Can we avoid another financial crisis?

Acknowledgements
This book has benefited enormously from the work of the Bank of International Settlements in assembling, for the very first time, comprehensive databases on private and government debt and house prices for the world economy. One of Thomas Kuhn’s many perceptive observations about how an academic discipline1 is shaped by the ruling paradigm of its day is that the discipline will therefore collect data that the paradigm says is relevant, and ignore data that it regards as irrelevant (Kuhn, 1970 #372). This has been the case with the recording of private debt: while national statistical bodies across the globe collect and report detailed data on inflation, unemployment, interest rates and government debt, the recording and reporting of private debt levels is rare, and inconsistent.

The BIS database changes that, which continues a tradition of which the BIS can be proud. The BIS was the only formal economic body to provide any warning of the Global Financial Crisis of 2008 before it happened,2 thanks to the appreciation that its then Research Director Bill White had of Hyman Minsky’s “Financial Instability Hypothesis” (Minsky, 1972 #101; Minsky, 1977 #221), at a time when it was more fashionable in economics to ignore Minsky than to cite him.

Candidates for Endorsement
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Translations
Gael Giraud (French); Caroline (Spanish);

Media reviews
George Monbiot; Larry Elliott; Aditya Chakrabortty; Matt Stoller; Alice Baxter (BBC); Money Science; Michael West (SMH); Karen Tso (CNBC); Izabella Kaminska; Evonomics; Heterodox News; Gillian Tett; Claire Jones (FT); Stephen Long (ABC Aus); Kilkenomics; Carson Scott (Sky Aus); A Evans-Pritchard; Pieria; Martin Wolf; Peter Martin (Fairfax Aus); Simon Rose; Jessica Irvine (SMH Aus); Matthew C. Klein; Michael Janda (ABC Aus); Nassim Khadem (Aus); Vox Day;

From Triumph to Crisis
There was a time when the question this book poses would have generated derisory guffaws from leading economists—and that time was not all that long ago. In December 2003, the Nobel Prize winner Robert Lucas began his Presidential Address to the American Economic Association with the triumphant claim that economic crises like the Great Depression were now impossible:

1 Kuhn refers to sciences rather than disciplines, but I find it difficult to apply the word “science” to economics, given its current state
2 See http://www.bis.org/publ/arpdf/ar2007e.htm.
Macroeconomics was born as a distinct field in the 1940’s, as a part of the intellectual response to the Great Depression. The term then referred to the body of knowledge and expertise that we hoped would prevent the recurrence of that economic disaster. My thesis in this lecture is that macroeconomics in this original sense has succeeded: *Its central problem of depression prevention has been solved, for all practical purposes, and has in fact been solved for many decades.* (Lucas, 2003 #1776, p. 1. Emphasis added.)

Four years later, that claim fell apart, as first the USA and then the global economy entered the deepest and longest crisis since the Great Depression. Almost a decade later, the recovery from that crisis is fragile at best, and non-existent at worst. The question of whether another financial crisis may occur can no longer be glibly dismissed.

That question was first posed decades earlier by the then unknown but now famous maverick American economist Hyman Minsky. In the introduction to Can “It” Happen Again? in 1982, Minsky wrote that “The most significant economic event of the era since World War II is something that has not happened: there has not been a deep and long-lasting depression” (Minsky, 1982 #35, p. ix). Minsky pointed out a profound and sublime truth that, to answer the question of whether another financial crisis is possible:

> it is necessary to have an economic theory which makes great depressions one of the possible states in which our type of capitalist economy can find itself.

Minsky developed such a theory, which he christened the “Financial Instability Hypothesis”, and it led him to conclude that “capitalism is inherently flawed, being prone to booms, crises, and depressions”:

> This instability, in my view, is due to characteristics the financial system must possess if it is to be consistent with full-blown capitalism. Such a financial system will be capable of both generating signals that induce an accelerating desire to invest and of financing that accelerating investment. (Minsky, 1969 #202, p. 224)

Minsky began that article by acknowledging that this was an extreme claim. “Financial crises, domestic and international, have been associated with capitalism throughout its history”, he noted; but these could have been historical accidents. So the fact that they have happened:

> does not prove that they are inherent in capitalism—the crises of history may have been due to a combination of ignorance, human error and avoidable attributes of the financial system. (Minsky, 1969 #202, p. 224)

Minsky argued, on the contrary, that capitalism had an innate tendency to both cycles and crises. His argument focused not on capitalism’s weaknesses, but its strengths: capitalism encourages risk-taking and optimism, which in turn leads to innovation that transforms both production and society itself. This is one of the key reasons why capitalism easily won the contest with socialism during the 20th century: though the Soviets believed that, as Khrushchev put it, “we will bury you”, their “supply

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3 This collection of relatively short papers is by far the best introduction to Minsky’s work. His best book is *John Maynard Keynes*, which despite its name is not a biography, but a thorough analytic statement of the Financial Instability Hypothesis. His final book, *Stabilizing an Unstable Economy*, added little to what can be found in these two earlier works, and lacks their coherence and compelling expression.
constrained” production model was easily outgrown and totally out-innovated by the “demand-constrained” West (Kornai, 1979 #2290; Keen, 1995 #3024).4

However, this innovation and growth generate a milieu of pervasive uncertainty: since the process of innovation itself transforms the future, there is no capacity for a rational anticipation of it. As Keynes put it, “our knowledge of the future is fluctuating, vague and uncertain... there is no scientific basis on which to form any calculable probability whatever. We simply do not know” (Keynes, 1937 #293, p. 214). Given this reality, then as Minsky prosaically put it, “Views as to the future of the world are based upon evaluations of the past” (Minsky, 1969 #202, p. 227). Keynes, rather more evocatively, argued that one of the mechanisms we have adopted to cope with pervasive uncertainty is that:

> We assume that the present is a much more serviceable guide to the future than a candid examination of past experience would show it to have been hitherto. In other words, we largely ignore the prospect of future changes about the actual character of which we know nothing. (Keynes, 1937 #293, p. 214)

This extrapolation of past conditions leads, Minsky argued, to herd behaviour in investment—and Keynes again put it brilliantly: “Knowing that our own individual judgment is worthless, we endeavour to fall back on the judgment of the rest of the world which is perhaps better informed” (Keynes, 1937 #293, p. 214). Consequently, capitalists develop “euphoric expectations” about future prospects as the memory of a previous slump recedes. “It follows”, Minsky asserted, that:

> the fundamental instability of a capitalist economy is upward. The tendency to transform doing well into a speculative investment boom is the basic instability in a capitalist economy. (Minsky, 1977 #221, p. 13)

This instability would simply lead to cycles, as Minsky’s PhD supervisor Schumpeter had argued (Schumpeter, 1934 #329; Schumpeter, 1928 #2491), but not serious breakdowns, were it not for one other inherent feature of capitalism: private debt. In contrast to mainstream macroeconomics, which ignores private debt (Eggertsson, 2012 #4635, pp. 1470-71), Minsky asserted that “debt is an essential characteristic of a capitalist economy” (Minsky, 1977 #221, p. 10), because desired investment in excess of retained earnings is financed by debt (Fama, 2002 #1846; Fama, 1999 #3976; Fama, 1999 #1845). This leads to a cyclical process in capitalism which also causes a secular tendency to accumulate too much private debt over a number of cycles.

Minsky argued therefore that both the cyclical tendencies of the economy and private debt must play a central role in macroeconomics:

> The natural starting place for analyzing the relation between debt and income is to take an economy with a cyclical past that is now doing well. The inherited debt reflects the history of the economy, which includes a period in the not too distant

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4 Kornai rejects the mainstream perspective on capitalism—that it is characterised by limited supply and unlimited wants—and argues cogently that this was instead the situation of the Soviet system. Capitalism is in fact typified by excess capacity, since competitive firms vie for more than their current market share and must have excess capacity, both for growth and to take advantage of problems experienced by their rivals. This in turn makes demand the main constraint on output, and companies that innovate are more likely to secure this demand than those that do not. Kornai convincingly reasons that this led to cyclical but fast growth in the West, and stable but slow growth in the Soviet system. I show that the Soviet growth model, based on “production of the means of production”, enables rapid growth when there are idle resources (in particular, unemployed labour), but hits a ceiling determined by population growth and technical progress once resources are fully employed.
past in which the economy did not do well. Acceptable liability structures are based upon some margin of safety so that expected cash flows, even in periods when the economy is not doing well, will cover contractual debt payments. As the period over which the economy does well lengthens, two things become evident in board rooms. Existing debts are easily validated and units that were heavily in debt prospered; it paid to lever. (Minsky, 1977 #221, p. 10)

A period of tranquil growth thus leads to rising expectations and a tendency to increase leverage: as Minsky put it in his most famous sentence, “Stability—or tranquility—in a world with a cyclical past and capitalist financial institutions is destabilizing.” (Minsky, 1978 #4187, p. 10)

The boom gives way to bust however, because the investment, and the debt taken on to finance it, alter the distribution of income. The boom conditions drive up the wages of workers and prices of raw materials, while the higher debt level increases debt servicing costs as well—especially if market interest rates rise under the pressure to secure finance. The profit expectations that drove the boom are not realised, debt servicing is more problematic than was expected when the debt was taken on, and the boom collapses into a slump as profit falls and investment evaporates.

The cycle then repeats, since the slump reverses the income distribution dynamics that the boom set in train. Falling aggregate demand leads to falling employment and declining wage and materials costs, but at the same time the lower cash flows after the crisis mean that actual debt servicing falls short of what was planned. The recovery from the crisis thus leaves a residue of unpaid debt.

The profit share of output ultimately returns to a level that once again encourages investment, but with a higher level of debt relative to GDP than before. Profits, and capitalist expectations of future profit, have been restored, but with a lower share of income going to workers (and raw material suppliers), offset by a larger share going to bankers.

The next boom therefore sets out with a higher debt level, and the next, and the next, until finally such a level of debt is taken on that declining wages and raw material costs during the slump cannot offset the impact of debt servicing on profits. Without bankruptcy, debt continues to compound forever. With bankruptcy, debt is reduced, but at the cost of a diminished money supply as well. Profits do not recover, investment terminates, and the economy falls into a Great Depression.

Minsky’s theory is compelling, but it was ignored by the economics mainstream when he first developed it, because he refused to make the assumptions they insist upon as being necessary in order to develop “good” economic theory. The most egregious instance of this was Bernanke’s dismissive treatment of Minsky in his Essays on the Great Depression. This book collected the papers on which Bernanke based his claim to be an expert on the Great Depression—and therefore the ideal person to head the Federal Reserve. A dispassionate observer might have expected Bernanke to have considered to all major theories that attempted to explain the Great Depression. Instead, this is the entire consideration that Bernanke gave to Minsky in that book:

Hyman Minsky (1977) and Charles Kindleberger (1978) have in several places argued for the inherent instability of the financial system but in doing so have had to depart from the assumption of rational economic behavior.

[A footnote adds:] I do not deny the possible importance of irrationality in economic life; however it seems that the best research strategy is to push the rationality postulate as far as it will go. (Bernanke, 2000 #1098, p. 43)
Bernanke’s refusal to even consider Minsky’s theory illustrates the real meaning of Milton Friedman’s methodological assertion that “a theory cannot be tested by the “realism” of its “assumptions”” (Friedman, 1953 #1102, p. 41). This is often interpreted as meaning that economists are agnostic about assumptions—“assumptions don’t matter”. But in reality, Friedman’s assertion is used as a smokescreen to avoid criticism of Neoclassical assumptions.

In practice, Neoclassical economists refuse to even discuss a theory if it does not make the assumptions they expect: assumptions about “rational behaviour” that really mean a capacity to accurately predict the future; assumptions that capitalism is dominated by tendencies towards equilibrium, when disequilibrium is both the creative force of capitalism and its Achilles Heel; and, crucially for Minsky, assumptions that money, banks and debt play no significant role in macroeconomics, when a model of capitalism without bankers is as realistic as a model of fish without gills.

Minsky’s theory was also ignored by the mainstream because it lacked one of the essential elements of economic discourse: a mathematical model.

Mathematical economic models have a poor reputation with the public, and deservedly so, given how mathematics has been abused by mainstream economists.5 But they were and remain essential ingredients for discourse amongst economists. I decided to fill that void in Minsky’s repertoire by producing a mathematical model of his hypothesis in my PhD. That model put into mathematical form the verbal model that I have outlined above. But it also had a remarkable characteristic that Minsky had not anticipated, and which turned out to be extremely prescient.

