Instability in Financial Markets: Sources and Remedies

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Introduction

In the seemingly never-ending aftermath to the economic crisis that began in 2007, there is little disagreement that financial markets are characterized by instability rather than stability. Even Eugene Fama, the most influential proponent of the Capital Assets Pricing Model (CAPM; Fama 1970), now acknowledges that *CAPM* is strongly contradicted by the data:

> The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is poor—poor enough to invalidate the way it is used in applications… whether the model's problems reflect weaknesses in the theory or in its empirical implementation, the failure of the CAPM in empirical tests implies that most applications of the model are invalid. (Fama and French 2004, p. 25)

CAPM's empirical demise as a theory of finance has been accompanied by the rise of behavioural finance, which attributes much of the instability of finance markets to the limited and heuristically oriented cognitive capacities of actual traders (Kahneman and Tversky 1979; Kahneman 2003). While this is clearly an important aspect of instability, I will take a different tack and situate my explanation in the integrated macro-financial vision of Hyman Minsky's Financial Instability Hypothesis (*FIH*). Previous papers have applied Minsky's vision to macroeconomics (Keen 1995; Keen 1997; Keen 2000; Keen 2011); in this paper I will focus on the implications of Minsky's analysis for the behaviour of financial markets.

A lengthy prelude is necessary before I consider Minsky's analysis of financial markets, since past experience has shown that a neoclassical perspective on economics (which the vast majority of policy makers have, as well as most economists) obstructs comprehension of the link Minsky postulates between debt and asset prices.

A Primer on Minsky

Minsky enjoyed a strong following amongst Post Keynesian economists, but he was almost completely ignored by neoclassical economists before the crisis. Bernanke's treatment of him is not atypical:

> 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 behaviour… [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, p. 43)

Now, after the crisis that his theory anticipated, neoclassical economists are paying some attention to his hypothesis, and there has been at least one attempt to build a New Keynesian model of a key phenomenon in Minsky's hypothesis, a debt-deflation (Krugman and Eggertsson 2010). However, to

those of us who are not new to Minsky, it is hard to recognise any vestige of the Financial Instability Hypothesis in Krugman's work. This reaction is based not merely on Minsky's explicit denial that his hypothesis could be modelled from a neoclassical perspective (Minsky 1982 , p. 5),[1] but on ways in which it is strictly incompatible with New Keynesian methodology. There are many facets to this, but I will focus on two that are crucial to the link between the *FIH* and financial market instability: disequilibrium and endogenous money.

Disequilibrium

Minsky precursors Schumpeter and Fisher accepted that capitalism was always in disequilibrium. Schumpeter saw instability as intrinsic to capitalism, and regarded it as not a flaw, but as the source of capitalism's vitality (Schumpeter 1928). Fisher, as an apostate from neoclassical equilibrium modelling after the Great Depression ruined him, put the necessity for disequilibrium modelling very clearly—even for those who believe that capitalism is fundamentally stable. Fisher argued that, even if a tendency towards equilibrium is assumed, as a matter of fact, all economic variables will be in disequilibrium at all times in the real economy. Economics theory therefore must be disequilibrium in nature:

> 'We may tentatively assume that, ordinarily and within wide limits, all, or almost all, economic variables tend, in a general way, toward a stable equilibrium... But … New disturbances are, humanly speaking, sure to occur, so that, in actual fact, any variable is almost always above or below the ideal equilibrium...
> Theoretically there may be—in fact, at most times there must be—over-or under-production, over- or under-consumption, over- or under-spending, over- or under-saving, over- or under-investment, and over or under everything else. *It is as absurd to assume that, for any long period of time, the variables in the economic organization, or any part of them, will "stay put," in perfect equilibrium, as to assume that the Atlantic Ocean can ever be without a wave.'* (Fisher 1933, p. 339; emphasis added)

Minsky went further than Schumpeter and Fisher to argue that equilibrium itself was inherently unstable, and contained the seeds of disaster as well as of bounty. Because stability was the exception rather than the norm in a capitalist economy, any period of stability will have been preceded by a more turbulent time; and because the future was uncertain, a period of tranquillity would lead to capitalists revising their expectations upwards:

> Stable growth is inconsistent with the manner in which investment is determined in an economy in which debt-financed ownership of capital assets exists, and the extent to which such debt financing can be carried is market determined. It follows 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 1982, p. 67)

Minsky's classic phrase that "Stability … is destabilizing" (Minsky 1982, p. 101) encapsulates his cyclical vision of capitalism.[2] Any attempt to shoehorn this into the comparative static, shifting equilibrium methodology of New Keynesian macroeconomics is certain to caricature his analysis rather than do it justice.

