "James Lovelock: Nuclear power is the only green solution," *Independent*, May 24, 2004 at http://www.independent.co.uk/voices/commentators/james-lovelock-nuclear-power-is-the-only-green-solution-6169341.html. George Monbiot the Guardian columnist has argued this in many venues but see in particular his blog piece: "The moral case for nuclear power," August 8, 2011 at http://www.monbiot.com/2011/08/08/the-moral-case-for-nuclear-power/. Also, Ted Nordhaus and Michael Shellenberger, "Going green? Then go nuclear," *Wall Street Journal* op-ed, May 23, 2013.
[30] Keith Johnson and Ben Lefebvre, "U.S. approves expanded gas exports," *Wall Street Journal*, May 18th, 2013.

have little choice but to live in denial and support fracking.[31] And so we go, down the slippery slope.

No one stops to ask "what's it all for?" Why do we "need" all this energy? Why do we "need" all the stuff we produce with all this energy? It's high time we start asking this question. Economists tell us that two-thirds of America's own economy is geared to producing "consumer" goods and services. To be sure, we need food, clothing, housing, transportation, and energy to run all this. But as Vance Packard astutely observed half a century ago, most of what corporations produce today is produced not for the needs of people but *for the needs of corporations to sell to people.* From the ever-more obscene and pointless vanities of ruling class consumption – the Bentleys and Maseratis, the Bergdorf Goodman designer collections, the penthouses and resorts and estates and yachts and jets, to the endless waste stream of designed-in obsolescence-driven mass market fashions, cosmetics, furniture, cars, "consumer electronics," the obese 1000 calorie Big Macs with fries, the obese and overaccesorized SUVs and "light trucks," the obese and ever-growing McMansions for ever-smaller middle class families, the whole-house central air conditioning, flat screen TVs in every room, iThings in every hand, H&M disposable "fast fashion" too cheap to bother to clean,[32] the frivolous and astonishingly polluting jet and cruise ship vacations everywhere (even *Nation* magazine cruises with Naomi Klein!), and all the retail malls, office complexes, the packaging, shipping industries, the junk mail/magazine/catalog sales companies, the advertising, banking and credit card "industries" that keep this perpetual consumption machine humming along, not to mention the appalling waste of the arms industry, which is just total deliberate waste and destruction, the vast majority – I would guess *at least three quarters* of all the goods and services we produce today *just do not need to be produced at all. It's all just a resource-hogging, polluting* waste. My parents lived passably comfortable working class lives in the 1940s and 50s without half this stuff and they weren't living in caves. We could all live happier, better, more meaningful lives without all this junk – and we *do not* need ever-more energy, solar or otherwise, to produce it. We could shut down all the coal-powered electric generators around the world, most of which, especially in China, are currently dedicated to powering the production of superfluous and disposable junk we don't need and replace them with – *nothing.* How's *that* for a sustainable solution? Same with

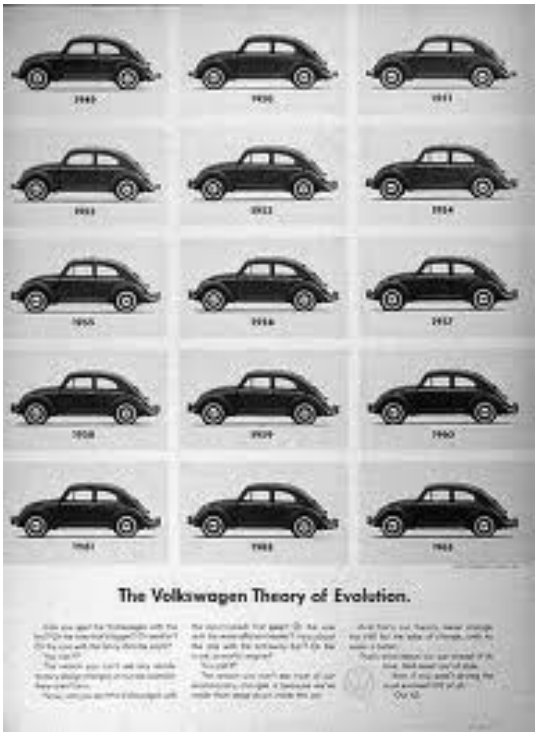
[31] John Vogel, "Methane gas 'fracking': 3 polls show public leaning to toward yes," *American Agriculturalist*, April 9, 2013 at http://farmprogress.com/story-methane-gas-fracking-3-polls-show-public-leaning-toward-yes-9-96948. Karen DeWitt, "Poll shows increased support for fracking," *North Country Public Radio*, September 13, 2012 at http://www.northcountrypublicradio.org/news/story/20474/20120913/poll-shows-increased-support-for-fracking.

[32] Clothing designer Eliza Starbuck says of ultra-cheap producers like H&M "It's throwaway fashion or 'trashion.' If their prices are that cheap that people are throwing their disposable income at them – only to find that the clothes fall apart on the hangers after a wash or two – they're just creating garbage. . . It takes such a huge amount of human energy and textile fibers, dyes, and chemicals to create even poor quality clothes. They may be offering fashions at a price anyone can afford in an economic crunch, but they're being irresponsible about what happens to the goods after the consumers purchase them." Jasmin Malik Chua, "Is H&M's new lower-priced clothing encouraging disposable fashion?" *ecouterre*, September 28, 2010 at http://www.ecouterre.com/is-h-m-new-lower-priced-clothing-encouraging-disposable-fashion/2/. And H&M takes "disposable" literally. As the *New York Times* reported in 2012, H&M's employees systematically slash and rip perfectly good unsold clothes before tossing them in dumpsters at the back of the chain's 34th St. store in Manhattan – to make sure they can't be sold but thus adding pointlessly to landfills rather than donating them to charity. *It is little remarked that capitalism is the first economic system in which perfectly serviceable, even brand new goods from clothes to automobiles (recall the "cash for clunkers" rebates) are deliberately destroyed so as to promote production of their replacements.* I'll explore this interesting theme further elsewhere. See Jim Dwyer, "A clothing clearance where more than just the prices are slashed," *New York Times,* January 5, 2010. Also, Ann Zimmerman and Neil Shah, "Taste for cheap clothes fed Bangladesh boom," *Wall Street Journal*, May 13, 2013.

nuclear. Since the 1960s, Japan built 54 nuclear power plants. But these were built not so much to provide electricity for the Japanese (their population is falling) as to power Japan's mighty manufacturing export engine producing all those disposable Gameboys and TVs and Toyotas and Hondas the world does not need and can no longer afford to "consume".