Macroeconomics and Complexity

Since 1976, Lucas has replaced Friedman at the pinnacle of Neoclassical methodology, with the assertion that good macroeconomic theory could only be developed from microeconomic foundations. Arguing that “the structure of an econometric model consists of optimal decision rules of economic agents” (Lucas, 1976 #1985, p. 13), Lucas asserted that to be valid, a macroeconomic model had to be derived from the microeconomic theory of the behaviour of utility-maximizing consumers and profit-maximizing firms. Looking back on his career in his Presidential Address to the American Economic Association in 2003, Lucas said that as a young student “I also held on to Patinkin’s ambition somehow, that the theory ought to be microeconomically founded, unified with price theory”:

Nobody was satisfied with IS-LM as the end of macroeconomic theorizing. The idea was we were going to tie it together with microeconomics and that was the job of our generation. (Lucas, 2004 #1775, p. 20)

In fact, Lucas’s methodological precept—that macro level phenomena must be derived from micro-level foundations—had been invalidated long before he made it, by mathematical economists who had posed the question of whether what microeconomic theory predicted about the behaviour of a single consumer aggregated, not even to the level of macroeconomics, but merely to the level of a

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5 Mainstream economists like Lucas have abused mathematics rather than used it, to confirm pre-conceived biases rather than analyse the world objectively. They also routinely ignore or distort mathematical results that they do not like. Their actual behaviour is so far removed from how mathematics should be undertaken that I have coined the term “mythematics” to distinguish what they do from proper mathematical work (Keen, 2015 #5172, p. 246).
single market (Gorman, 1953 #1491; Sonnenschein, 1972 #1484; Sonnenschein, 1973 #1486). They concluded—reluctantly—that it did not:

market demand functions need not satisfy in any way the classical restrictions which characterize consumer demand functions... The importance of the above results is clear: strong restrictions are needed in order to justify the hypothesis that a market demand function has the characteristics of a consumer demand function. Only in special cases can an economy be expected to act as an ‘idealized consumer’. The utility hypothesis tells us nothing about market demand unless it is augmented by additional requirements.’ (Shafer, 1993 #349, p. 671-72)

Economics students today still spend an inordinate amount of time learning how to derive a demand curve for an individual consumer from assumptions about how a rational consumer behaves, and this individual demand curve so derived necessarily obeys the so-called “Law of Demand”, that demand increases as the price of the good falls. A similar downward-sloping curve is then used to represent market demand, where that must consist of demand from more than one consumer, in the context of an economy with more than one good—otherwise the whole concept of relative price, on which Neoclassical microeconomics is based, does not make sense.

But as long ago as 1953 (Gorman, 1953 #1491), mathematical economists had proven that, if you took two or more consumers with different tastes, consuming two or more goods whose relative consumption levels changed as incomes changed (because some were necessities, and others were luxuries—think toilet paper and chocolate), then the resulting market demand curve could have almost any shape at all—it didn’t have to slope downwards.

This doesn’t mean that demand for an actual commodity in an actual economy will fall if its price falls, rather than rise. It just means that mainstream economic theory, which makes such a song and dance about market price being determined by the intersection of (upward-sloping) market supply with (downward-sloping) market demand curves, doesn’t have an explanation for why they do. Instead, the empirical regularity that demand for most goods rises most of the time when their prices fall, must be due to features that the model of a single consumer’s behaviour omits—and the obvious candidate for the key missing feature is the distribution of income between consumers, which will change when prices change.

For the purposes of building a macroeconomic model, this means that even if the Neoclassical theory of individual behaviour was valid (which it is not), any information it gave you about how individuals behaved would not survive aggregation, even to level of a single market. Instead the relationship between individuals—and in particular the distribution of income—was more important than the behaviour of individuals in determining market and macroeconomic phenomena.

This is a commonplace conclusion in genuine sciences today: it’s known as the “emergence” issue in complex systems (Nicolis, 1971 #1842; Ramos-Martin, 2003 #4313). The dominant characteristics of a complex system come from the interactions between its entities, rather than from the properties of a single entity considered in isolation.

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6 The only limitation was that the shape had to be fitted by a polynomial—the sum of powers of $x$, $x^2$, $x^3$, and so on: “every polynomial ... is an excess demand function for a specified commodity in some $n$ commodity economy” (Sonnenschein, 1972 #1484, p. 550).

7 See (Sippel, 1997 #290) and Chapter 3 of (Keen, 2011 #2701).
My favourite instance of it is the behaviour of water. If Lucas’s methodological “rule” were true—that one could, and in fact, one had to derive macroscopic behaviour from microscopic principles—then meteorologists would have to derive the myriad properties of water from the characteristics of single molecule of H2O. This would entail showing how, under appropriate conditions, a “water molecule” could become an “ice molecule”, a “steam molecule”, or—my personal favourite—a “snowflake molecule”. In fact, the wonderful properties of water occur, not because of the properties of isolated H2O molecules themselves, but because of interactions between lots of (identical) H2O molecules.

The fallacy in the belief that higher level phenomena (like macroeconomics) had to or even could be derived from lower level phenomena (like microeconomics) was pointed out clearly in 1972—again, before Lucas wrote—by the Physics Nobel Laureate Philip Anderson:

> The main fallacy in this kind of thinking is that the reductionist hypothesis does not by any means imply a “constructionist” one: The ability to reduce everything to simple fundamental laws does not imply the ability to start from those laws and reconstruct the universe. In fact, the more the elementary particle physicists tell us about the nature of the fundamental laws the less relevance they seem to have to the very real problems of the rest of science, much less to those of society. (Anderson, 1972 #1837, p. 393)

Since economists confirmed this insight in the case of economics in the so-called “Sonnenschein-Mantel-Debreu Theorem”, this should have led to economics abandoning its fetish for constructionism (as Anderson termed it), in much the same way that Pythagoreans reluctantly but productively abandoned their belief that all numbers were rational when one of their number proved this was false. But instead Neoclassical economists continue to insist of Lucas’s flawed methodology, and either invent absurd contrivances to circumvent the problem, or ignore it completely and soldier on regardless.

However, the fact that Lucas’s methodological rule is false does not mean that a methodological free-for-all should apply. The approach of complex systems theorists is to work from the structure of the system they are analysing, since they believe that this structure, properly laid out, will contain the interactions between the entities in the system that give it its dynamic characteristics.

This was the manner in which the first complex systems models of physical phenomena were derived: the so-called “many body problem” in astrophysics, and the problem of turbulence in fluid flow.

Newton’s equation for gravitational attraction explained how a predictable elliptical orbit results from the gravitational attraction of the Sun and a single planet, but it could not be generalised to explain the dynamics of the multi-planet system in which we actually live. Working from the realisation that planets in such a system would have to pass through a given plane in 3-dimensional space, the great French mathematician Henri Poincare discovered in 1899 that the orbits would be what we now call “chaotic”: even with a set of equations to describe their motion, accurate prediction of their future motion would require infinite precision of measurement of their positions and velocities today. As astrophysicist Scott Tremaine put it, since infinite accuracy of measurement is impossible, then:

> for practical purposes the positions of the planets are unpredictable further than about a hundred million years in the future because of their extreme sensitivity to initial conditions. As an example, shifting your pencil from one side of your
desk to the other today could change the gravitational forces on Jupiter enough to shift its position from one side of the Sun to the other a billion years from now. The unpredictability of the solar system over very long times is of course ironic since this was the prototypical system that inspired Laplacian determinism. {Tremaine, 2011 #5173}

However, long term unpredictability does not mean either a total lack of predictability, or a lack of structure. You almost surely know of the phrase “the butterfly effect”, the saying that a butterfly flapping or not flapping its wings in Brazil can make the difference between the occurrence or not of a hurricane in China. The butterfly metaphor was inspired by the dynamics of the complex systems weather model developed by Edward Lorenz (Lorenz, 1963 #4825), which look like the wings of a butterfly—see Figure 1.

*Figure 1: Lorenz’s ”Butterfly” weather model*

The saying does not mean that butterflies cause hurricanes, but rather that imperceptible differences in initial conditions can make it essentially impossible to predict the path of complex systems like the weather after a relatively short period of time. Though this eliminates the capacity to make truly long term weather forecasts, the capacity to forecast for a finite but still significant period of time is the basis of the success of modern meteorology. The failure of economics to develop anything like the same capacity is partly because the economy is far less predictable than the weather, given human agency, as Hayekian economists justifiably argue. But it is also due to the
insistence of mainstream economists on outmoded and indeed false modelling techniques, when well-founded complex systems approaches have been available now for half a century.

My model of Minsky’s Financial Instability Hypothesis is based on this now well-established complex systems tradition of building a model from a strictly true foundation, and of not mechanically assuming that equilibrium will apply. I started with the non-monetary cyclical growth model developed by the great but neglected American economist Richard Goodwin (Goodwin, 1967 #279), which was based on two definitions—the wages share of output (wages divided by GDP), and the employment rate (employment divided by population)—and which had two social classes in it (workers and capitalists). Goodwin had simple linear relationships between capital and output, output and employment, and the employment rate and workers’ wage demands—the classic linear “Phillips Curve”. The model generated cycles in income distribution and the employment rate that were regular and repeated forever—see Figure 2.

Figure 2: Goodwin’s non-monetary growth cycle model

Following Minsky’s insistence that private debt was a fundamental aspect of capitalism, I added one more definition—the ratio of private debt to GDP—and one more social class: bankers. To turn these definitions into a model, I added an investment function describing capitalists’ reaction to the rate of profit. For a low rate of profit, capitalists would invest less than profits (and use the difference to pay

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8 Though Phillips insisted that the relationship was nonlinear, and he proposed that the rate of change of employment and the rate of inflation should also be arguments to the function (Phillips, 1957 #2143;Phillips, 1958 #2144). I used a nonlinear function in my 1995 paper.
off debt); for a high rate of profit, they would invest more than profits and borrow from banks to make up the difference.

To test Minsky’s assertion that crises were an inevitable facet of capitalism, I omitted all the additional characteristics that Minsky and others had proposed as reform-able causes of crises: fraud, “bankers behaving badly” (in my model, bankers simply responded to capitalist investment desires), Ponzi financing (all borrowing was for productive investment), and erroneous government policy (my basic model omitted a government sector completely).9

The model generated two feasible outcomes, with the only difference between the two being simply how willing my hypothetical capitalists were to invest. A lower level of willingness, which represented less adventurous capitalists, led to equilibrium. A higher level, representing more adventurous capitalists, led to crisis.

With less adventurous capitalists, the system stabilised: the debt ratio rose from zero to a constant level, while cycles in the employment rate and wages share gradually converged on equilibrium values—see Figure 3.

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9 A government sector was modelled later in the paper—and again it generated both expected and unexpected results. The economy could be stabilised in that it avoided a Great Depression, but it could also generate permanent cycles as well.
With more adventurous capitalists came the outcome that Minsky’s thesis predicted: a Great Depression, caused by a level of private debt to GDP that continued to rise over time, while employment and the wages share of output went to zero (and profit went strongly negative). That much I expected. The surprise was that this disastrous outcome was preceded by a period of apparent improving economic tranquility that superficially looked the same as the transition to equilibrium in the good outcome—see Figure 4.\textsuperscript{10}

\textsuperscript{10} My model used the wages share of output, which as I show later is a proxy for inflation. The basic pattern of diminishing and then rising cycles occurs with linear as well as nonlinear function; the simulations show here, and in my 1995, used nonlinear behavioural functions for both workers (the Phillips Curve) and capitalists (investment as a function of the rate of profit).
Figure 4: My Minsky model with more optimistic capitalists

Unstable

Therefore, if your economic model advised you to ignore the level of private debt—as Neoclassical economics does—and if you focused simply on the level of employment and the rate of inflation—as Neoclassical economists did before the Global Financial Crisis, and largely still do afterwards—you would not see this crisis coming. From the point of view of employment and inflation, there was no qualitative difference between the two outcomes before the crisis itself occurred (see Figure 5).
Therefore, as Minsky had surmised, a crisis could occur in capitalism even if it was devoid of the many questionable and downright illicit practices that clearly exist in the real world, but which could arguably be reformed or legislated away. But that crisis contained an unexpected sting: the lead-up to it would look like a convergence to equilibrium, unless you paid attention to the level of private debt (see Figure 6).
My mathematical model thus vindicated Minsky's verbal one, and I could have finished on that note. However, the unexpected phenomenon of an apparent convergence to equilibrium before the crisis was so striking that, writing in August 1992, I decided to finish my paper with what I thought was a nice rhetorical flourish:

The chaotic dynamics explored in this paper should warn us against accepting a period of relative tranquility in a capitalist economy as anything other than a lull before the storm. (Keen, 1995 #132, p. 634)

Though my model did predict that this phenomenon of declining cycles in employment and inflation would precede a crisis if one were to occur, I didn’t expect my rhetorical flourish to manifest itself in subsequent economic data. There were, I thought, too many differences between my simple, private-sector-only model and the complicated (as well as complex) real world for this to happen.

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11 There was a 3-year lag between submitting the paper to a journal and its publication.
12 The Wages share of output was a proxy for inflation in this simple model without price dynamics. The more complex model used later in this book explicitly includes inflation and shows the same trend for inflation as found in the data.
13 My model with a government sector showed that a government that resolutely targeted a maximum level of unemployment could prevent a debt-deflation from occurring, by allowing government deficits to counterbalance cyclical private sector downturns (Keen, 1995 #132, pp. 629-32)—but of course real world
But it did.

The Lull and The Storm
At the time that I developed my Minsky model, the global economy was still mired in the recession that, later that year, would hand the keys to the White House to Bill Clinton, on the back of the slogan “It’s The Economy, Stupid”. Unemployment had just peaked at 7.8 percent—a substantial level compared to the post-WWII average of 5.6%, but nowhere near as severe as the 1983 recession, when it hit 10.8 percent. From August 1992 on, unemployment trended down as the US economy embarked on first the Telecommunications Boom and then the DotCom Bubble of the 1990s. Inflation had fallen sharply from the elevated levels of the late 1970s, but as this new boom took hold, there were fears that inflation would take off once more.

It didn’t: inflation trended down as unemployment fell, dropping from 3 percent at the height of the 1990s recession to 1.5 percent per annum in the late 1990s.