Endogenous Money

Banks play a crucial role in Minsky's analysis because they can endogenously expand the money supply in response to entrepreneurial or Ponzi Finance demands for funds. This emphasis upon the crucial role of banks can be traced back to Minsky's PhD advisor Schumpeter, who argued that investment is **not** financed by savings, but by the endogenous expansion of the money supply by banks:

> Even though the conventional answer to our question is not obviously absurd, yet there is another method of obtaining money for this purpose, which … does not presuppose the existence of accumulated results of previous development, and hence may be considered as the only one which is available in strict logic. This method of obtaining money is the creation of purchasing power by banks… It is always a question, not of transforming purchasing power which already exists in someone's possession, but of the creation of new purchasing power out of nothing. (Schumpeter 1934, p. 73)

Schumpeter thus saw investment as being primarily financed not out of income, but out of the increase in the money supply caused by banks issuing loans to entrepreneurs—where this increase in the money supply was exactly matched by and caused by an increase in debt.

Schumpeter's entirely theoretical arguments on both the nature of banking and the ultimate source of finance for investment received subsequent support from empirical researchers. Basil Moore (Moore 1979; Minsky, Nell et al. 1991) overturned the "money multiplier" model of money creation with empirical research which showed that bank lending preceded reserve creation (see also Holmes 1969; Carpenter and Demiralp 2010).[3] Fama and French concluded that correlations they found between investment and the change in corporate debt levels "confirm the impression that debt plays a key role in accommodating year-by-year variation in investment." (Fama and French 1999, p. 1954)[4]

However, rising debt does not only finance investment: it also finances speculation. Enter Minsky, who extended Schumpeter by considering the demands of Ponzi Financiers as well. These borrowers do not invest, but buy existing assets and hope to profit by selling those assets on a rising market. Therefore, unlike Schumpeter's entrepreneurs, whose debts today can be serviced and repaid from profits tomorrow, Ponzi Financiers always have debt servicing costs that exceed the cash flows from the assets they purchased with borrowed money. They therefore *must* expand their debts or sell assets to continue functioning:

> A Ponzi finance unit is a speculative financing unit for which the income component of the near term cash flows falls short of the near term interest payments on debt so that for some time in the future the outstanding debt will grow due to interest on existing debt… Ponzi units can fulfil their payment commitments on debts only by borrowing (or disposing of assets)… a Ponzi unit must increase its outstanding debts. (Minsky 1982, p. 24)

Schumpeter and Minsky both saw credit money created by the banking system as the source of the aggregate demand in excess of income. Minsky put this explicitly:

> If income is to grow, the financial markets, where the various plans to save and invest are reconciled, must generate an aggregate demand that, aside from brief intervals, is ever rising. *For real aggregate demand to be increasing, . . . it is necessary that current spending plans, summed over all sectors, be greater than current received income* and that some market technique exist by which aggregate spending in excess of aggregate anticipated income can be financed. *It follows that over a period during which economic growth takes place, at least some sectors finance a part of their spending by emitting debt* or selling assets. (Minsky 1963; Minsky 1982) (Minsky 1982, p. 6; emphasis added)

This endogenous money perspective thus transcends Walras' Law, which plays such a key role in Neoclassical equilibrium modelling but is valid only in an economy without banks. In a credit economy, a dynamic disequilibrium "Walras-Schumpeter-Minsky's Law" applies instead: *aggregate demand is income plus the change in debt, and this is expended on both goods and services and*

financial assets. Therefore in a credit-based economy, there are three sources of aggregate demand, and three ways in which this demand is expended:

1. Demand from income earned by selling goods and services, which primarily finances consumption of goods and services;
2. Demand from rising entrepreneurial debt, which primarily finances investment; and
3. Demand from rising Ponzi debt, which primarily finances the purchase of existing assets.