Endless growth or repair, rebuild, upgrade, recycle?

So, for example, at the risk of sounding ridiculous, we don't really *need* a global automobile industry. At least we don't need an industry cranking out hundreds of millions of new cars every year because the industry is built on the principle of designed-in obsolescence, on insatiable repetitive consumption, on advertising and "cash for clunkers" programs to push you to crush your perfectly good present car for a "new" "improved" "bigger" "more luxurious" model that is, in reality, trivially different, sometimes even inferior to the one you just junked. What we need is a different approach to transportation. To build a sustainable transportation system, we would have to divert most resources from auto production to public transportation, trains, busses, and bicycling. But of course bikes and public transport aren't feasible everywhere and for every task, particularly for those who live in the suburbs or the country or in the mostly rural developing world. So we would still need some cars and trucks – but many fewer if we "degrow" the economy to produce just what we need instead of for profit. As the VW ads below point out, properly designed and engineered cars can be sturdy but simple, economical to drive, easily, even DIY serviceable and repairable, *perpetually rebuildable and upgradable as needed*. I'm not suggesting an ecosocialist society should produce *this particular* "peoples' car." We need something with modern safety features. But to the extent that we would need cars in a sustainable society, we could save immense resources and GHG emissions by producing massively fewer cars and keep them running for decades if not practically forever. Reducing global car production to something like, say 10 percent of current production – *and sharing those* – would not only save vast resources and eliminate massive pollution but also free up labor and resources for other uses, let us shorten the working day – and take longer vacations!



VW ads from the sixties

The same goes for all kinds of industries.

Apple could easily build you iPhones and iMacs, in classic timeless designs that could last for decades, that could be easily be upgraded. This would save mountains of resources not to mention the lives Congolese kids and Foxconn assembly workers. But how much profit is there in that? Apple could never justify such a humane and environmentally rational approach to its shareholders because shareholders (who are several stages removed from the "sourcing" process and don't really care to know about it) are capitalist rationally looking to maximize returns on their portfolios, not to maximize the lifespan of the company's products, let alone the lifespan of Congolese or Chinese. So to this end, you have to be convinced that your G4 phone is not *good enough*, that you "need" an iPhone5 because you need a phone that streams movies, that talks to you and more, and next year you will need an iPhone6. And even if you own an iPad3 you will soon "need" an iPad4, plus an iPad Mini, and how will you live without iTV? This incessant, exponentially growing demand for the latest model of disposable electronic gadgets is destroying societies and the environment from Congo to China and beyond.

Miners near village of Kobu in northeastern Congo

Picture credit: Finbarr O'Reilly/Reuters, in the *New York Times* March 20. 2012.

IKEA could easily manufacture beautifully designed, high quality, sturdy and durable furniture that could last a lifetime, that could be handed down to your children or passed on friends or antique shops for others. That would save a Siberia's worth of trees, lakes of toxic dyes and finishes, and vast quantities of other resources. But why would they do that? IKEA is not in business to make furniture or save the planet. IKEA is in the business to make money. As Ingvar Kamprad, founder and CEO of IKEA, long ago discovered, the way to maximize profits (besides employing semi-slave forced labor in Stalinist regimes and moving his "Swedish" company from high-tax Sweden to low-tax Holland and Switzerland)[33] is to relentlessly cheapen production by, among other tactics, building flat pack disposable particleboard furniture in accordance with the IRON LAW OF MARKETING to sell "the cheapest construction for the briefest interval the buying public will tolerate" so IKEA can chop down more Siberian birch trees and sell you the same shoddy $59 bookcase all over again that will last you as long as the first one did – perhaps a bit longer this time if you don't actually load many books of those flimsy shelves. As an IKEA commercial, directed by Spike Jonze, tells us: "an old lamp (or bookcase or table) doesn't have any feelings; any piece of furniture can and should be replaced at any time." The ad, and the whole IKEA approach, suggests that objects have no lasting meaning or value. They're disposable; when we tire of them, we

[33] Juan O. Tamayo, "STASI records show Cuba deal included IKEA furniture, antiques, rum and guns," *McClatchy Newspapers*, May 9, 2012. James Angelos, "IKEA regrets use of East German prisoners," *Wall Street Journal*, November 16, 2012.

should just throw them out.[34] This is how IKEA got to be the third largest consumer of wood in the world, most of it from East Europe and the Russian Siberia where, according to the World Bank, half of all logging is illegal even by the Russian kleptocracy's standards of legality. IKEA's wholly-owned Swedish subsidiary **Swedwood** has even been condemned by Russian nature conservancy organizations and the Global Forest Coalition for clear-cutting 1,400 acres a year of 200–600 year old old-growth forest near the Finnish border, a process that "is having deep ramifications on invaluable forest ecosystems."[35] This is how IKEA's business plan based on endless "repetitive consumption" is wiping out life on earth. Here again, the capitalist freedom to make such junk wouldn't matter – if it weren't costing the earth.[36]

Siberia's forests on their way via China to an IKEA store near you.

Picture credit: BBC News Online (EIA picture) at http://news.bbc.co.uk/2/hi/8376206.stm

Given capitalism, there's no way to "incentivize" GM to stop producing new cars every year, IKEA to stop making its disposable furniture, Apple to stop pushing you to lose your iPhone 4 and buy a 5. That's what they're invested in. Companies can't change, or change much, because it's too costly, too risky, shareholders won't allow it. And given capitalism, most workers, most of the time, have no choice but to support all this suicidal overconsumption because if we all stop shopping to save the planet today, we'd all be out of work tomorrow. Ask your nearest six-year old what's wrong with this picture.