Figure 7: The three key indicators in my model of Minsky’s Financial Instability Hypothesis for the USA from 1980

When the DotCom Bubble ended in with the collapse of the Nasdaq index in 2000, the ensuing downturn turned out to be mild. Unemployment peaked at just 6.3 percent in mid-2003, and governments have been anything but resolute about doing that, and have instead obsessed about running government surpluses at all times.
inflation fell to just over 1 percent. Even before the downturn hit its nadir, mainstream Neoclassical economists had spotted a trend that, from their point of view, was clearly a positive one: the “Great Moderation” (Stock, 2002 #5176). Ben Bernanke was a special fan of this phenomenon, and championed the view that Federal Reserve inflation-fighting policy was the primary cause of this “welcome change in the economy”:

As it turned out, the low-inflation era of the past two decades has seen not only significant improvements in economic growth and productivity but also a marked reduction in economic volatility, both in the United States and abroad, a phenomenon that has been dubbed "the Great Moderation." Recessions have become less frequent and milder, and quarter-to-quarter volatility in output and employment has declined significantly as well. The sources of the Great Moderation remain somewhat controversial, but as I have argued elsewhere, there is evidence for the view that improved control of inflation has contributed in important measure to this welcome change in the economy. {Bernanke, 2004 #287}

In contrast to the orgy of self-congratulation in mainstream economics, alarms were being sounded by non-mainstream economists—and in particular by the English economist Wynne Godley (Godley, 1998 #1267;Godley, 2000 #1268;Godley, 2001 #1256;Godley, 2002 #1280;Godley, 2004 #1257;Godley, 2005 #1253). Godley, who had developed a method of analysing the economy using inter-sectoral monetary flows, was convinced from 1998 on that the US economy was on an unsustainable path. Writing with Randall Wray and others, Godley applied the truism that one sector’s monetary surplus must be matched by an identical deficit in other sectors, to argue that the trend towards a US government surplus at the time required an unsustainable rise in private sector indebtedness.

In the provocatively titled “Is Goldilocks Doomed?” (Godley, 2000 #1268), Godley and Wray asserted forcefully that at some point, the private sector (specifically households and non-financial sector firms) would have to stop borrowing, and when they did, the long-running economic boom in the USA would give way to a severe recession:

Since the end of 1991, private expenditure has persistently risen more than income; indeed, the private sector deficits of the past three years are entirely unlike anything that has ever happened before. Today, the private sector deficit is 5.3 percent of GDP, with the general government surplus being equal to 2.2 percent of GDP and the balance of payments deficit being equal to 3.1 percent of GDP (the sum of these, of course, equals the private sector deficit, which is 5.3 percent of GDP). Before 1992, private sector deficits were rare, never persisted for more than 18 months, and never exceeded much more than 1 percent of GDP. We are thus in uncharted territory, with a private sector deficit that is five times greater than anything achieved in the past (relative to GDP) and that has already persisted for twice as long as any past deficits.

If we take the CBO’s [Congressional Budget Office] projections regarding GDP growth rates and continued (indeed, growing) government budget surpluses, and then make reasonable assumptions about continued deterioration of the U.S. trade account, this implies that the private sector deficit must continue to worsen... continued economic expansion in the presence of unprecedented fiscal restriction is possible only if the private sector continues to increase spending
much faster than its income grows. The balance sheet implication is that private sector borrowing must also grow to the point that the ratio of private debt to disposable income increases to 2.4—from a ratio of 1.6 reached at the end of 1998 (which was already a record).

We hasten to add that we do not believe this projection. The economy will not continue to grow; the projected budget surpluses will not be achieved; private sector spending will not continue to outstrip income; and growth of private sector indebtedness will not accelerate... As soon as private sector spending stops growing faster than private sector income, GDP will stop growing. {Godley, 2000 #1268, p. 204}

Godley’s warnings in this and several other equally provocative papers were ignored by the mainstream, for several reasons. The most important was that Godley did not make the assumptions the mainstream required: his papers discussed inter-sectoral monetary and credit flows, not the optimising behaviour of rational agents. His analysis was also strictly in terms of money stocks and flows, when the mainstream had long ago convinced itself that the macroeconomy could and indeed should be modelled as if money, banks and debt did not exist. As Krugman and Eggertsson conceded after the crisis, the vast majority of mainstream economic models ignored private debt completely:

Given the prominence of debt in popular discussion of our current economic difficulties and the long tradition of invoking debt as a key factor in major economic contractions, one might have expected debt to be at the heart of most mainstream macroeconomic models—especially the analysis of monetary and fiscal policy. Perhaps somewhat surprisingly, however, it is quite common to abstract altogether from this feature of the economy. {Eggertsson, 2012 #4635, pp. 1470-71}

Crucially, the mainstream could not see why the aggregate level of debt, or changes in its rate of growth, should have any macroeconomic significance. Insofar as they had models of credit, these portrayed lending as a transfer of spending power from one agent to another, not as a means by which additional spending power was created—or when debts were repaid, destroyed. To the mainstream, the level and rate of change of private debt could only matter if there were extreme differences in the behaviour and/or circumstances of debtors and creditors. For this reason, Ben Bernanke dismissed Irving Fisher’s argument that a debt-deflationary process caused the Great Depression:

The idea of debt-deflation goes back to Irving Fisher (1933). Fisher envisioned a dynamic process in which falling asset and commodity prices created pressure on nominal debtors, forcing them into distress sales of assets, which in turn led to further price declines and financial difficulties. His diagnosis led him to urge President Roosevelt to subordinate exchange-rate considerations to the need for reflation, advice that (ultimately) FDR followed.

Fisher’s idea was less influential in academic circles, though, because of the counterargument that debt-deflation represented no more than a redistribution from one group (debtors) to another (creditors). Absent implausibly large
differences in marginal spending propensities among the groups, it was suggested, pure redistributions should have no significant macro-economic effects.\(^{14}\) (Bernanke, 2000 \#1098, p. 24)

Even after the crisis, mainstream economists still reject out of hand arguments that the aggregate level and rate of change of debt matters. In 2013, Krugman dismissed Richard Koo’s argument that the Japanese economy is balance-sheet constrained, on the basis that for every debtor whose spending is constrained by debt, there must be a creditor whose spending is enhanced by it:

Maybe part of the problem is that Koo envisages an economy in which everyone is balance-sheet constrained, as opposed to one in which lots of people are balance-sheet constrained. I’d say that his vision makes no sense: where there are debtors, there must also be creditors, so there have to be at least some people who can respond to lower real interest rates even in a balance-sheet recession. (Krugman, 2013 \#5151)

The final reason why Godley’s warnings were not heeded is that his papers were not even read by the mainstream. With their dismissive attitude to papers that did not make the assumptions they required, and their \textit{a priori} grounds for rejecting any argument that private sector indebtedness mattered, Godley’s papers could not get published in mainstream economic journals like the \textit{American Economic Review} or the \textit{Economic Journal}. Instead, they turned up in contrarian journals like \textit{Challenge} (Godley, 1998 \#1267; Godley, 2002 \#1280) and the \textit{Journal of Economic Issues} (Godley, 2000 \#1268), or obscure outlets like the \textit{Banca Nazionale del Lavoro Quarterly Review} (Godley, 2001 \#1256). Mainstream economists did not even know that these journals existed, let alone read them.

I was a relatively late recruit to the tiny band of economists who sounded an alarm about an impending crisis \cite{Bezemer,2009;Bezemer,2010;Bezemer,2011} as the mainstream passed around the champagne on the bridge of the good ship Titanic.\(^{15}\) I did not make my first warnings of an impending crisis until December 2005, and I made them exclusively in the media and on blogs rather than the academic literature.

The choice of blogs and the media was deliberate: I knew that my analysis would never get past the Neoclassical gatekeepers on mainstream journals, so that, like Godley before me, my academic warnings of crisis would have been made in the wilderness of non-mainstream journals only. But journalists were far more open to contrarian arguments, and I knew how to get my views into print and onto the airwaves.\(^{16}\) The Internet also made it possible for anyone to at least put their views in the public arena, in a manner that had never been possible before.

The reasons for my late start as a Cassandra were largely circumstantial, since from at least 2000, the trends in the data had clearly started to match the behaviour of my simple Minsky model. The

\(^{14}\) Even on its own grounds, this is an inane statement. To regard a debt-deflation as “no more than a redistribution from one group (debtors) to another group (creditors)” ignores the obvious fact that, in a debt-deflation, many debtors go bankrupt and do not in fact repay their creditors.

\(^{15}\) Bezemer notes 12 economists who both warned of the crisis and had an explanation of it that went beyond worrying about the US housing bubble.

\(^{16}\) My pre-academic career included stints in part-time journalism, as economic commentator on the \textit{Australian Broadcasting Commission} radio program \textit{Indian Pacific}, and as software editor for the monthly computing magazines \textit{Australian Computing} and \textit{Your Computer}. I also ran seminars on international journalism between Chinese and Australian journalists in 1981/82, and Australian and Southeast Asian journalists in 1983.
decline in the level and volatility of unemployment and inflation was obvious, as was the crucial indicator of an increasing ratio of private debt to GDP (see Figure 7).

But from 1999 on, I was fully occupied with writing my book Debunking Economics (Keen, 2001 #129). The decision to write the book was partly motivated by the belief that a crisis was imminent, but the effort of researching the voluminous critical literature on Neoclassical economics—from its facile microeconomic foundations through to the sophistry of the Efficient Markets Hypothesis—meant that I took my eye off the empirical data on private debt.

After the book was published, I became embroiled—as I expected—in a furious conflict with Neoclassicals over chapter four in the book, which presented a new critique of the textbook model of perfect competition (Keen, 2003 #1216; Keen, 2003 #3020; Lee, 2004 #138; Standish, 2004 #3009; Keen, 2005 #144; Keen, 2010 #1497). When that debate was largely over in late 2005, I resolved to work on turning my PhD on Minsky (Keen, 1998 #5177) into a book. But that task was waylaid by a request from an Australian legal aid body to be an expert witness in a case on predatory lending (Keen, 2005 #3333).

While preparing that case, I used the throwaway line that “private debt to GDP ratios have been increasing exponentially in recent years”, and then realised that, as an expert witness, I couldn’t rely on mere hyperbole. I would need to check the data—something I hadn’t done in any systematic way since early 1992. I expected that I would be forced to revise “exponential” to something less dramatic.

Then, at about 2am on a mid-December evening in Perth, Australia, I plotted the Australian private debt to GDP data—and my jaw hit the floor. Describing the trend as exponential was no hyperbole: the correlation of the Australian private debt to GDP ratio from 1976 till 2016 with a simple exponential function was a staggering 0.98. The only thing preventing it from being a pure exponential trend was a hyper-exponential bubble from 1985 until 1992. Surely this trend could not continue, and when it ended, there would be a severe recession.

But was this merely an Australian phenomenon, or was it a global one? Data on private debt was very hard to collect—many countries didn’t record it, and there was no centralised database like there was for employment with the ILO. So the next best thing to a global survey was to check the state of the world’s biggest economy, the USA, where fortunately data on private debt had been systematically collected by the Federal Reserve since 1952 (Copeland, 1951 #4158).

Ignoring the hour, I repeated the same exercise for the USA, which entailed first downloading private debt data from the Federal Reserve, and GDP data from the Bureau of Economic Activity. The US debt data went back much further than the Australian, and while the trend was less clearly exponential, it still fitted a simple exponential function with a correlation coefficient of over 0.97.

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17 I was in Perth because my then wife was performing there in the stage show Dirty Dancing, and I was working late because I had misread my brief, and found that I had one week less than I had thought to submit my report to the court.

18 This deficiency has recently been remedied by the Bank of International Settlements, which now publishes a database on credit to the non-financial sectors of the economy (households, firms and the government) with data on over 40 countries. See http://www.bis.org/statistics/totcredit/totcredit.xlsx.
I was now convinced that a global economic crisis was approaching, and I knew that it would take mainstream economists completely by surprise, since they paid no attention to either private debt or disequilibrium dynamics in their economic models. Since politicians relied upon mainstream economists for guidance about managing the economy—on the touching but totally false belief that mainstream economists are experts on the economy—it was clear that the global economy was about to walk blindfolded into the greatest economic crisis in the post-WWII era.

Someone had to warn about this impending crisis, and at least in Australia, that someone was me.

My working hypothesis—which I refined and expanded over subsequent years—was that aggregate expenditure in the economy was the sum of GDP plus credit, and that this sum generated both incomes (through purchases of goods and services) and realised capital gains (via net purchases of assets—predominantly property and shares). Since credit (which is fundamentally equivalent to the growth in private debt) was both far more volatile than GDP, and also capable of turning negative (and thus subtracting from demand), I argued that the crisis would commence when the rate of growth of private debt slowed down:

So how do I justify the stance of a Cassandra? Because things can’t continue as normal, when normal involves an unsustainable trend in debt. At some point,
there has to be a break—though timing when that break will occur is next to impossible, especially so when it depends in part on individual decisions to borrow... At some point, the debt to GDP ratio must stabilise—and on past trends, it won’t stop simply at stabilising. When that inevitable reversal of the unsustainable occurs, we will have a recession. (Keen 2007, “Debtwatch May 2007: Booming on Borrowed Money”, http://www.debtdeflation.com/blogs/2007/04/30/debtwatch-may-2005-booming-on-borrowed-money/)

The crisis duly began in on August 9th 2007, when the French bank BNP shocked global financial markets by declaring that it would no longer operate three of its funds that were linked to the US sub-prime mortgage market, due to the “complete evaporation of liquidity”.