Neoclassical misinterpretations of Fisher, Minsky & Banking

The endogenous creation of money by banks means that the level and rate of change of private debt play crucial roles in Minsky's macroeconomics. In contrast, neoclassical theory treats banks as mere intermediaries between savers and borrowers, formally ignores them in DSGE modelling, and treats the level and rate of change of private debt as macroeconomically unimportant. Before the crisis, Bernanke dismissed Fisher's debt-deflation explanation for the Great Depression:

> 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. (Bernanke 2000, p. 24)

Even after the crisis, when private debt had to be acknowledged as a factor, neoclassical modellers insisted that the aggregate level of debt was unimportant—only its distribution could matter:

> Ignoring the foreign component, or looking at the world as a whole, the overall level of debt makes no difference to aggregate net worth -- one person's liability is another person's asset…
> In what follows, we begin by setting out a flexible-price endowment model in which "impatient" agents borrow from "patient" agents, but are subject to a debt limit. If this debt limit is, for some reason, suddenly reduced, the impatient agents are forced to cut spending… (Krugman and Eggertsson 2010, p. 3)

Krugman reasserted this analysis in a recent blog, arguing that the level of debt doesn't matter, because debt is "money we owe to ourselves":

> People think of debt's role in the economy as if it were the same as what debt means for an individual: there's a lot of money you have to pay to someone else. But that's all wrong; the debt we create is basically money we owe to ourselves, and the burden it imposes does not involve a real transfer of resources.
> That's not to say that high debt can't cause problems — it certainly can. But these are problems of distribution and incentives, not the burden of debt as is commonly understood. (Krugman 2011)[5]

The flaw in this neoclassical approach to debt and banking is easily illustrated using bookkeeping tables.[6] In the following two tables, transactions are shown from the bank's point of view, so that crediting an account by an increase in deposits is shown as a negative (since deposits are a liability for the bank) and debiting an account by an increase in debt is shown as a positive (since loans are an asset). The neoclassical vision of saving as modelled by Krugman (after inserting an implicit banking sector into Krugman's bank-less model) is shown in Table 1. From this perspective, lending makes no difference to the level of aggregate demand (unless the impatient agent has a markedly higher propensity to spend) because lending does not change the amount of money in circulation—it only alters its distribution.

Table 1: Neoclassical perspective on lending

	Assets	Deposits (Liabilities)	
Action/Actor		Patient	Impatient
Make Loan		+Lend	-Lend

The endogenous money vision is shown in Table 2. From this perspective, lending increases the amount of money in circulation, and adds to the spending power of the "Impatient agent" (in practice, normally either an investor or a Ponzi speculator) *without* subtracting from the spending power of the "Patient agent". Aggregate demand therefore rises by the increase in debt.

Table 2: Endogenous money perspective on lending

	Bank Assets	Bank Deposits (Liabilities)	
Action/Actor		Patient	Impatient
Make Loan	+Lend		-Lend

Table 2 is not only more faithful to Minsky's vision: it is also more realistic. Real world lending is **not** a transfer of money from one depositor's account to another's, but a contract between a bank and a borrower in which the bank credits the borrower's account (thus increasing the bank's liabilities)[7] in return for the borrower agreeing to be in debt to the bank for the same amount (thus increasing the bank's assets).[8] This increases the aggregate amount of money in circulation, increasing aggregate demand in the process—and predominantly financing investment or speculation rather than consumption. Contrary to neoclassical *a priori* logic, the level of private debt has serious macroeconomic effects, and plays a dominant role in setting asset prices.

The primary focus of this paper is the latter, but given the extent to which macroeconomics and finance are intertwined in Minsky's work, I would be remiss not to cover his integrated vision of financial macroeconomics. The next section is an abridged extract from Keen (1995).

Minsky on Debt-driven booms and busts

Minsky's analysis of a financial cycle begins at a time when the economy is doing well, but firms are conservative in their portfolio management, and this conservatism is shared by banks. The cause of this high and universally practiced risk aversion is the memory of a not too distant system-wide financial failure, when many investment projects foundered, many firms could not finance their borrowings, and many banks had to write off bad debts. Because of this recent experience, both sides of the borrowing relationship prefer extremely conservative estimates of prospective cash flows: their risk premiums are very high.

However, the combination of a growing economy and conservatively financed investments means that most projects succeed. Two things gradually become evident to managers and bankers: "Existing debts are easily validated and units that were heavily in debt prospered: it pays to lever" (Minsky 1982, p. 65). As a result, both managers and bankers come to regard the previously accepted risk premium as excessive. Investment projects are evaluated using less conservative estimates of prospective cash flows, so that with these rising expectations go rising investment and asset prices. The general decline in risk aversion thus sets off both growth in investment and exponential growth in the price level of assets, which is the foundation of both the boom and its eventual collapse.

More external finance is needed to fund the increased level of investment and the speculative purchase of assets, and these external funds are forthcoming because the banking sector shares the increased optimism of investors. The accepted debt to equity ratio rises, liquidity decreases, and the growth of credit accelerates.