Capitalism and délastage in the richest country of poor people in the world

Yet even as corporations are plundering the planet to overproduce stuff we don't need, huge social, economic and ecological needs – housing, schools, infrastructure, health care, environmental remediation – go unmet, even in the industrialized world, while most of third world lacks even basic sanitation, clean water, schools, health care, ecological restoration, not to mention jobs.[37] After 300 years of capitalist "development" the gap between rich and poor has never been wider: today, almost half the world, more than 3 billion people, live on less than $2.50 a day, 80% of humanity lives on less than $10 a day. This while the world's richest 1% own 40% of the world's wealth. The richest 10% own 85% of total global assets and half the world barely owns 1% of global wealth. And these gaps have only widened over

[34] I am quoting here from Stephanie Zacharek's excellent "IKEA is as bad as Wal-Mart," *Salon.com*, July 12, 2009: 12:11PM at http://www.salon.com/2009/07/12/cheap/singleton reviewing Ellen Ruppel Shell, *Cheap: The High cost of Discount Culture* (New York: Penguin, 2009), chapter 6.
[35] Ida Karisson, "IKEA products made from 600-year old trees," Inter Press Service, May 29, 2012 Common Dreams.org at https://www.commondreams.org/headline/2012/05/29-1.
[36] Eg. Fred Pearce, "Ikea—you can't build a green reputation with a flatpack DIY manual, *Guardian,* April 2, 2009. Also: Greenpeace, *Slaughtering the Amazon*, July 2009 at http://www.greenpeace.org/international/en/publications/reports/slaughtering-the-amazon/. Alfonso Daniels, "Battling Siberia's devastating illegal logging trade," *BBC news online*, November 27, 2009.
[37] Michael Davis, *Planet of Slums* (London: Verso 2006).

time.[38] Tell me again where Karl Marx was wrong? In Congo, one of the lushest, most fertile countries on the planet, with untold natural wealth in minerals, lumber, tropical crops and more, its resources are plundered every day to support gross overconsumption in the north while poverty, hunger and malnutrition are so widespread that Congo is now listed dead last on the 2011 Global Hunger Index, a measure of malnutrition and child nutrition compiled by the International Food Policy Research Institute. While European and American corporations loot its copper and cobalt and coltran for iPhones and such, *half the population eats only once a day and a quarter less than that.* Things have reached such a state that in places like the capital Kinshasha parents can only afford to feed their children *every other day*. Congolese call it "*délastage*" – an ironic takeoff on the rolling electrical blackouts that routinely hit first one neighborhood then the next. In this context it means "Today we eat! Tomorrow we don't." "On some days," one citizen told a *New York Times* reporter, "some children eat, others do not. On other days, all the children eat, and the adults do not. Or vice versa." [39] This, in the 21st century, in one of the resource-richest countries on earth.

Contraction or collapse

If there's no market mechanism to stop plundering the planet then, again, what alternative is there but to impose an *emergency contraction* on resource consumption? This doesn't mean we would have to de-industrialize and go back to riding horses and living in log cabins. But it does mean that we would have to abandon the "consumer economy" – shut down all kinds of unnecessary, wasteful, and polluting industries from junkfood to cruise ships, disposable Pampers to disposable H&M clothes, disposable IKEA furniture, endless new model cars, phones, electronic games, the lot. Plus all the banking, advertising, junk mail, most retail, etc. We would have completely redesign production to replace "fast junk food" with healthy, nutritious, fresh "slow food," replace "fast fashion" with "slow fashion," bring back mending, alterations, and local tailors and shoe repairmen. We would have to completely redesign production of appliances, electronics, housewares, furniture and so on to be durable and long-lived as possible. Bring back appliance repairmen and such. We would have to abolish the throwaway disposables industries, the packaging and plastic bag industrial complex, bring back refillable bottles and the like. We would have to design and build housing to last for centuries, to be as energy efficient as possible, to be reconfigurable, and shareable. We would have to vastly expand public transportation to curb vehicle use but also build those we do need to last and be shareable like Zipcar or Paris's municipally-owned "Autolib" shared electric cars. *These are the sorts of things we would have to do to if we really want to stop overconsumption and save the world.* All these changes are simple, self-evident, no great technical challenge. They just require a completely different kind of economy, an economy geared to producing what we need while conserving resources for future generations of humans and for other species with which we share this planet.

[38] World Bank Development Indicators 2008, cited in Anup Shah, Poverty and stats, *Global Issues* January 7, 2013 at http://www.globalissues.org/article/26/poverty-facts-and-stats#src1. World Institute for Development Economics Research of the UN cited in James Randerson, "World's richest 1% own 40% of all wealth, UN report discovers," *Guardian*, December 6, 2006. As for trends, in 1979 the richest 1% in the U.S. earned 33.1% more than the bottom 20%. In 2000 the wealthiest 1% made 88.5% more than the poorest 20%. In the Third World, polarization has grown even worse, especially in China which in 1978 had the world's most equal incomes while today, it has the most unequal incomes of any large society. Who says capitalism doesn't work?!

[39] Adam Nossiter, "For Congo children, food today means none tomorrow," *New York Times*, January 3, 2012.

3. If capitalism can't help but destroy the world, then what alternative is there but to nationalize and socialize most of the economy and plan it directly, even plan most of the global industrial economy?

With 7 billion of us humans crowded on one small planet running out of resources, with cities disappearing under vast clouds of pollution, with the glaciers and ice caps melting, and species going extinct by the hour, we desperately need a PLAN to avert ecological collapse. We need a comprehensive *global plan*, a number of *national or regional plans*, and *a multitude of local plans* – and we need to coordinate them all. When climate scientists call on governments to cut CO_2 emissions to stay within a global "carbon budget" if we want to keep a livable planet, isn't that in effect calling for "planning," indeed, planning on a global scale? When governments pump money into research projects like nuclear power or biotech or the internet or clean energy projects, isn't that planning? When scientists say that we need to massively reduce and limit consumption of oil, coal, trees, fish, all kinds of scarce resources, or stop dumping chemicals in the world's oceans – isn't that in effect physical planning and rationing? And don't we want that? Indeed, since we all breathe the same air, live in the same biosphere, don't we really want and need something like a "one-world government" at least on environmental issues? How else can we regulate humanity's collective impact on the global biosphere? How else can we reorganize and reprioritize the economy in the common interest and environmental rationality except in a mostly planned and mostly publicly owned economy?