Mainstream economists were of course worse than useless in anticipating this crisis (with the honourable exceptions of Robert Shiller, Nouriel Roubini & Dean Baker). Far from warning the public and politicians that the greatest crisis since the 1930s was about to occur, mainstream economists—especially those whose advice was based on “Dynamic Stochastic General Equilibrium” mathematical models—assured the world that 2008 was going to be a cracker of a year. The two most egregious examples of many came from the OECD immediately before the crisis began, and the Federal Reserve soon afterwards. The OECD, in its biannual Economic Outlook, opined in June of 2007 that “the current economic situation is in many ways better than what we have experienced in years”:

In its Economic Outlook last Autumn, the OECD took the view that the US slowdown was not heralding a period of worldwide economic weakness, unlike, for instance, in 2001. Rather, a “smooth” rebalancing was to be expected, with Europe taking over the baton from the United States in driving OECD growth.

Recent developments have broadly confirmed this prognosis. Indeed, the current economic situation is in many ways better than what we have experienced in years. Against that background, we have stuck to the rebalancing scenario. Our central forecast remains indeed quite benign: a soft landing in the United States, a strong and sustained recovery in Europe, a solid trajectory in Japan and buoyant activity in China and India. In line with recent trends, sustained growth in OECD economies would be underpinned by strong job creation and falling unemployment. {Cotis, 2007 #2062, p. 7 Emphasis added}

Three months after the crisis began, and just weeks before the now officially-recorded start of the Great Recession, the Federal Reserve’s modelling team jocularly informed the Federal Reserve Open Market Committee that it also expected 2008 to be a tranquil year:

Overall, our forecast could admittedly be read as still painting a pretty benign picture: despite all the financial turmoil, the economy avoids recession and, even with steeply higher prices for food and energy and a lower exchange value of the dollar, we achieve some modest edging-off of inflation.

So I tried not to take it personally when I received a notice the other day that the Board had approved more-frequent drug-testing for certain members of the senior staff, myself included. [Laughter]
I can assure you, however, that the staff is not going to fall back on the increasingly popular celebrity excuse that we were under the influence of mind-altering chemicals and thus should not be held responsible for this forecast.

No, we came up with this projection unimpaired and on nothing stronger than many late nights of diet Pepsi and vending-machine Twinkies. {Committee, 2007 #5179}

This hilarity rapidly gave way to panic as the true magnitude of the crisis sank in. As then Treasury Secretary Hank Paulson put it in his memoir On the Brink, by late-2008 officials in the US administration came to believe that, without decisive action by the government, the end of capitalism was nigh:

“We need to buy hundreds of billions of assets”, I said. I knew better than to utter the word trillion. That would have caused cardiac arrest. “We need an announcement tonight to calm the market, and legislation next week,” I said.

What would happen if we didn’t get the authorities we sought, I was asked. “May God help us all,” I replied. {Paulson, 2010 #1177, p. 261}

The US crisis had begun when my Minskian analysis indicated that it would—when the rate of growth of private debt began to slow down, and did not recover. Private debt, which had grown by a peak level of $2 trillion a year in 2006 and 2007, plunged by almost $1 trillion a year by the beginning of 2010.
And the economy went down with it. The crash in credit-based growth caused an explosion in unemployment, and a collapse in asset prices. In contrast to Ben Bernanke’s *a priori* notion that changes in debt were “pure redistributions” which, “Absent implausibly large differences in marginal spending propensities … should have no significant macro-economic effects”, {Bernanke, 2000 #1098, p. 24}, the change in debt was by far the major determinant of the level of unemployment, which rose dramatically as the rate of growth of private debt plummeted.
The US crisis was heralded, of course, by the bursting of the biggest house price bubble in America’s history.
Here the dynamics of debt had a sting in its tail: house prices are driven not by the level of housing credit (which is the flow of new mortgages), but by its rate of change. It is therefore not the level of

since, as I explain in chapter XX, the acceleration of mortgage debt is the main determinant of change in house prices. The acceleration of mortgage debt began to decline long before the change in debt in general slowed down, so that this data functioned as a harbinger of the approaching crisis.
The American economy followed Minsky’s script in its entirety. But a crisis did not occur in my home country of Australia, despite very similar data on private debt. Instead, it was one of just two OECD nations to avoid a recession during the GFC—the other was South Korea. Was this a sign that Minsky’s thesis doesn’t apply Down Under—or in the Pacific?

This was mainstream thinking in Australia, where Australia’s central bank (the Reserve Bank of Australia or RBA) took to referring to the 2008 crisis as the “North Atlantic Economic Crisis” rather than the “Global Financial Crisis”, to emphasise that “it didn’t happen here” (Stevens, 2011 #5181).

However, Australia did not avoid the crisis: it merely postponed it by restarting the debt bubble that caused it.

The Gambling Country

Australia countered the GFC with immediate and effective discretionary government policy, following the advice of its then Treasury Secretary Ken Henry to “Go hard, go early, and go households” (Gruen, 2008 #1306). Several of these interventions—such as boosting government spending so that firms which otherwise might go bankrupt would instead have their cash flows underwritten by a government deficit, and providing a direct cash grant to taxpayers to boost

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household spending (the very first instance of “helicopter money”)—were ones that Minsky had recommended.

But the key government policy that enabled Australia to postpone its crisis was to entice Australians back into its already inflated housing market, via a dramatic increase in an already generous government grant to first home buyers. Known as the “First Home Owners Grant” or FHOG, this scheme gave first home buyers a grant of A$7,000 towards their purchase—at a time when the average house price in Australia’s capital cities was $450,000 (Pink, 2009 #5178, p. 11). In what it described as the “First Home Owners Boost”—which I nicknamed the “First Home Vendors Boost”—the Australian Federal Government doubled this grant to $14,000 for the purchase of an existing dwelling, and trebled it to $21,000 for the purchase of a new dwelling. State governments added their own bonuses on top of this Federal largesse. The outstanding example was the Victorian State Government, which added another $14,000 for the purchase of a new property in a regional (non-capital-city) area.

With banks willing to provide a loan to a buyer with a 5% deposit, this grant meant that first home buyers did not need to have any savings of their own to qualify for a mortgage. First home buyers flocked into the market, thus stopping the decline of mortgage debt in its tracks, and re-starting the then faltering Australian housing bubble.
Figure 13: Housing bubbles in the USA and Australia

Australian house prices began to fall again in mid-2010 when the First Home Vendors’ Boost ended, but by that stage Australia was starting to benefit from another bubble: the incredible increase in demand from China, driven partly by its continued industrialisation drive, but significantly also by a credit bubble that was the Chinese government’s response to the GFC. So just as the Australian household sector started to de-lever, the corporate sector embarked on a borrowing spree to finance the investment in mines, ports and railways needed to satisfy that at the time was thought to be an insatiable Chinese demand for Australian coal and iron ore.

These two overlapping trends in private debt meant that though the rate of growth of private debt slowed down in Australia at the time of the GFC, it never turned negative as it did in the USA—compare Figure 14 with Figure 9. Private credit thus continued to stimulate the Australian economy, and the stimulus increased as the housing bubble and minerals boom accelerated from 2010 on.
As that boom gathered steam, a remarkable thing happened: much to the amazement of Australia’s central bank the RBA, inflation did not rise.

The RBA had been the last central bank in the world to realise that a crisis was afoot in 2008, and it continued to increase its reserve interest rate until March of 2008. It did not start cutting rates until August of 2008—fully a year after the GFC began. Cementing its status as the most out-of-touch Central Bank on the planet, it was then the first to start raising rates after the GFC—in the false belief that inflation remained the primary enemy of economic stability.

The facts begged to differ, and at the end of 2011 the RBA reluctantly reversed direction once more. Its change of direction was also partially motivated by the hope that lower rates would cause a resurgence in the housing market, since the Chinese export bounty had proven to be less generous than expected.
Australian households, faced with declining returns on bonds and a volatile stockmarket, duly took the RBA’s lead, and in early 2012 began to pile into the housing market once more—but this time not as first home buyers, but as “investors”. Mortgage debt, which had been falling as a percentage of GDP since the termination of the First Home Vendors’ Boost, started to rise again, and by the middle of 2012, house prices began to rise once more.

With rising household debt thrown on top of rising corporate debt, Australia returned to the exponential trajectory in its private debt to GDP ratio that had been so rudely interrupted by the GFC.
The contrast between Australia and the USA is stark. The GFC broke the exponential trend for America’s private debt to GDP ratio, and though private debt is rising relative to GDP, it is rising at nothing like the rate it was prior to the crisis—and nor should it. Though America has not de-levered by anywhere near enough to enable a return to sustained growth, its private debt ratio in September 2015 was 148% of GDP, 15% lower than at the time of the GFC. As of September 2015, Australia’s private debt to GDP ratio was 206% (on BIS figures), 20% higher than at the time of the GFC.
Australia is thus the counterpoint to the USA, which shows that you can avoid a debt crisis today by putting it off till later. The same debt dynamics that propelled and then crashed the US economy and its housing market are at work Down Under; the calamity of a debt-deflation has simply been delayed by continued borrowing.19

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19 The much stronger government stimulus in Australia in response to the GFC and the more trade-exposed nature of the Australian economy also attenuated the impact of domestic debt dynamics and economic performance in 2008-2010, but without altering the outcome of an increasing role for private debt growth in the economy.
When the slowdown in private debt growth begins in Australia—and there are signs that the slowdown is finally underway in 2016—the fall in demand engendered by falling credit will be substantially more severe than it would have been had Australia not borrowed its way out of trouble in 2008.
Of course, you may think that it could be possible for the Australian trend of ever-rising private debt to GDP to continue indefinitely. Why does private debt have to stop growing faster than GDP?

I have a one-word answer for you: Japan.

The Land of the Setting Sun

There was a time when popular culture accepted that Japan was going to do with sheer economic might what it had failed to do with military force in World War II. At the end of the 1990s, nine of the world’s ten biggest banks were Japanese; Japanese technology, from the Walkman to the Toyota Camry, led Western technology; and Hollywood made an ominous thriller starring with the title “The Rising Sun”.

A matter of months later, this vision of Japanese ascendancy terminated. Japan’s Nikkei Index crashed, its booming housing market tanked, and the country entered what it described as the “Lost Decade”—which has now persisted for a quarter century. Japanese technology is still influential, but Apple and Tesla now rule where Sony and Toyota were once ascendant. And crucially, none of Japan’s banks feature in the world’s top ten.
Many explanations of Japan’s malaise have been proffered by mainstream economists, from demographic decline to out of control government spending. A quarter of a century after its crisis began, the focus of conventional criticism today is overwhelmingly on its astronomical level of government debt. But the real cause of Japan’s sudden fall from grace was a private debt trap, just like the one that America blindly stumbled into eighteen years later.

*Figure 20: Japan’s debt to GDP ratios*

Japan always had a high private debt to GDP ratio, largely because its Keiretsu system of interlocking ownership between industrial conglomerates and dedicated banks meant that debt—from compliant banks—played a much larger role in financing corporate investment than it did in the USA. From 1965 till 1982, the corporate debt to GDP ratio in Japan averaged 100% of GDP, versus 42% in the United States. Then the bubble that resulted in the land area of the Imperial Palace in Tokyo having a notional value equivalent to that of California took off. Banks provided finance not simply for technology and industry, but for share and property speculation as well, in what Japan happily labelled its “Bubble Economy” period. Corporate debt rose by 40% of GDP in just 8 years.
Household debt, which had been growing rapidly but linearly (as a percentage of GDP) since 1965 from less than half the USA’s level, also accelerated in the late 1980s, and rose by almost 25% of GDP across the decade.
The combination of ballooning corporate and household debt drove Japan’s asset markets into the stratosphere: real house prices in Japan rose by 48% from 1985 till their peak in 1991. The Nikkei quadrupled in less than six years.
Then at the end of the 1980s, Japan’s debt fuelled party ended. The rate of growth of debt, which had risen from 12% of GDP per annum in 1985 to 27% p.a. in 1990, began a plunge that, by the end of the 1990s saw private debt falling at up to 13% of GDP p.a. The result was a collapse in aggregate demand, crashing asset prices, and crucially for the once Land of the Rising Sun, the end of debt-financed investment in new technologies. Japan’s major corporations were too busy repairing the bloated balance sheets to invest, and the sun abruptly set on Japan’s apparent economic imperialism.
The same dynamics that would play out in America 18 years later then ensued. Despite Japan’s enormous trade surpluses and the huge compensating stimulus from rising government debt once the crisis commenced, demand in Japan stagnated and unemployment rose.
Figure 25: Japan change in private debt and unemployment (Correlation -0.91 over 5 decades)

Japan private debt change and unemployment

Japan Central Bank, BIS and ILO Data

Japan Crisis  GFC

Japan

Debt Change  Unemployment

Percent of GDP per year

Percent of workforce


Debt Change

Unemployment
The qualitative characteristics of an approaching crisis identified by my Minsky model—an apparent "Great Moderation" in inflation and unemployment before the crisis, along with a rapid increase in the ratio of private debt to GDP—can be seen in the Japanese data from 1976 till 1990.
Crucially for the many countries that have emulated Japan’s pattern of a Bubble Economy followed by a crisis (including the USA and the UK), private debt in Japan stabilized at a still-high level after the crisis, and growth in debt terminated.
When credit stopped growing, so did Japan. The Japanese economy failed to revive after the crisis because, with the level of debt already so high, there was precious little appetite for a return to debt growth, and precious little capacity to borrow more either—even with reserve interest rates of zero. With credit either falling or negative, a vital source of demand in the Japanese economy disappeared, while every attempt to reduce debt by conventional means—by debt repayment or bankruptcy—reduced expenditure by as much, leaving the ratio of private debt to GDP stuck at a debilitatingly high level.