What would we have to do to save the humans?

If we want a sustainable economy, one that "meets the needs of present generations without compromising the ability of future generations to meet their needs," then we would have to do *at least some or all of the following:*

1. Put the brakes on out-of-control growth in the global North – retrench or shut down unnecessary, resource-hogging, wasteful, polluting industries like fossil fuels, autos, aircraft and airlines, shipping, chemicals, bottled water, processed foods, unnecessary pharmaceuticals, and so on. Abolish luxury goods production, the fashions, jewelry, handbags, mansions, Bentleys, yachts, private jets etc. Abolish the manufacture of disposable, throw away and "repetitive consumption" products. All these consume resources we're running out of, resources which other people on the planet desperately need, and which our children and theirs will need.
2. Discontinue harmful industrial processes like industrial agriculture, industrial fishing, logging, mining and so on.
3. Close down many services – the banking industry, Wall Street, the credit card, retail, PR and advertising "industries" built to underwrite and promote all this overconsumption. I'm sure most of the people working in these so-called industries would rather be doing something else, something useful, creative and interesting and personally rewarding with their lives. They deserve that chance.
4. Abolish the military-surveillance-police state industrial complex, and all its manufactures as this is just a total waste whose only purpose is global domination, terrorism and destruction abroad and repression at home. We can't build decent societies anywhere when so much of social surplus is squandered on such waste.
5. Reorganize, restructure, reprioritize production and build the products we do need to be as durable *and shareable* as possible.
6. Steer investments into things society *does* need like renewable energy, organic

farming, public transportation, public water systems, ecological remediation, public health, quality schools and other currently unmet needs.

7. De-globalize trade to produce what can be produced locally, trade what can't be produced locally, to reduce transportation pollution and revive local producers.
8. Equalize development the world over by shifting resources out of useless and harmful production in the North and into developing the South, building basic infrastructure, sanitation systems, public schools, health care, and so on.
9. Devise a rational approach to eliminate and/or control waste and toxins as much as possible.
10. Provide equivalent jobs for workers displaced by the retrenchment or closure of unnecessary or harmful industries, not just the unemployment line, not just because otherwise, workers cannot support the industrial we and they need to save ourselves.

"Necessary", "unnecessary" and who's the "decider"?

Now we might all agree that we have to cut "overconsumption" to save the humans. But who's to say what's "necessary" and "unnecessary?" How do we decide what to cut? And who's to decide? Under capitalism goods and services are rationed by the market. But that's not sustainable because the market can't restrain consumption, the market can only accelerate consumption. So we need a non-market approach. I don't claim to have all the answers. This is a big question and I'm sure there are others better qualified than me to figure out solutions. But I would think the short answer has to be a combination of *planning, rationing, and democracy.* I don't see why that's so hard. The U.S. government planned significant parts of the U.S. economy during World War II and rationed many goods and services. And we managed just fine. Actually, far from suffering unduly, Americans took pride in conservation and sharing. Besides, what's the alternative? What other choice do we have? There are only so many ways to organize a modern industrial economy.

The challenges of physically planning the world economy in the interests of the 99% instead of for the 1% – reorganizing and reprioritizing the world economy to provide every person sufficient, nutritious, safe and delicious food, providing every human with high quality, pleasurable, and aesthetically appealing housing, consolidating our cities to maximize the feasibility of public transportation, building great schools to enable every student to reach her or his fullest potential, providing top-notch health care for everyone on the planet, reorganizing and reprioritizing work so that everyone can find constructive, enjoyable, interesting, challenging and rewarding work, work that's rewarding in many ways beyond simple remuneration, providing fun, enlightening and inspiring entertainment, reducing the workday so people can actually have time to enjoy themselves and pursue other pleasures, while, not least, how to limit our collective human impact on the planet so as to leave space and resources to all the other wonderful life forms with which we have the pleasure of sharing this unique and amazing planet – all these are no doubt big challenges. They're very big *political* challenges. But they're not an *economic* challenge. This is not Soviet Russia in 1917. I'm not proposing Maoist austerity. Today, there's more than enough wealth and productive capacity to provide every person on earth a *very satisfactory material standard of living*. Even more than half a century ago, Gandhi was right to say then that "there's more than enough wealth for man's need but never enough for some men's greed." I doubt that it would even be much of a *technical* challenge. Google's Larry Page predicts that the virtually everyone in the world will have access to the internet by 2020. Quantifying human needs, global resources, and global agricultural and industrial capacities is, I would think, a fairly pedestrian task for today's computers, with all their algorithms.

Planning can't work?

Right-wing economists like Milton Friedman denied the very possibility of planning any economy, equating all planning with Stalinism. I don't buy that. The question is, planning by whom, for whom? Stalinist central planning was planning from the top down, *by and for* a totalitarian bureaucracy. It completely shut out workers and the rest of society from the planning process. So it's hardly surprising that planning didn't work so well in the USSR. But I don't see what that tells us about the potentials of planning from the bottom up, of democratic planning. Besides, capitalists *indirectly* plan the national and global economies all the time. They meet every year at Davos to shape the world market for their benefit. They conspire to privatize medicine, schools, public transportation, force us to buy "their" water or eat GMO foods. They use the IMF and World Bank to shackle countries with debt, then open them up to U.S. corporate takeover. They've been using their states for centuries to expropriate peasants and tribes, even to exterminate them when necessary as in the Americas, to steal and privatize common lands, break up pre-capitalist societies, re-organize, re-plan whole continents to set up the right "business climate" for capital accumulation. Late developers like Japan and South Korea used their state-backed MITIs and Chaebols to hothouse their own industries, protect them, and strategically plan their integration into the world market. Capitalists are *very good* at planning – for their own interests. So why can't we plan the economy for *our own interests?*

Government "can't pick winners?"

Disengenuous capitalist apologists like the *Wall Street Journal* are quick to condemn any perceived government funded "failures" like the recent bankruptcy of solar startup Solyndra Corporation bankrolled by the Obama administration as proof that "government can't pick winners." But Solyndra didn't fail because solar is a losing technology. It failed because, ironically, capitalist Solyndra could not compete against lower-cost state-owned, state-directed, and state-subsidized competitors in *China*. Besides, since when do capitalists have a crystal ball? CEOs and corporate boards bet on "loser" technologies and products all the time. Look at the recent collapse of electric car startup Fisker Automotive, or Better Place, the Israeli electric vehicle charging/battery swapping stations venture.[40] These join a long list of misplaced private bets from Sony's Betamax to Polaroid, Ford's Edsel, Tucker Autonobilie, DeLorean Motor Company and all the way back to White Star Lines Titanic and the Tulip Mania. CEOs and boards not only pick losing technology and products, they also lose money for their shareholders and even drive perfectly successful companies into bankruptcy every day: Jamie Dimon at JP Morgan, Lehman Brothers, Washington Mutual, Enron, World Com, Pan Am, SwissAir and on and on. Who knows if Facebook or Zipcar or Tesla Motors will ever make money? Government-backed Solyndra lost $500 million. But when Jamie Dimon lost $12 *billion* for JP Morgan, I don't recall the *Journal* howling that capitalists "can't pick winners". When Enron collapsed I don't recall hearing any blanket condemnation of the "inevitable incompetence" of the private sector. Hypocrisy is stock and trade of capitalists, lazy media, and fact averse capitalist economists who want to make the facts fit their simple-minded model no matter the truth. That's why it's entirely in character that the *Wall Street Journal* has never bothered to applaud government when it picked *indisputable winners:* when government-funded, government-directed applied research produced nuclear weapons,

[40] Isabel Kershner, "Israeli venture meant to serve electric cars ending its run," *New York Times,* May 27, 2013. Ronald D. White, "One owner, low miles, will finance: sellers try to unload Fiskers," *Los Angeles Times*, April 26, 2013. Rachel Feintzeig, "Electric-car maker Coda files for bankruptcy*," Wall Street Journal*, May 1, 2013.

nuclear energy, radar, rockets, the jet engine, the transistor, the microchip, the internet, GPS, crucial breakthroughs in biotechnology, when government scientists and government industries launched the Apollo space crafts that put men on the moon, when government-developed and produced ballistic missiles terrorized the Soviets and government-designed and operated bombers bombed the Reds in Korea and Vietnam to "contain communism" and secure American dominance of the Free World for corporate subscribers of the *Wall Street Journal* to exploit -- where then was the *cri de coeur* that "government can't pick winners?" And what about those government-run drones? Anti-government big mouth Rand Paul filibustered for a whole day against the threat of swarms of government drones over American cities but I didn't hear him complain that government drones *don't work.* That wasn't his problem. And when, after an *eight-year long* mind-bogglingly difficult, complex and risky 150 *million-mile* journey, NASA's government-built *Curiosity* space ship landed a (government-built) state of the art science lab the size of a Mini Cooper within a mile and a half of its target on the surface of *Mars*, and then immediately set off to explore its new neighborhood, even the Ayn Rand-loving government-hating Republicans in Congress were awed into silence. As David Sirota's headline in *Salon.com* read on August 13, 2012 just after *Curiosity* set down on the red planet: "Lesson from Mars: Government works!" And right now, as I'm writing this in April 2013, most of a year later, that government-run Mars explorer is happily roving around drilling core samples to find out if there is now or used to be, water and possibly even life on Mars – this while back home, Shell Oil's private capitalist-run arctic drilling platform ran aground in an arctic storm and is now being towed away to Asia for repairs while Shell Oil's shareholders are having second thoughts about their CEO's wisdom in "picking winners" by squandering $5 billion on this fools' errand of drilling for oil under Artic ice.[41]

One planet, one people, one economy for the common good

For better or worse, we are well into what scientists call the "Anthropocene". Nature doesn't run Earth anymore. We do. So if we are, after all, just "one people on one planet," it's time we begin to make conscious *and collective* decisions about how our economic activity affects the natural world – and I don't mean "geo-engineering" the planet by wrapping glaciers in tin foil to slow their melting while capitalism goes right on cooking and pillaging the planet. Since the rise of capitalism 300 years ago, more and more of the world has come to be run on the principle of *market anarchy*, on Adam Smith's maxim that every individual should just maximize his/her own interest – "look out for No. 1" – and the "public interest," the "common good," would take care of itself. Well, that hasn't worked out so well. It was always a dumb theory but it's worked OK for the 1% who could mostly manage without the commons. For the rest of us, the more capitalism, the more the common good gets trashed. And now globalized market anarchy is destroying not just humanity and society – but even life on earth.[42] The problem with Smith's theory is that the aggregate of private interests don't add up to the

[41] Kenneth Chang, "Mars could have supported life long ago, NASA says," *New York Times*, March 12, 2013. And Shell Oil isn't the only company having second thoughts about what it's brilliant CEO thought was a sure thing: Clifford Krauss, "ConocoPhilips suspends its Arctic drilling plans, *New York Times*, April 11, 2013.

[42] Citing a recent study by an international team of researchers in *Nature Climate Change* in May 2013, the BBC reports that if "rapid action" is not taken to curb greenhouse gases, some 34% of animals and 57% of plants will lose more than half of their current habitat ranges. Dr. Rachel Warren, the lead scientist of the study said that "Our research predicts that climate change will greatly reduce the diversity of even very common species found in most parts of the world. This loss of global-scale biodiversity would significantly impoverish the biosphere and the ecosystem services it provides. There will also be a knock-on effect for humans because these species are important for things like water and air purification, flood control, nutrient cycling, and eco-tourism." Matt McGrath, "'Dramatic decline' warning for plants and animals," *BBC News Online*, May 12, 2013 at http://www.bbc.co.uk/news/science-environment-22500673.

public interest. The problems we face with respect to the planetary environment and ecology can't be solved by individual choice in the marketplace. They require *collective democratic control over the economy to prioritize the needs of society, the environment, other species, and future generations*. This *requires local, national and global economic planning to reorganize the world economy and redeploy labor and resources to these ends.* And it requires an economy of *guaranteed full employment* because if we would have to shut down ExxonMobil and GM and Monsanto[43] and Walmart and so on to save the world, then we have to provide equal or better jobs for all those laid off workers because otherwise they won't support what we all need to do to save ourselves.