In the whodunit of “What killed the Japanese economy in 1990?”, Figure 28 is the smoking gun of credit.

The smoking gun of credit
You might wonder how the self-appointed detectives of economics could miss as stark a piece of evidence as Figure 28.20 It’s because their approach to sleuthing has more in common with Peter

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20 They can’t excuse themselves on the basis of a lack of evidence. Though there was no equivalent to the BIS’s excellent database on credit to the non-financial sector in 1990, the Japanese data on credit was available for
Sellers and the bumbling Inspector Clouseau than it has with Sir Arthur Conan Doyle and Sherlock Holmes.\textsuperscript{21} By a series of plausible but false propositions, they have blinded themselves to the obvious.

The original false proposition, which is drummed into students of economics in their first year at university, is that money is just a “veil over barter”, and that anyone who believes that changes in money magnitudes causes changes in “real” magnitudes—the physical amounts of commodities that are produced and consumed in the economy—is suffering from “money illusion”. Mainstream macroeconomics textbooks confidently berate fledgling economists that absolute prices don’t matter, and therefore neither does money: all that really matters are relative prices.

Rookie economic detectives are persuaded to this view by being asked to consider a consumer who has purchased a particular bundle of goods, and then asked what would change if all prices and her income were instantly doubled. “Why, nothing sir—she would still buy the same bundle of goods” is the correct answer—and any quibbling will have you derided as suffering from “money illusion”. From then on, the model of the economy is couched in terms of relative prices rather than monetary ones, and money itself disappears from the analysis. In the hands of true believers like Robert Lucas, who led the charge to reduce macroeconomics to applied microeconomics, the “absence of money illusion on the part of firms and consumers” results in an approach to macroeconomics that rules out any role for money, apart from causing inflation:

> It is natural (to an economist) to view the cyclical correlation between real output and prices as arising from a volatile aggregate demand schedule that traces out a relatively stable, upward-sloping supply curve. This point of departure leads to something of a paradox, since the absence of money illusion on the part of firms and consumers appears to imply a vertical aggregate supply schedule, which in turn implies that aggregate demand fluctuations of a purely nominal nature should lead to price fluctuations only. \textsuperscript{[Lucas, 1972 \#1414, p. 52. Emphasis added]}

Having eliminated money as a potential clue in any economic murder mystery, the next step in the mainstream economics detective manual is to write banks out of the script as well. Banks, it is asserted, are simply “intermediaries” between savers and borrowers: they play no active role in either lending or money creation. The key proposition is that there is no link between lending and the amount of money in the economy: the level of debt and the amount of money are two independent things:

> Think of it this way: when debt is rising, it’s not the economy as a whole borrowing more money. It is, rather, a case of less patient people—people who for whatever reason want to spend sooner rather than later—borrowing from more patient people. \textsuperscript{[Krugman, 2012 \#4110, p. 147]}

The corollary of this position is the one made by Bernanke when rejecting Fisher’s debt-deflation explanation for the Great Depression: that there is no link either between lending and changes in

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\textsuperscript{21} Peter Sellers plays Inspector Jacques Clouseau in Blake Edwards' comedy series The Pink Panther. If you haven’t seen Sellers in action as Clouseau, do yourself a favour and watch some YouTube clips like this one, where Clouseau fails to notice—let alone foil—a bank robbery: \url{https://www.youtube.com/watch?v=DaHG1x2Bq84}. 

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aggregate demand. Lending—even by banks—simply transfers spending power from one agent to another. Paul Krugman put this view forcefully in a blog debate\textsuperscript{22} with me in 2012, accusing me and others who argue that banks are more than intermediaries—and that bank lending does affect aggregate demand—of being “banking mystics”:

“banking is where left and right meet. – Both Austrians ... and Minskyites view banks as institutions that are somehow outside the rules that apply to the rest of the economy, as having unique powers for good and/or evil... – I guess I don't see it that way. Banks don't create demand out of thin air any more than anyone does by choosing to spend more; and banks are just one channel linking lenders to borrowers...” (Krugman, “Banking Mysticism”
http://krugman.blogs.nytimes.com/2012/03/27/banking‐mysticism/)

This argument sits rather uneasily with the third pillar of the mainstream model of money, the “money multiplier” model of money creation; but as befuddled detectives, mainstream economists are quite capable of holding two contradictory views at once.

The money multiplier model asserts that banks do in fact create money by lending, but in doing so, all they are doing is passively responding to government controls. In the model, the government creates reserve money for the banks, and the banks then hold on to a fraction of this—known as the “Required Reserve Ratio” or \textit{RRR}—and lend out the rest. Borrowers then deposit this newly created money at other banks, who repeat the process until ultimately the amount of new money created equals the original creation of reserves divided by the \textit{RRR}.

Since the \textit{RRR} is substantially less than 1—in America’s case, it is 10%, or 0.1 \{O’Brien, 2007 #1126, p. 52\}—then the amount of money created by bank lending is a multiple of the amount of reserves created by the government. But in this model, the government is in control, so if too much—or too little—money is created, then it is the government’s fault. This was the basis for Bernanke’s allegation that the Great Depression was caused by the Federal Reserve \{Bernanke, 2000 #1098, p. 153\},\textsuperscript{23} and also the basis of the advice President Obama followed in 2009, that the best way to rescue the economy from the GFC was not to give money to the public directly, but to give it to the banks instead \{Obama, 2009 #371\}.\textsuperscript{24}

As plausible as mainstream economists find these propositions, they are all fallacious.

\textsuperscript{22} It was more of a slanging match than a debate, initiated by Krugman on his blog without any attempt to contact me, and terminating with him seriously misconstruing my arguments \{Krugman, 2012 #4134\} in a fashion that led to many of his followers sharply criticising him on his blog—see the comments on jkwe22agcic dpq1arv9t kll pv vq3f3p. 2514527235252k3p. @wvhihh00gha1r1qg2#

\textsuperscript{23} “The monetary data for the United States are quite remarkable, and tend to underscore the stinging critique of the Fed’s policy choices by Friedman and Schwartz... U.S. nominal money growth was precisely zero between 1928:1V and 1929:IV... The year 1930 was even worse in this respect... The proximate cause of this decline in M1 was continued contraction in the ratio of base to reserves, which reinforced rather than offset declines in the money multiplier. This tightening ... locates much of the blame for the early (pre-1931) slowdown in world monetary aggregates with the Federal Reserve... The years 1931 and 1932 were utter disasters for the United States in terms of monetary growth...”

\textsuperscript{24} “And although there are a lot of Americans who understandably think that government money would be better spent going directly to families and businesses instead of banks – “where’s our bailout?,” they ask – the truth is that a dollar of capital in a bank can actually result in eight or ten dollars of loans to families and businesses, a multiplier effect that can ultimately lead to a faster pace of economic growth.”
The first proposition, that doubling all prices and all incomes won’t change any “real” magnitudes—by which economists mean the quantity of goods and services produced and consumed in the economy—doesn’t survive even casual scrutiny, once you accept the undeniable fact that debt exists.

Given that debt exists, then some “agents” will be debtors, and others will be creditors (it doesn’t matter whether this involves bank debt or debt between non-bank agents). When you “double all income and all prices”, what do you do to the price of money—the interest rate? It is the cost of money for debtors, but an income source for creditors. If you double it, then you make debtors worse off and creditors better off—and with this change in the distribution of income, there will be changes in demand and therefore in output: real magnitudes in the economy will change.

If you keep the rate of interest constant in your hypothetical “double all incomes and all prices” exercise, then debtors are better off and creditors are worse off. Again, there will be a change in the distribution of income, and hence a change in “real” factors. A change in money prices and money income therefore can and does have “real effects”. So people like me who assert that monetary changes will have real effects aren’t suffering from “money illusion”. Instead mainstream economists are suffering from “barter illusion”: the false belief that capitalism can be analysed without considering money at all.

The arguments that banks are “mere intermediaries” between savers and borrowers, that there is no link between bank lending and the money supply, and that banks simply “‘multiply up’ central bank money to create new loans and deposits” were all recently debunked by no less than the Bank of England, in the paper “Money creation in the modern economy”:

> In the modern economy, most money takes the form of bank deposits. But how those bank deposits are created is often misunderstood: the principal way is through commercial banks making loans. *Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrower’s bank account, thereby creating new money.*

The reality of how money is created today differs from the description found in some economics textbooks:

- Rather than banks receiving deposits when households save and then lending them out, bank lending creates deposits.
- In normal times, the central bank does not fix the amount of money in circulation, nor is central bank money ‘multiplied up’ into more loans and deposits. {McLeay, 2014 #5066, p. 1}

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25 The same observation can be made for the prices of all other commodities—they will be a determinant of costs for some agents, and incomes for others. But the issue here is that you are using money as your “measuring stick”, and you can only affect all prices and incomes equally by doubling them in money terms *if money itself is costless*—if it is simply a token that in itself doesn’t generate incomes or costs—and if people held only trivial amounts of it, and don’t trade it per se between each other for a money price. This would be the case if and only if money was both “pure fiat”—a token issued by some non-market entity (like the government) and it wasn’t stored, or lent between agents in return for interest payments. None of these situations is realistic: money is part fiat money (created by the government) and part credit-money (created by banks); and money is stored, and lent at interest between agents.
The Bank’s factual statement that “Whenever a bank makes a loan, it simultaneously creates a matching deposit in the borrower’s bank account, thereby creating new money” helps explain the logic behind Figure 28, which adds credit to GDP to measure total expenditure in an economy. To some non-mainstream economists, this appears to violate an inviolable principle of economics, that expenditure is identical to income (Fiebiger, 2014 #5087; Lavoie, 2014 #5086). But it is easy to show that it does not, using tables showing expenditure, income, and bank borrowing all at once.

Well, relatively easy: you’re going to have to think to follow the logic, but if you’ve got this far in the book, you should find it straightforward. But maybe a good night’s sleep—or a strong cup of coffee—is in order first. After all, this does involve a bit of accounting, and that tends to make even accountants feel sleepy.

Back? Good. The next three tables obey what is known as the “Fundamental Law of Accounting”, that “Assets minus Liabilities equals Equity”, and show the monetary flows in a stylised 3 sector view of an economy from the banking system’s point of view. Each sector (imaginatively labelled S1, S2, and S3) has a bank account out of which it spends, and the bank has two accounts of its own: Loans (which are an asset of the bank) and BE, which is the net equity of the bank.

For the sake of simplicity only, I’m going to ignore bank interest payments on deposits, and also ignore the bank’s own expenditure until it has some “skin in the game” via making loans—which in the first two tables, it doesn’t do.

In each table, I signify flows by lowercase letters, and stocks—when they turn up in the argument—by uppercase letters. So “a” represents a flow of “a” dollars a year (where “a” might be $1 trillion a year, for example). When I consider interest on loans, I use a lowercase Greek “r” (r) for the rate of interest.

Each row is labelled by the sector as well (S1, S2, S3, and BE), and where the row and account labels are the same, the cell shows the expenditure by that sector on the others. So in Table 1, sector S1 spends the sum of (a+b) dollars per year buying goods and services from sectors S2 and S3. Its expenditure becomes an identical amount of income per year for those other sectors.

Since expenditure by S1 shows money flowing out of its sector, I show expenditure as a negative, and since that become an income for the other two sectors, I show the income to sectors S2 and S3 as a positive. Each row therefore necessarily sums to zero, and this displays the logic behind the statement that one sector’s expenditure is another sector’s income.

It follows that the negative sum of the entries on the diagonal (i.e., where the row label is the same as the column label) equals aggregate expenditure for this stylised economy, while the positive sum of the entries on the off-diagonal equals aggregate income. The two are necessarily equal, which is the basis of the statement that aggregate income is identically equal to aggregate expenditure.

Looking at Table 1, where no lending occurs, aggregate expenditure equals (a+b) + (c+d) + (e+f) dollars per year, while aggregate income equals the identical amount of a+b+c+d+e+f dollars per year—which is nothing remarkable.