Ecosocialism and the salvation of small businesses

This does *not at all* mean that we would have to nationalize local restaurants, family farms, farmers markets, artisans, groceries, bakeries, repair shops, workers co-ops and the like. Small-scale self-managed producers based on simple reproduction are not destroying the world. Large-scale capitalist investor-owned corporations based on insatiable accumulation *are* destroying the world. So they would have to be nationalized, many closed down, others scaled back, others repurposed. But an ecosocialist society would rescue and promote small-scale, local self-managed businesses because we would need them, indeed, we would want many more of them whereas, today, capitalism is driving them out of business everywhere.

4. Rational planning requires democracy: voting the big questions

Solar or coal? Frack the planet or work our way off fossil fuels? Drench the world's farms in toxic pesticides or return to organic agriculture. Public transportation or private cars as the mainstay? Let's put the big questions up for a vote. Shouldn't everyone have a say in decisions that affect them all? Isn't that the essential idea of democracy? The problem with capitalism is that the economy isn't up for a vote. But it needs to be. Again, in Adam Smith's day it mattered less, at least for the environment, because private decisions had so little impact on the planet. But today, huge decisions that affect all of us, other species, and even the fate of life on earth, *are all still private decisions,* made by corporate boards on behalf of self-interested investors. Polls show that 57% of Chinese feel that protecting the environment should be given priority, even at the expense of economic growth, and only 21% prioritize the economy over the environment.[44] But, obviously, the Chinese don't get to vote on that or anything else. Polls show Americans opposed to GMO foods outnumber supporters nearly two to one and 82% of Americans favor labeling of GMO foods.[45] But Americans don't get to vote on whether we get GMOs in our food or get told about it. Well, why not? Corporate boards vote to put GMOs and all kinds of toxic chemicals in our food. We're the ones who consume this stuff. We can't avoid GMOs simply by refusing to purchase them – the "market solution" – because they're everywhere, they're in 80% of the foods we consume, and Monsanto and the rest of the GMO industrial complex bribe politicians and regulators with campaign contributions and lucrative revolving-door jobs to make sure you don't know what

[43] On the existential threat Monsanto Corporation poses to humanity and the planet, see the Green Shadow Cabinet: "What must be done about Monsanto corporation, and why." May 23, 2013 at http://greenshadowcabinet.us/statements/ecology-what-must-be-done-about-monsanto-corporation-and-why.

[44] Gallup, June 8, 2012 at http://www.gallup.com/poll/155102/majority-chinese-prioritize-environment-economy.aspx.

[45] *Huffington Post*, "GMO poll finds huge majority say foods should be labeled," March 4, 2013 at http://www.huffingtonpost.com/2013/03/04/gmo-poll_n_2807595.html.

foods to avoid.[46] Well, why should we accept this? Why shouldn't we have a say in these decisions? We don't have to be experts; corporate boards aren't composed of experts. They're mainly comprised of major investors. They discuss and vote on what they want to do, then hire experts to figure out how to implement their decisions. Why can't we do that – for humanity's interests?

Every cook can govern

From Tunisa to Tahir Square, Zacotti Park to Gezi Park, Madison Wisconsin to Kunming Yunnan, Songjian Shanghai, Shifang Sichuan, Guangzhou and thousands of sites and cities and towns all over China, ordinary citizens demonstrate remarkably rational environmental sense against the profit-driven environmental irrationality and irresponsibility of their rulers. [47] In Turkey, "Sultan" Erdogon's decree to tear up Istanbul's last major park to replace it with an Ottoman-style shopping mall provoked mass outrage. Protestors complained, as one put it: "When were we asked what we wanted? We have three times as many mosques as we do schools. Yet they are building new mosques. There are eight shopping malls in the vicinity of Taksim, yet they want to build another… Where are the opera houses? The theatres? The culture and youth centers? What about those? They only choose what will bring them the most profit without considering what we need."[48] When, in a bid to mollify the protestors, a spokesman for the ruling Justice and Development Party (AKP) floated the excellent idea of a public referendum on the issue saying "We might put it to a referendum... In democracies on the will of the people counts" Erdogon considered this option for a moment but when protestors doubted his sincerity, he proved them right by calling in his riot squads to crush the protests instead.[49] In Brazil, on the heels of the Turkish protests, mass protests erupted over announced bus fare hikes but soon morphed into more sweeping social protest as hundreds of thousands of Brazilians turned out in cities across the country to denounce the irresponsible waste of public funds on extravagant soccer stadiums in the run-up to the World Cup in 2014 when schools, public transportation, hospitals, health care and other public services are neglected: "People are going hungry and the government builds stadiums," said Eleuntina Scuilgaro, a pensioner. "I love soccer, but we need schools" said Evaldir Cardoso, a firemen at a protest with his seven-month-old son. "These protests are in favor of common sense", argued protestor Roberta da Matta, "We pay an absurd amount of taxes in Brazil, and now more people are questioning what they are getting in return."[50]

If corporations and capitalist governments can't align production with the common good and ecological rationality, what other choice is there but for society to collectively and democratically organize, plan and manage most production themselves? To do this we would have to establish democratic institutions to plan and manage our social economy. We would have to set up planning boards at local, regional, national/continental and international levels. Those would have to include not just workers, the direct producers, but entire communities, consumers, farmers, peasants, everyone. We have models: the Paris Commune, Russian soviets, Brazil's participatory planning, La Via Campesina, and others. Direct democracy at

[46] See again, Green Shadow Cabinet, "What must be done about Monsanto, and why?" op cit.
[47] Eg. Jennifer Duggan, "Kunming pollution is the tip of rising Chinese environmental activism," *Guardian* blog post May 16, 2013 at 11.59EDT at http://www.guardian.co.uk/environment/chinas-choice/2013/may/16/kunming-pollution-protest-chinese-environmental-activism.
[48] Tim Arango and Ceylan Yeginsu, "Peaceful protest over Istanbul park turns violent as police crack down," *New York Times*, May 31, 2013.
[49] "Turkish government moots referendum on Gezi Park," *Deutsche Welle,* June 12, 2013 at http://www.dw.de/turkish-government-moots-referendum-on-gezi-park/a-16877383.
[50] Simon Romero, "Protests grow as Brazilians blame leaders," *New York Times*, June 19, 2013.

the base, delegated authority with right of recall for higher level planning boards. What's so difficult about that?

As Greg Palast, Jarrold Oppenheim, and Theo MacGregor described in *Democracy and Regulation: How the Public Can Govern Essential Services* (2003), it is a curious and ironic fact that the United States, foremost protagonist of the free market, possesses a large and indispensable sector of the economy that is not governed by the free market but instead, democratically, by public oversight – and that is utilities: the provision of electricity, heating fuel, water and sewerage, and local telephone service. Not only that, but these are the most efficient and cheapest utility systems in the world. The authors note that British residents pay 44 percent more for electricity than do American consumers, 85 percent more for local telephone service and 26 percent more for natural gas. Europeans pay even more, Latin Americans more than Europeans. They write that "Americans pay astonishingly little for high-quality public services, yet low charges do not suppress wages: American utility workers are the nation's industrial elite, with a higher concentration of union membership than in any other private industry." Palast, Oppenheim and MacGregor attribute this to the fact that, unlike Britain and most of the rest of the world, utilities are not unregulated free market corporations like ExxonMobil or Monsanto or Rio Light or British Water. Instead, they are tightly regulated industries, mostly privately owned, but many publicly owned by local municipalities. Yet even when utilities are privately owned like Con Edison in New York or Green Mountain Power in Vermont or Florida Power and Light (to take some east coast examples), it's really hard to call this "capitalism." It's more like state capitalism, even quasi-socialism. Either way, public or investor owned, they are highly regulated, subject to public oversight, involvement and control:

> "Unique in the world (with the exception of Canada), every aspect of US regulation is wide open to the public. There are no secret meetings, no secret documents. Any and all citizens and groups are invited to take part: individuals, industrial customers, government agencies, consumer groups, trade unions, the utility itself, even its competitors. *Everyone affected by the outcome has a right to make their case openly, to ask questions of government and utilities, to read all financial and operating records in detail.* In public forums, with all information open to all citizens, the principles of social dialogue and transparency come to life. It is an extra-ordinary exercise in democracy – and it works... Another little known fact is that, despite the recent experiments with markets in electricity [the authors published this book in 2003, just three years after the Enron privatization debacle], the US holds to the strictest, most elaborate and detailed system of regulation anywhere: private utilities' profits are capped, investments directed or vetoed by public agencies. Privately owned utilities are directed to reduce prices for the poor, fund environmentally friendly physical and financial inspection… Americans, while strongly attached to private property and ownership, demand stern and exacting government control over vital utility services."[51] (Greg Palast, Jerrold Oppenheim, and Theo MacGregor 2003 – emphasis added)

[51] Greg Palast, Jerrold Oppenheim, and Theo MacGregor, *Democracy and Regulation: How the Public can Govern Essential Services* (London: Pluto, 2003) pp. 2-4. The authors point out yet another irony of this system of public regulation, namely that it was created by *private companies* as the lesser evil to fend off the threat of nationalization: "Modern US utility regulation is pretty much the invention of American Telephone & Telegraph Company (AT&T) and the National Electric Light Association (NELA) – the investor-owned telephone and electric industries at the turn of the twentieth century. They saw regulation as protection against Populist and Progressive movements that, since the economic panic of

The authors are careful to note that this is "no regulatory Garden of Eden." It has many failings: regulation is constantly under attack by promoters of market pricing, the public interest and the profit motive of investor-owned utilities often conflict with negative consequences for the public, and so on.[52] But even so, this long-established and indisputably successful example of democratic public regulation of large-scale industries offers us a real-world practical example of something like a "proto-socialism". I see no obvious reason something like this model of democracy and transparency could not be extended, expanded, fully socialized, and replicated to encompass the entire large-scale industrial economy. Of course, as I argued above, to save the humans, we would have to do much more than just "regulate" industries. We would have to completely reorganize and reprioritize the whole economy, indeed the whole global industrial economy. This means not just regulating but retrenching and closing down resource-consuming and polluting industries, shifting resources out of them, starting up new industries, and so on. Those are huge tasks, beyond the scope of even the biggest corporations, even many governments. So who else could do this but self-organized masses of citizens, the whole society acting in concert, democratically? Obviously, many issues can be decided at local levels. Others like closing down the coal industry or repurposing the auto industry, require large scale planning at national if not international levels. Some, like global warming, ocean acidification, deforestation, would require extensive international coordination, virtually global planning. I don't see why that's not doable. We have the UN Climate Convention which meets annually and is charged with regulating GHG emissions. It fails to do so only because it lacks enforcement powers. We need to give it enforcement powers.

1873 and later disruptions, had galvanized anti-corporate farmer and labor organizations. By the turn of the twentieth century, these movements had galvanized considerable public support for governmental ownership of utilities… " p. 98.

[52] In the case of nuclear power plants, local public regulation has often been subverted and overridden by the federal government in its zealous drive to push nuclear power even against the wishes of the local public. Thus in the aftermath of the Three Mile Island nuclear accident in 1979, social scientists Raymond Goldsteen and John Schorr interviewed residents around Three Mile Island about the history of the power plant, why it was built, what voice they had in the decision to build it, and about the decision to restart the plant after the accident. It turns out that, as one resident, a Mrs. Kelsey put it, they had no choice. They were virtually forced to accept it: "They [Met Ed the utility, and the Nuclear Regulatory Commission] keep saying we need this nuclear. They keep pounding that into our heads with the news and everything. We need it. We need it. We can't do without it." Residents told Goldstein and Schorr that the surrounding communities petitioned against restarting the plant after the accident but lost again. Another resident, Mrs. Boswell, said" We don't want to be guinea pigs . . I still think that we should have a say, too, in what goes on. I really do, because we're the victims." Mrs. Brown: "The company just wants [to reopen the plant for] the money …" Mrs. Carmen: "No, they're going to do what they want . . . I don't think [community feelings] would bother them at all." Mrs. Hemmingway: "I feel very angry about it really, because I just feel that there is so much incompetence on the part of the utility, on the part of the NRC, on the part of the local governments…" Residents said that if they had been honestly informed about the risks, and if they had had a choice, they would have investigated other technologies, and chosen differently. Mrs. Hemingway again: "It just seems to me there are so many alternatives we could explore . . . We obviously need alternate energy sources, but solar could provide heating for houses and water [and so on]." Residents said they would have preferred other choices even if it meant giving up certain conveniences: Mrs. Caspar: "I don't really mind conserving all that much. If people can conserve gas [for cars] why can't they conserve energy? Now I don't mean I want to go back to the scrubboard . . . But I don't dry my clothes in the dryer. I hang them . . . on the line. . . and I do try to conserve as far as that goes." (pp. 181-183,212). One of the most interesting results of this study, which is well worth reading in full, is that it illustrates how ordinary citizens, given the chance, would make more rational decisions about technology, safety, and the environment than the "experts" at the utility, Met Ed, and the Nuclear Regulatory Commission. It's not that they were more knowledgeable about the technology than the experts but that the experts were not impartial. They were representing the industry and profits and the NRC, not the public, *so they could not help but systematically make wrong decisions*, decisions that in this case not only violated the public trust and but put huge numbers of lives in danger. Raymond L. Goldsteen and John K. Schorr, *Demanding Democracy After Three Mile Island* (Gainsville: University of Florida Press 1991).