*Table 1: No lending takes place*

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans</td>
<td>S1</td>
<td>S2</td>
</tr>
</tbody>
</table>

The emphasis is in the original.
Now if we consider Table 2, where lending between sectors takes place—Sector 2 lends to Sector 1—we get a slightly more complicated and interesting outcome. Sector 2 lends $L$ dollars per year to Sector 1 that it would otherwise have spent on Sector 3—so it now spends the amount of $d-L$ dollars per year on Sector 3, while Sector 1 now spends $b+L$ dollars per year on Sector 3.\(^{27}\) The amount $L$ is a flow of new debt, in which case there must also be an outstanding stock of existing debt which I signify by uppercase $\mathcal{L}$.\(^{28}\) Sector 1 therefore has to pay interest on this stock to Sector 2—which is why Sector 2 would consider making a loan in the first place—so Sector 1 is liable to pay interest to Sector 2 at the rate of $\rho \cdot \mathcal{L}$ dollars per year.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\multicolumn{2}{|c|}{Level ($\mathcolor{white}{\$} \text{)} \quad \text{Flows ($\mathcolor{white}{\$} \text{Year)}}} \\
\hline
S_1 & $-(a+b)$ & $a$ & $b$ \\
S_2 & $c$ & $-(c+d)$ & $d$ \\
S_3 & $e$ & $f$ & $-(e+f)$ \\
B_E & & & \\
\hline
\end{tabular}
\caption{Lending between sectors takes place}
\end{table}

Here we get a more interesting outcome: aggregate expenditure and income remain identical of course, but in this case, \textit{interest on outstanding debt turns up as a component of both aggregate expenditure and aggregate income:}\(^{29}\)

\begin{align*}
AE = AY = (a+b+l+\rho \cdot \mathcal{L})+(c+(d-l))+(e+f) \\
= a+b+\rho \cdot \mathcal{L}+c+d+e+f
\end{align*}

The flow of new debt $L$ (which is the rate of change, in dollars per year, of the outstanding stock of debt of $\mathcal{L}$ dollars) does not appear, because its “nets out” between Sector 1 and Sector 2: when lending is between one non-bank sector and another, one sector’s expenditure falls (by $L$ dollars per year) to enable it to make the loan to the other Sector, which allows the borrowing Sector’s expenditure to exceed its income.

Finally, Table 3 shows the realistic situation of bank lending—and the outstanding stock of debt is now shown as an asset of the banking system of $\mathcal{L}$ dollars. Sector 1 spends the flow credit of $L$ dollars per year created by the flow of new debt (of $L$ dollars per year) on Sector 3 as before, and still pays

\(^{27}\) For simplicity, I’m ignoring that Sector 1 could spend some of the borrowed money on Sector 2, and that Sector 2’s lending to Sector 1 could be financed by Sector 2 spending less money on Sector 1 as well as Sector 3; the logical outcome would be the same if I took those issues into account, but the table would be a lot messier.

\(^{28}\) The level of the loan $\mathcal{L}$ doesn’t appear on its own in Table 2 because in this mainstream model, known as “Loanable Funds”, the loan is neither an asset nor a liability of the banking sector. Instead, the loan is an asset of Sector 2 and a liability of Sector 1.

\(^{29}\) Interest on deposits is also part of aggregate demand: gross (not net) financial transactions are part of gross expenditure and income.
interest on the outstanding debt at the rate of $\rho \cdot L$ dollars per year, though now it pays this amount to the bank’s equity account rather than to Sector 2.

**Table 3: Bank lending takes place**

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Flows ($/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loans</td>
<td>S₁</td>
<td>$- (a + b + l + \rho \cdot L)$</td>
</tr>
<tr>
<td></td>
<td>S₂</td>
<td>$a + b + l$</td>
</tr>
<tr>
<td></td>
<td>S₃</td>
<td>$\rho \cdot L$</td>
</tr>
<tr>
<td></td>
<td>Bₑ</td>
<td>$a + b + l + \rho \cdot L$</td>
</tr>
</tbody>
</table>

Now when we sum aggregate expenditure and aggregate income, it becomes obvious why bank lending makes an enormous difference to macroeconomics: the flow of credit $l$ (in dollars per year) created by the flow of new debt (of $L$ dollars per year) is part of both aggregate expenditure and aggregate income:

$$AE \equiv AY = (a + b + l + \rho \cdot L) + (c + d) + (e + f) + (g + h + i)$$

This shows why bank lending is fundamentally different to lending between non-bank agents. A change in debt between two non-bank agents has no effect on the quantity of money in existence: it merely redistributes the existing stock of money between them. It also changes aggregate expenditure only if there is a significant difference in the spending propensities of the two agents, or if the lending changes spending patterns.

However, a change in bank debt both changes the amount of money in existence, and changes demand and income by the same amount, because it is not offset by any change in spending by the lender: the bank does not lend out money it has “saved”, but creates new money and debt at precisely the same moment. This is why there is a one for one equivalence between the change in bank debt, and credit, and demand, and income.

Crucially, it is also possible for the change in debt ($l$ in the preceding tables) to be negative when agents are in the aggregate repaying debt, rather than taking on new debt. While rising debt increases both aggregate demand and aggregate income, falling debt causes them to fall.

One more element of realism is needed to apply this insight to actual economic data: borrowing can be used to finance not merely the purchase of a flow of new goods (which is part of GDP), but also the purchase of assets. The hermetic separation of macroeconomics and finance that is also part of mainstream economic theory is therefore also invalid. The change in debt will be part of the demand for assets as well as demand for goods, so that a more accurate relationship is that aggregate expenditure is the sum of expenditure on goods and services plus expenditure on assets, and this will be identical to aggregate income plus realised capital gains. Since the vast majority of money that is borrowed into existence today is used to buy assets rather than goods and services, the impact of a downturn in credit-based expenditure is felt first on asset markets.

The question then arises of how to measure these flows: is it valid to add GDP to credit, as I have done to construct Figure 28 (and Figure 7 and Figure 14)? Yes, it is, which is the reason that I have laboured the point throughout the preceding argument that all flows are in terms of dollars per year. GDP is measured as dollars per year (even though the data is recorded and published every quarter),
and the same applies to credit, which is identical to the change in debt. It is thus dimensionally valid to add them together to measure aggregate expenditure per year (and also aggregate income plus realised capital gains) at a given point in time.\(^{30}\)

If this still sounds like double-counting to you, consider the analogy of measuring the flow of water in a river (in cubic metres per year), where there is a pump at a specific point that can either pump water into the river, or extract water from it. The flow at the point where the pump stands will be equivalent to the flow of the river in cubic metres per year, plus the flow (in or out) of water from the pump, also measured in cubic metres per year.

The flow of water already in the river is calculated by measuring the cross-sectional area of the river at one point in square metres, and the rate of flow of the river at that point in metres per year. Multiply one by the other, and you have the annual flow of water in the river, independent of the actions of the pump.

The actual flow of water at that point will be the sum of the two flows, in cubic metres per year. Mathematically, it will be equivalent to the flow (determined by the river) plus its rate of change (determined by the pump).\(^{31}\) If you ignore the pump when trying to calculate the rate of flow of water, you’re going to get a very inaccurate measure if the pump is of a comparable scale to the river itself.

GDP, which can be decomposed into the existing stock of money\(^{32}\) times its annual turnover,\(^{33}\) is comparable to the flow of water in the river. Credit, which is equivalent to the change in debt, is comparable to the flow of water through the pump. If you ignore credit when trying to calculate the annual total expenditure, you’re going to get a very inaccurate measure when credit is of a comparable scale to GDP itself.\(^{34}\)

The explains why the level of private debt matters, as well as its rate of change. Here I have to thank the American philanthropist Richard Vague for identifying a significant empirical regularity: every economic crisis in the last one and a half centuries has manifested the combination of a private debt to GDP ratio of 150%, and an increase in that ratio over a five-year period of 17% or more {Vague, 2014 #5119}.

The reason for this empirical regularity is that impact of a slowdown in the rate of growth of debt depends both on its level, and its rate of change—as the next few tables illustrate.

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\(^{30}\) I have found this hard to convey even to my fellow non-mainstream “Post-Keynesian” economists, because the dominant approach they take to analysing dynamic processes is to think in terms of what they call “periods”—an artificial division of time into discrete chunks of normally a year—rather than treating time as continuous {Fontana, 2003 #5180}. This makes it very difficult to work out when the change in debt occurs—does it take place inside a period, or between them? Technically this approach is equivalent to working in discrete rather than continuous time, which is appropriate for discrete dynamic processes that occur in a synchronised manner (such as the birth of Christmas Island Red Crabs, which occurs once every year on one full moon) rather than to discrete dynamic processes that are not synchronised (such as the investment and consumption activities of millions of independent entities in a capitalist economy).

\(^{31}\) In an equation, using \(F\) for the flow of the river and \(\dot{F}\) for the flow of the pump, the total flow will be \(F + \dot{F}\) cubic metres per year.

\(^{32}\) This is similar to the cross-sectional area of the river, measured in square metres.

\(^{33}\) This is similar to the rate of flow of the river in metres per year.

\(^{34}\) In an equation, decomposing GDP into the existing stock of money \(M\) times its annual turnover \(V\), and using for \(\dot{L} = L = \dot{M}\) for credit, the total flow of expenditure (and income plus realised capital gains) per year will be \(V \cdot M + L = V \cdot M + L = V \cdot M + \dot{M}\).
Imagine an economy with a GDP of one trillion dollars a year, where private debt is growing twice as fast as GDP—debt is growing at 20% per annum in nominal terms, and GDP is growing at 10%—and ignore for the moment any feedback between credit and GDP growth. What happens to aggregate demand (and aggregate income plus realized capital gains) if the rate of growth of debt simply slows down to the same as the rate of growth of GDP—so that the ratio of debt to GDP stabilises?

If debt starts at a relatively low level of 50% of GDP and then grows faster than GDP for 5 years before the debt to GDP ratio stabilises, then in the 6th year the rate of growth of total expenditure falls from 11.1% to 4.3% per year—a substantial fall, but not a recession (see Table 4).

Table 4: The impact of a slowdown in credit when the debt/GDP ratio is 77%

<table>
<thead>
<tr>
<th>Years</th>
<th>GDP</th>
<th>Debt</th>
<th>Debt to GDP Ratio</th>
<th>Credit</th>
<th>Total Demand</th>
<th>Demand Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$1,000</td>
<td>$500</td>
<td>50%</td>
<td>$100</td>
<td>$1,200</td>
<td>10.8%</td>
</tr>
<tr>
<td>1</td>
<td>$1,100</td>
<td>$600</td>
<td>55%</td>
<td>$120</td>
<td>$1,330</td>
<td>10.9%</td>
</tr>
<tr>
<td>2</td>
<td>$1,210</td>
<td>$720</td>
<td>60%</td>
<td>$144</td>
<td>$1,475</td>
<td>11.0%</td>
</tr>
<tr>
<td>3</td>
<td>$1,331</td>
<td>$864</td>
<td>65%</td>
<td>$173</td>
<td>$1,637</td>
<td>11.1%</td>
</tr>
<tr>
<td>4</td>
<td>$1,464</td>
<td>$1,037</td>
<td>71%</td>
<td>$207</td>
<td>$1,818</td>
<td>11.0%</td>
</tr>
<tr>
<td>5</td>
<td>$1,611</td>
<td>$1,244</td>
<td>77%</td>
<td>$124</td>
<td>$1,896</td>
<td>4.3%</td>
</tr>
<tr>
<td>6</td>
<td>$1,772</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If debt starts at 100% of GDP, then it is 155% of GDP by the fifth year, and in the 6th year total expenditure falls by 0.2%—even though GDP is still rising at 10% per annum, and credit is still positive.

Table 5: The impact of a slowdown in credit when the debt/GDP ratio is 155%

<table>
<thead>
<tr>
<th>Years</th>
<th>GDP</th>
<th>Debt</th>
<th>Debt to GDP Ratio</th>
<th>Credit</th>
<th>Total Demand</th>
<th>Demand Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$1,000</td>
<td>$1,000</td>
<td>100%</td>
<td>$200</td>
<td>$1,300</td>
<td>11.5%</td>
</tr>
<tr>
<td>1</td>
<td>$1,100</td>
<td>$1,200</td>
<td>109%</td>
<td>$240</td>
<td>$1,450</td>
<td>11.7%</td>
</tr>
<tr>
<td>2</td>
<td>$1,210</td>
<td>$1,440</td>
<td>119%</td>
<td>$288</td>
<td>$1,619</td>
<td>11.8%</td>
</tr>
<tr>
<td>3</td>
<td>$1,331</td>
<td>$1,728</td>
<td>130%</td>
<td>$346</td>
<td>$1,810</td>
<td>11.9%</td>
</tr>
<tr>
<td>4</td>
<td>$1,464</td>
<td>$2,074</td>
<td>142%</td>
<td>$415</td>
<td>$2,025</td>
<td>-0.2%</td>
</tr>
<tr>
<td>5</td>
<td>$1,611</td>
<td>$2,488</td>
<td>155%</td>
<td>$452</td>
<td>$2,020</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$1,772</td>
<td>$2,737</td>
<td>155%</td>
<td>$494</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If debt in the final year is 193% of GDP—and 14 of the 41 countries in the BIS database exceed this level today—then the fall in total expenditure in the final year is 2.2%, even though GDP is still growing and credit is still positive (see Table 6).

Table 6: The impact of a slowdown in credit when the debt/GDP ratio is 193%

<table>
<thead>
<tr>
<th>GDP Growth Rate</th>
<th>10%</th>
<th>10%</th>
<th>10%</th>
<th>10%</th>
<th>10%</th>
<th>10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Growth Rate</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>Final Debt Growth Rate</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Initial Debt Ratio</td>
<td>125%</td>
<td>125%</td>
<td>125%</td>
<td>125%</td>
<td>125%</td>
<td>125%</td>
</tr>
</tbody>
</table>
So the hope that I have seen some central bank economists express, that the level of private debt to GDP can stabilise without any ill-effects on the economy, is simply false. Once an economy has a substantial level of private debt to GDP, and that ratio is growing, then even a stabilisation of the ratio *without any reduction in the rate of GDP growth* will cause a serious recession. And of course in practice GDP growth does drop, and the debt to GDP ratio also normally falls in the crisis phase as well—hence the empirical regularity found by Vague occurs at lower levels than in these hypothetical tables.

So credit is the cause of both the booms and the slumps of the global economy, and its smoking gun can be found at the scene of every economic crisis—even ones like Spain (Figure 29) and Greece (Figure 30) where the suicidal policies of the Eurozone are a key additional cause of economic failure.

<table>
<thead>
<tr>
<th>Years</th>
<th>GDP</th>
<th>Debt</th>
<th>Debt to GDP Ratio</th>
<th>Credit</th>
<th>Total Demand</th>
<th>Demand Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>$1,000</td>
<td>$1,250</td>
<td>125%</td>
<td>$250</td>
<td>$1,350</td>
<td>11.9%</td>
</tr>
<tr>
<td>1</td>
<td>$1,100</td>
<td>$1,500</td>
<td>136%</td>
<td>$300</td>
<td>$1,510</td>
<td>12.0%</td>
</tr>
<tr>
<td>2</td>
<td>$1,210</td>
<td>$1,800</td>
<td>149%</td>
<td>$360</td>
<td>$1,691</td>
<td>12.1%</td>
</tr>
<tr>
<td>3</td>
<td>$1,331</td>
<td>$2,160</td>
<td>162%</td>
<td>$432</td>
<td>$1,896</td>
<td>12.3%</td>
</tr>
<tr>
<td>4</td>
<td>$1,464</td>
<td>$2,592</td>
<td>177%</td>
<td>$518</td>
<td>$2,129</td>
<td>-2.2%</td>
</tr>
<tr>
<td>5</td>
<td>$1,611</td>
<td>$3,110</td>
<td>193%</td>
<td>$311</td>
<td>$2,083</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>$1,772</td>
<td>$3,421</td>
<td>193%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 29: Spain GDP and Credit

Spain GDP and Credit

GDP
GDP + Credit
Credit

BILion Euro per year

Change in Private Debt per year as percent of GDP

GFC
The recent declines in the unemployment rates in Spain and Greece, which are being touted by the European Union as signs of the success of its austerity policies, are in fact the consequence of an increase in credit—even though it is still negative, its slower rate of decline has meant an increase in aggregate demand.
Figure 31: Spain credit & unemployment (Correlation -0.94)

Spain private debt change and unemployment (Correlation -0.94)

BIS and ILO Data

Debt Change
Unemployment

GFC
Credit has thus been not merely a killer of economies, it has become a serial killer, and it continues to wreak its havoc right under the moustaches (and beards)\(^{35}\) of the Inspector Clouseaus of mainstream economics. Who are its next targets, and what will become of those economies it has already killed?

The Walking Dead of Debt
Credit is not so much a serial killer as a serial Zombiefier: the economies that have had a crisis are the Walking Dead of Debt, rather than the strictly deceased. These economies are characterised by a very high level of private debt (more than 150% of GDP), which peaked after a crisis (Japan in 1990, and around 2008 for victims of the Global Financial Crisis), and a low to negative rate of growth of debt—and hence low or negative credit-based demand—since that crisis. Potential future “Debt Zombies” are countries where private debt levels are high, and where private debt is still rising much faster than nominal GDP: the higher the debt level and the higher the rate of growth of debt, the more likely they are to become Zombies.

Table 7 enables us to separate the Walking Dead from the Zombies-To-Be amongst the world’s Advanced economies (no Emerging economy has as yet had a debt crisis—at least since the Asian crisis in 1997—though several will experience one soon).

Table 7: Advanced country private debt ratio levels and growth rates

<table>
<thead>
<tr>
<th>Country</th>
<th>Private Debt to GDP Ratio</th>
<th>Debt Growth as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Today</td>
<td>GFC</td>
</tr>
<tr>
<td>Ireland</td>
<td>258%</td>
<td>222%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>237%</td>
<td>233%</td>
</tr>
<tr>
<td>Sweden</td>
<td>237%</td>
<td>185%</td>
</tr>
<tr>
<td>Norway</td>
<td>233%</td>
<td>197%</td>
</tr>
<tr>
<td>Denmark</td>
<td>232%</td>
<td>235%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>210%</td>
<td>178%</td>
</tr>
<tr>
<td>Canada</td>
<td>207%</td>
<td>167%</td>
</tr>
<tr>
<td>Belgium</td>
<td>207%</td>
<td>165%</td>
</tr>
<tr>
<td>Australia</td>
<td>206%</td>
<td>186%</td>
</tr>
<tr>
<td>Portugal</td>
<td>197%</td>
<td>192%</td>
</tr>
<tr>
<td>France</td>
<td>181%</td>
<td>150%</td>
</tr>
<tr>
<td>Finland</td>
<td>179%</td>
<td>143%</td>
</tr>
<tr>
<td>Spain</td>
<td>176%</td>
<td>203%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>174%</td>
<td>185%</td>
</tr>
<tr>
<td>Japan</td>
<td>167%</td>
<td>165%</td>
</tr>
<tr>
<td>UK</td>
<td>156%</td>
<td>180%</td>
</tr>
<tr>
<td>USA</td>
<td>150%</td>
<td>166%</td>
</tr>
<tr>
<td>Austria</td>
<td>148%</td>
<td>138%</td>
</tr>
<tr>
<td>Greece</td>
<td>129%</td>
<td>98%</td>
</tr>
<tr>
<td>Italy</td>
<td>122%</td>
<td>110%</td>
</tr>
<tr>
<td>Germany</td>
<td>108%</td>
<td>117%</td>
</tr>
</tbody>
</table>

History also tells us who the Zombies are, starting most obviously with Japan in 1990 and the USA in 2008. Ireland, Portugal, and Spain are other acknowledged victims of private debt bubbles. However, the data lets us identify several others—most importantly the UK—that had a private debt crisis, even if they weren’t aware of it at the time.36

Table 8 list the Zombies, using the criteria of (a) a high level of private debt relative to GDP caused by a boom fuelled by rising credit; followed (b) by a crisis caused by a decline in credit and (c) an aftermath with a still-high level of private debt. The persistently high level of private debt after the crisis is why these countries are in a Zombie-like state: sustained growth in the private debt ratio from these already high levels cannot be achieved, so credit-based demand after the crisis is at best subdued, and at worst negative (if debt is falling).

Japan, the original Debt Zombie, has frequently experienced negative credit since 1998 (see Figure 28 on page 43). America, the biggest Debt Zombie, has seen the average level of credit fall from

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36 And also Greece, Denmark, and to some degree New Zealand and The Netherlands. The USA, Japan, Spain and Greece have already been profiled; I'll consider the UK and XX in this section.
10.5% of GDP in the five years before its crisis to 4.4% of GDP after it. Credit averaged 15% of GDP for all the Debt Zombies in the 5 years before their crises, and just 4.3% of GDP afterwards. This is the real cause of the continued stagnation that Larry Summers has, like Alvin Hansen before him, has termed “secular stagnation”. Both Hansen and Summers falsely blame the post-crisis slump on a decline in innovation and population growth, when the real cause is the evaporation of credit-based demand.

The date of each country’s crisis is derived by locating the peak level of GDP plus credit. For the USA, this was in April 2006—more than a year before BNP’s woes led to the finance markets realising that the Ponzi Party was over.

Table 8: The Walking Dead of Debt

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP US$b</th>
<th>% Private Debt</th>
<th>% World</th>
<th>Crisis Date</th>
<th>Aver 5 years before</th>
<th>Credit % GDP</th>
<th>After</th>
<th>Maxim Date</th>
<th>Level Lates</th>
<th>Average Unemployment</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>$17,805</td>
<td>27.0%</td>
<td>27.0%</td>
<td>2006.4</td>
<td>10.5%</td>
<td>4.4%</td>
<td>2008.7</td>
<td>169.5%</td>
<td>150.0%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Japan</td>
<td>$4,128</td>
<td>6.3%</td>
<td>7.0%</td>
<td>1990.2</td>
<td>18.2%</td>
<td>0.2%</td>
<td>1995.0</td>
<td>221.0%</td>
<td>167.5%</td>
<td>2.6%</td>
</tr>
<tr>
<td>UK</td>
<td>$2,810</td>
<td>4.3%</td>
<td>4.4%</td>
<td>2008.3</td>
<td>13.5%</td>
<td>2.1%</td>
<td>2009.7</td>
<td>196.7%</td>
<td>156.4%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Spain</td>
<td>$1,198</td>
<td>1.8%</td>
<td>2.1%</td>
<td>2006.9</td>
<td>21.5%</td>
<td>2.0%</td>
<td>2010.5</td>
<td>217.9%</td>
<td>175.9%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Netherla</td>
<td>$757</td>
<td>1.1%</td>
<td>1.8%</td>
<td>2007.2</td>
<td>12.1%</td>
<td>5.3%</td>
<td>2010.5</td>
<td>246.9%</td>
<td>236.8%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Denmark</td>
<td>$298</td>
<td>0.5%</td>
<td>0.7%</td>
<td>2006.0</td>
<td>14.7%</td>
<td>9.0%</td>
<td>2010.2</td>
<td>268.1%</td>
<td>232.2%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Ireland</td>
<td>$230</td>
<td>0.3%</td>
<td>0.6%</td>
<td>2006.5</td>
<td>21.9%</td>
<td>13.2%</td>
<td>2010.4</td>
<td>329.7%</td>
<td>257.6%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Portugal</td>
<td>$199</td>
<td>0.3%</td>
<td>0.4%</td>
<td>2008.5</td>
<td>14.0%</td>
<td>0.6%</td>
<td>2013.1</td>
<td>229.1%</td>
<td>196.6%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Greece</td>
<td>$197</td>
<td>0.3%</td>
<td>0.3%</td>
<td>2008.3</td>
<td>12.5%</td>
<td>-0.8%</td>
<td>2011.6</td>
<td>134.8%</td>
<td>128.5%</td>
<td>9.4%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>$156</td>
<td>0.2%</td>
<td>0.3%</td>
<td>2007.4</td>
<td>16.2%</td>
<td>6.8%</td>
<td>2009.2</td>
<td>193.7%</td>
<td>174.3%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

Every country in this table has the tell-tale sign of the smoking gun of credit as the real cause of their economic slowdowns, but of course the political narrative in each country ascribed a different cause. The standard practice has been to describe a major symptom of the crisis—the blowout in government spending—as its cause. Nowhere has this diversionary tactic been more successful than in the UK.37

37 The other countries identified as current Debt Zombies are profiled in the website for this book.
The UK: Blaming the Symptom for the Disease

The great political success of the UK’s Conservative Party has been to convince the voting public, much of the media, and even their political opponents the Labour Party, that the UK’s recession in 2008 was caused by the deficits run by the then Labour government. The Conservative Party 2015 manifesto described Britain’s recession in 2008 as “Labour’s Great Recession”, and alleged that the economy recovered because the Conservative Government had halved the deficit since coming to office:

Five years ago, Britain was reeling from the chaos of Labour’s Great Recession; in 2014 we were the fastest growing of all the major advanced economies – last year, we grew 75 per cent faster than Germany, three times faster than the Eurozone and seven times faster than France. Five years ago, the budget deficit was more than 10 per cent of GDP, the highest in our peacetime history, and the national debt was rising out of control; today, the deficit is half that level and debt as a share of national income will start falling this financial year. {Party, 2015 #5183}

Rather than challenging this narrative—by, for example, pointing out that 2008 recession had been a global phenomenon (see Figure 33) and therefore it could not be the fault of the UK government alone—the Labour Party accepted it. Its 2015 election manifesto emphasised, ad nauseam, that it would, if re-elected, “cut the deficit every year”:

A Labour government will cut the deficit every year. The first line of Labour’s first Budget will be: “This Budget cuts the deficit every year”. This manifesto sets out that we will only lay a Budget before the House of Commons that cuts the deficit every year, which the OBR will independently verify.

We will get national debt falling and a surplus on the current budget as soon as possible in the next parliament. This manifesto sets out that we will not compromise on this commitment. {Party, 2015 #5182. Emphasis added.}38

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38 These were the 3rd and 4th paragraphs in the document, and the preceding ones simply led into this mea culpa.
This was not an election manifesto: it was a confession of guilt. But in fact the only thing the Blair/Brown Labour Government was guilty of was being in office when the staggeringly unsustainable trend in UK private debt growth broke.

Just how unsustainable that trend was has only become obvious since the crisis, thanks to the work of the Bank of International Settlements in producing a global database of private and government debt, and the Bank of England via its publication “The UK recession in context — what do three centuries of data tell us?” (Hills, 2010 #5184). What that data tells us, most emphatically, is that the bubble in private debt in the UK between 1980 and 2008 was both unsustainable and historically unprecedented. Private debt, which had never exceeded 75% of GDP in England’s history, rose from 60% of GDP in the late 1970s to 127% of GDP by 1991, and then a peak level of 197% of GDP in mid-2009.
If any politician or political party deserves the blame for the 2008 recession, it was not Gordon Brown and the 2005-10 Labour Party, but Maggie Thatcher and the 1979-90 Conservative Party. The private debt to GDP ratio had shown no trend for the century before Thatcher; shortly after her ascent to power, the debt ratio began to ascend three times faster than it was rising in the USA. Thatcher’s championing of financial deregulation unleashed The City of London, which rode this rocket of debt to become a dominant political and economic force in the UK.