5. Democracy can only work in context of rough socio-economic equality and social guarantees.

When in the midst of the Great Depression, the great "people's jurist" Supreme Court Justice Louis Brandeis said *"*We can either have democracy in this country or we can have great wealth concentrated in the hands of a few, but we can't have both*"* he was more right than he knew. Today we have by far the greatest concentration of wealth in history. So it's hardly surprising that we have the weakest and most corrupt democracies since the Gilded Age. If we want democracy, we would have to abolish "the great wealth concentrated in the hands of the few." That means abolishing not just private property in the means of production, but also extremes of income, exorbitant salaries, great property, and inheritance. Because *the only way to prevent corruption of democracy is to make it impossible to materially gain by doing so* -- by creating a society with neither rich nor poor, a society of basic economic equality.

Does that mean we would all have to dress in blue Mao suits and dine in communal mess halls? Hardly. Lots of studies (Wilkinson and Pickett's *Spirit Level*, the UK's *New Economics Foundation* studies, and others) have shown that people are happier, there's less crime and violence and fewer mental health problems in societies where income differences are small and where concentrated wealth is limited. We don't have five planets to provide the resources for the whole world to live the "American Dream" of endless consumerism. But we have more than enough wealth to provide every human being on the planet with a basic income, with a good job at pay sufficient to lead a dignified life, with safe water and sanitation, quality food, housing, education and healthcare, with public transportation -- all the *authentic* necessities we really need. These should all be guaranteed *as a matter of right*, as indeed most of these were already declared as such in the Universal Declaration of Human Rights of 1948.

Freeing ourselves from the toil of producing unnecessary and/or harmful commodities – *the three quarters of current U.S. production that's a waste* – would free us to shorten the work day, to enjoy the leisure promised but never delivered by capitalism, to *redefine the meaning of the standard of living to connote a way of life that is actually richer, while consuming less,* to realize our fullest human potential instead of wasting our lives in mindless drudgery and shopping. This is the emancipatory promise of ecosocialism.

6. This is crazy, utopian, impossible, never happen

Perhaps. But what's the alternative? The spectre of planet-wide ecological collapse and the collapse of civilization into some kind of Bladerunner dystopia is not as hypothetical as it once seemed. Ask the Chinese. China's "capitalist miracle" has already driven that country off the cliff into headlong ecological collapse that threatens to take the whole planet down with it. With virtually all its rivers and lakes polluted and many depleted, with 70% of its croplands contaminated with heavy metals and other toxins, with undrinkable water, unedible food, unbreathable air that kills more than a million Chinese a year, with "cancer villages" metastasizing over the rural landscape and cancer the leading cause of death in Beijing,[53] China's rulers face hundreds of mass protests, often violent, around the country every day, more than a hundred thousand protest a year, and even with all their police-state instruments of repression, they know they can't keep the lid on forever (indeed, hundreds of thousands of

[53] Edward Wong, "Air pollution linked to 1.2 million premature deaths in China," *New York Times*. April 1, 2013. Johnathan Kaiman, "Inside China's 'cancer villages,'" *Guardian*, June 4, 2012.

Communist Party kleptocrats can see the writing on the wall through the smog and are moving their families, their money and themselves out of the country before it's too late). Today the Chinese and we need a socialist revolution not just to abolish exploitation and alienation, but to derail the capitalist train wreck of ecological collapse before it takes us all over the edge. As China itself demonstrates, revolutions come and go. Economic systems come and go. Capitalism has had a 300 year run. The question is: will humanity stand by and let the world be destroyed to save the profit system?

The spectre of eco-democratic revolution

That outcome depends to a great extent on whether we on the left can answer that question "what's your alternative?" with a compelling and plausible vision of an eco-socialist civilization – and figure out how to get there. We have our work cut out for us. But what gives the growing global eco-socialist movement an edge in this ideological struggle is that capitalism has *no solution to the ecological* crisis*, no way to put the brakes on collapse*, because its only answer to every problem is more of the same growth that's killing us. "History" was supposed to have "ended" with the fall of communism and the triumph of capitalism two decades ago. Yet today, history is very much alive and it is, ironically, capitalism itself which is being challenged more broadly than ever and found wanting for solutions. Today, we are very much living in one of those pivotal world-changing moments in history, indeed it is no exaggeration to say that this is *the* most critical moment in human history. We may be fast approaching the precipice of ecological collapse, but the means to derail this trainwreck are in the making as, around the world, struggles against the destruction of nature, against dams, against pollution, against overdevelopment, against the siting of chemical plants and power plants, against predatory resource extraction, against the imposition of GMOs, against privatization of remaining common lands, water and public services, against capitalist unemployment and precarité are growing and building momentum. Today we're riding a swelling wave of near simultaneous global mass democratic "awakening," almost global mass uprising. This global insurrection is still in its infancy, still unsure of its future, but its radical democratic instincts are, I believe, humanity's last best hope. Let's make history!

Photo: *The Independent*, May 10, 2013.

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