This ascent had to end, and by the time it peaked, the debt ratio had reached 3.3 times the 1980 level. In contrast, the private debt ratio in the USA when its debt level peaked was “only” 1.75 times its 1980 level. The UK’s sum of GDP plus credit peaked in March 2008, and began to fall in April 2008—see Figure 34. This is also the official date for the start of the UK’s 2008 recession.
Far from the UK government deficit causing the 2008 recession, it—and similarly expanded government deficits around the world (even in Germany)—softened the blow from the collapse in credit-financed demand. Though the link is not as strong as in the other countries profiled so far (Figure 10 for the USA, Figure 18 for Australia, Figure 25 for Japan, Figure 31 for Spain and Figure 32 for Greece) the same dynamics that were at play in those countries are evident in the UK data as well: the collapse in credit-based demand caused the recession, and only an expanded government deficit prevented that collapse in demand from causing Depression-level unemployment rates.
The increase in government spending at the time of the crisis was largely built in to the UK’s fiscal system: with government revenue based largely on income tax, and government spending largely determined by the level of unemployment, declining tax receipts and rising unemployment drove the government into a larger deficit. The causal link thus runs from credit to employment, and employment to government spending—not vice versa. Government debt, which had generally been falling as a share of GDP from the end of WWII, rose as a consequence of the collapse in credit-based demand. Even though this increase was dramatic in the post-WWII context, it resulted in by no means an unprecedented level of government debt.
Rising government spending in turn attenuated how severe the economic downturn was—as it had done earlier in Japan and the USA. Government spending provided firms and households with an alternative source of cash flow with which private debt could be serviced. Without it—as was the case in the beginning of the Great Depression, and as is the case now just across the Channel in the EU zone—unemployment would have risen dramatically. With it, unemployment still rose, but not to the crushing levels of the Great Depression, or the Maastricht-Treaty inspired strangulation of southern Europe today.
Figure 37: Unemployment caused government debt to rise, and the rise in government debt attenuated the increase in unemployment

Now, in the aftermath to its debt bubble, credit demand in Britain is anaemic. From 1980 till the crisis, credit-based demand was equivalent to 11.5% of GDP every year. Since the crisis, it has averaged 2% of GDP—and it is currently zero (see Figure 34). This, and not the government deficit, is the reason that the UK economy is effectively becalmed—or Zombiefied—along with all the other countries listed in Table 8.

But as in any good Zombie thriller, the key question is not so much “Who are the Zombies?” as “Who’s going to be next?”

**Zombies-To-Be**

While picking the timing is difficult—as Australia showed in 2008, a crisis can be put off for years if the private sector can be enticed to continue borrowing—the indicators of (a) the debt to GDP ratio and (b) how fast it has been rising in recent years, make it easy to identify countries that are liable to face a future debt crisis. Using BIS data, Table 7 (on page 57) shows advanced economies in
descending order of their private debt to GDP ratios, and Table 9 repeats this for Emerging countries.

The only countries that are neither debt zombies nor potential victims are Germany amongst the advanced economies—for reasons that are both exemplary and ignoble, as I explain later—and Israel, Hungary, the Czech Republic, Poland, South Africa, India, Saudi Arabia, Indonesia, Mexico and Argentina amongst the emerging nations. Turkey, Russia and Brazil are borderline cases, since while their peak debt ratios are well below the danger zone, their rates of credit growth in recent years have been high, which makes them vulnerable to a deceleration in the rate of growth of private debt.

Richard Vague’s empirical indicators for past crises (a debt ratio above 150% of GDP and an increase in the ratio of 17% over the previous 5 years) imply 5 potential victims amongst the advanced nations—Switzerland, Canada, Belgium, Australia, and France. But given how extreme some of the debt levels are, I would add Sweden, Norway and Finland to that list. Austria is on the border, with a debt ratio level that ticked Vague’s level criterion, but a relatively low rate of debt increase prior to 2015. The Netherlands is also a candidate, but since it also has the characteristics of a Debt Zombie, it might be regarded as Schrödinger’s Zombie—alive and undead at the same time. Italy might also qualify as an honorary zombie, since its private debt change dynamics are negative, even though its peak debt level was well short of Vague’s 150% criterion.

For Emerging economies, the obvious candidates for a crisis are Hong Kong, China, and Korea, while Singapore, Malaysia and Thailand have part of the pre-requisites in a dramatic increase in debt over the last five years (42% for Singapore, 20% for Malaysia, and 31% for Thailand), and a very high rate of growth of debt in the past year (8% for Singapore, 15% for Malaysia and 7.5% for Thailand).

**Table 9: Emerging country private debt ratio levels and growth rates**

<table>
<thead>
<tr>
<th>Country</th>
<th>Debt Ratio</th>
<th>Change last 5 years</th>
<th>Debt Growth Last Year as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hong Kong</td>
<td>285%</td>
<td>64.1%</td>
<td>14.3%</td>
</tr>
<tr>
<td>China</td>
<td>205%</td>
<td>52.8%</td>
<td>27.0%</td>
</tr>
<tr>
<td>Korea</td>
<td>193%</td>
<td>16.2%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Singapore</td>
<td>147%</td>
<td>42.4%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>138%</td>
<td>20.2%</td>
<td>15.3%</td>
</tr>
<tr>
<td>Thailand</td>
<td>123%</td>
<td>30.6%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Israel</td>
<td>112%</td>
<td>-14.1%</td>
<td>2.1%</td>
</tr>
<tr>
<td>Hungary</td>
<td>109%</td>
<td>-27.2%</td>
<td>-2.2%</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>88%</td>
<td>5.4%</td>
<td>3.4%</td>
</tr>
<tr>
<td>Poland</td>
<td>84%</td>
<td>11.6%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Turkey</td>
<td>80%</td>
<td>33.0%</td>
<td>14.9%</td>
</tr>
<tr>
<td>Russia</td>
<td>79%</td>
<td>21.2%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Brazil</td>
<td>75%</td>
<td>21.5%</td>
<td>8.1%</td>
</tr>
<tr>
<td>South Africa</td>
<td>72%</td>
<td>0.7%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

---

39 I have left Luxembourg off the list, even though it has the highest recorded private debt level of all (383% of GDP), because its data series is too short and too volatile to be taken seriously.
All of these countries have become very highly dependent on credit—which means dependent on continued growth of private debt—to sustain current levels of demand and incomes. When that growth stops, their domestic demand will plummet, and their economies will enter recessions. And this will affect the rest of the world as well, since the part of their demand for imports which is credit-based will disappear. While none of these countries are as significant as America in terms of their percentage of global GDP, China alone is more than half the USA’s size, and collectively they are more significant share of global GDP than America.

Table 10: The Zombies-To-Be ranked by their significance as a percentage of global private debt

<table>
<thead>
<tr>
<th>Country</th>
<th>2015 GDP in US$</th>
<th>% of World Growth Rate</th>
<th>% of World % of GDP Growth rate last 5 years</th>
<th>2015 growth rate</th>
<th>Debt ratio growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$10,485</td>
<td>15.9% 6.8%</td>
<td>21.7% 205.2%</td>
<td>27.0%</td>
<td>15.1% 7.8%</td>
</tr>
<tr>
<td>France</td>
<td>$2,431</td>
<td>3.7% 2.0%</td>
<td>4.4% 181.0%</td>
<td>6.5%</td>
<td>2.1% 0.1%</td>
</tr>
<tr>
<td>Canada</td>
<td>$1,481</td>
<td>2.2% 1.7%</td>
<td>3.1% 207.4%</td>
<td>11.4%</td>
<td>6.6% 4.9%</td>
</tr>
<tr>
<td>Korea</td>
<td>$1,289</td>
<td>2.0% 4.5%</td>
<td>2.5% 193.2%</td>
<td>10.8%</td>
<td>7.9% 3.3%</td>
</tr>
<tr>
<td>Australia</td>
<td>$1,137</td>
<td>1.7% 1.4%</td>
<td>2.4% 206.2%</td>
<td>10.6%</td>
<td>8.1% 6.6%</td>
</tr>
<tr>
<td>Italy</td>
<td>$1,823</td>
<td>2.8% 0.8%</td>
<td>2.2% 122.0%</td>
<td>0.4%</td>
<td>-1.3% -2.1%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>$757</td>
<td>1.1% 2.5%</td>
<td>1.8% 236.8%</td>
<td>2.5%</td>
<td>3.2% 0.7%</td>
</tr>
<tr>
<td>Switzerland</td>
<td>$659</td>
<td>1.0% 0.2%</td>
<td>1.4% 210.1%</td>
<td>6.2%</td>
<td>1.3% 1.1%</td>
</tr>
<tr>
<td>Sweden</td>
<td>$487</td>
<td>0.7% 5.4%</td>
<td>1.2% 236.6%</td>
<td>8.7%</td>
<td>6.7% 1.3%</td>
</tr>
<tr>
<td>Belgium</td>
<td>$456</td>
<td>0.7% 2.1%</td>
<td>1.0% 207.0%</td>
<td>7.0%</td>
<td>4.0% 1.9%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>$306</td>
<td>0.5% 6.3%</td>
<td>0.9% 285.2%</td>
<td>31.5%</td>
<td>5.3% -1.0%</td>
</tr>
<tr>
<td>Norway</td>
<td>$371</td>
<td>0.6% 0.2%</td>
<td>0.9% 233.2%</td>
<td>10.9%</td>
<td>6.5% 3.7%</td>
</tr>
<tr>
<td>Austria</td>
<td>$376</td>
<td>0.6% 2.1%</td>
<td>0.6% 148.2%</td>
<td>4.3%</td>
<td>3.5% 1.4%</td>
</tr>
<tr>
<td>Thailand</td>
<td>$353</td>
<td>0.5% 2.7%</td>
<td>0.5% 122.7%</td>
<td>10.9%</td>
<td>6.5% 3.7%</td>
</tr>
<tr>
<td>Finland</td>
<td>$231</td>
<td>0.4% 0.6%</td>
<td>0.4% 179.4%</td>
<td>6.0%</td>
<td>2.3% 1.6%</td>
</tr>
</tbody>
</table>
Singapore | $235 | 0.4% | 1.9% | 0.4% | 146.7% | 13.6% | 5.8% | 3.8%
Malaysia | $257 | 0.4% | 4.7% | 0.4% | 138.5% | 11.8% | 12.4% | 7.3%
Total | 35.1% | 45.7% 

China alone accounts for 16% of global GDP\textsuperscript{40} and 22% of global private debt, so its crisis will have a significant impact on the rest of the world. Together, these 17 vulnerable countries account for 35% of global GDP, versus 29% for the USA, and 46% of global private debt, versus 32% for the USA at the time of the GFC. Though the whole group will not experience a crisis at the same time, their transition from debt-driven boom economies to additional members of the private debt zombies club will throw them into recession, and slow down growth in the already moribund zombie economies.

Table 11: USA significance now and at the time of its crisis (the GFC)

<table>
<thead>
<tr>
<th>USA</th>
<th>GDP as % of world total</th>
<th>Private Debt as % of world total</th>
<th>GDP Growth rate</th>
<th>Private debt growth rate</th>
<th>Credit growth rate as % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value at time of GFC</td>
<td>29.0%</td>
<td>31.8%</td>
<td>4.7%</td>
<td>9.7%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Value now</td>
<td>27.6%</td>
<td>27.0%</td>
<td>3.0%</td>
<td>4.4%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

The biggest—and the most interesting—of the potential Zombies is of course China.

A Stumble on the Capitalist Road

Any criticism of China’s current economic situation has to be tempered by an acknowledgement of its extraordinary economic success over the past 30 years. The abandonment of China’s socialist experiment, and the adoption of the “Capitalist Road” under Deng Xiaoping, transformed China from a country of genteel peasant poverty into a vibrant industrialised economy. I was fortunate to visit China at the very start of its transformation back in 1981/82, when I organised a seminar between Australian and Chinese journalists on behalf of the Australia-China Council (see Figure 38). In the tour after the seminar, we visited the Shenzhen Free Trade Zone when the Australian company CSR was still laying the concrete for its early factories, and the Zone’s management was happy to promote the Zone by explaining their growth strategy to us.

Of course this relied on exploiting the enormous wage differential between Chinese and Western workers, but this was no different to the strategy of Free Trade Zones in the rest of Asia, where they were already commonplace. What was different about Shenzhen was the requirement that these Western companies had to have a Chinese partner, and that 50% of the ownership of the business had to be transferred to the Chinese partner within the first 5 years. The Chinese were intent on developing a capitalist class, and of ensuring that knowledge of Western technology was transferred to Chinese businessmen and engineers. The Australian journalists and I were sceptical of many other aspects of China’s attempt to modernise, but we all agreed that this approach was going to work.

\textsuperscript{40} Where “global” means the combined GDPs (in US$ terms) of the 41 countries in the BIS database.
And work it did. China grew rapidly as it employed advanced Western technology in its export-oriented factories, as peasants were transformed into industrial workers, and as investment in further expansion was promoted over consumption. The standard of living of the majority of its people has risen dramatically over the last 30 years as a result, and the problems China faces now are those of too much success, rather than failure.

The challenge to China’s growth strategy came when the credit engine that had fuelled Western growth died.
Figure 39: China nominal GDP growth

Figure 40: China credit and GDP
A simple—but unlikely—way to free the Zombies

A tragic—but likely—economic future