This marks the beginning of what Minsky calls "the euphoric economy" (Minsky 1982, pp. 120-124), where both lenders and borrowers believe that the future is assured, and therefore that most

investments will succeed. Asset prices are revalued upward and financial institutions now accept liability structures for both themselves and their customers "that, in a more sober expectational climate, they would have rejected" (Minsky 1982, p. 123). The liquidity of firms is simultaneously reduced by the rise in debt to equity ratios, making firms more susceptible to increased interest rates. The general decrease in liquidity and the rise in interest paid on highly liquid instruments triggers a market-based increase in the interest rate, even without any attempt by monetary authorities to control the boom. However, the increased cost of credit does little to temper the boom, since anticipated yields from speculative investments normally far exceed prevailing interest rates, leading to a decline in the elasticity of demand for credit with respect to interest rates.

The condition of euphoria also permits the development of an important actor in Minsky's drama, the Ponzi financier (Minsky 1982, pp. 70, 115). These capitalists profit by trading assets on a rising market, and incur significant debt in the process. The servicing costs for Ponzi debtors exceed the cash flows of the businesses they own, but the capital appreciation they anticipate far exceeds the interest bill. They therefore play an important role in pushing up the market interest rate, and an equally important role in increasing the fragility of the system to a reversal in the growth of asset values.

Rising interest rates and increasing debt to equity ratios eventually affect the viability of many business activities, reducing the interest rate cover, turning projects that were originally conservatively funded into speculative ones, and making ones that were speculative "Ponzi." Such businesses will find themselves having to sell assets to finance their debt servicing—and this entry of new sellers into the market for assets pricks the exponential growth of asset prices. With the price boom checked, Ponzi financiers now find themselves with assets that can no longer be traded at a profit, and levels of debt that cannot be serviced from the cash flows of the businesses they now control. Banks that financed these assets purchases now find that their leading customers can no longer pay their debts—and this realization leads initially to a further bank-driven increase in interest rates. Liquidity is suddenly much more highly prized; holders of illiquid assets attempt to sell them in return for liquidity. The asset market becomes flooded and the euphoria becomes a panic, the boom becomes a slump.

As the boom collapses, the fundamental problem facing the economy is one of excessive divergence between the debts incurred to purchase assets, and the cash flows generated by them—with those cash flows depending upon both the level of investment and the rate of inflation.

The level of investment has collapsed in the aftermath of the boom, leaving only two forces that can bring asset prices and cash flows back into harmony: asset price deflation, or current price inflation. This dilemma is the foundation of Minsky's iconoclastic perception of the role of inflation, and his explanation for the stagflation of the 1970s and early 1980s.

Minsky argues that if the rate of inflation is high at the time of the crisis or the debt level is relatively low, then though the collapse of the boom causes investment to slump and economic growth to falter, rising cash flows rapidly enable the repayment of debt incurred during the boom. The economy can thus emerge from the crisis with diminished growth and high inflation, but few bankruptcies and a sustained decrease in liquidity. Thus, though this course involves the twin "bads" of inflation and initially low growth, it is a self-correcting mechanism in that a prolonged slump is avoided.

However, the conditions are soon re-established for the cycle to repeat itself, and the avoidance of a true calamity is likely to lead to a secular decrease in liquidity preference. A secular trend toward rising debt to equity ratios develops, as each new cycle begins before all debt accumulated in the last cycle had been repaid. Colloquially, firms borrow during a boom and repay during a slump,

which gives the debt to income ratio a tendency to ratchet up over time, making the system more fragile.

If the rate of inflation is low at the time of the crisis and debt levels are very high, then cash flows will remain inadequate relative to the debt structures in place. Firms whose interest bills exceed their cash flows will be forced to undertake extreme measures: they will have to sell assets, attempt to increase their cash flows (at the expense of their competitors) by cutting their margins, or go bankrupt. In contrast to the inflationary course, all three classes of action tend to further depress the current price level, thus at least partially exacerbating the original imbalance. The asset price deflation route is, therefore, not self-correcting but rather self-reinforcing, and is Minsky's explanation of a depression.

The above basically describes Minsky's perception of an economy in the absence of a government sector. With big government, the picture changes in two ways, because of fiscal deficits and Reserve Bank interventions. The collapse in cash flows that occurs when a boom becomes a panic is at least partly ameliorated by a rise in government spending—the classic "automatic stabilizers," though this time seen in a more monetary light. (Keen 1995, pp. 611-614)

That's the theory: how well does it stack up against the data? Firstly, the level of private debt has certainly displayed the secular trend that Minsky identified (see Figure 1).

Figure 1: Aggregate Private and Public Debt

US Debt to GDP
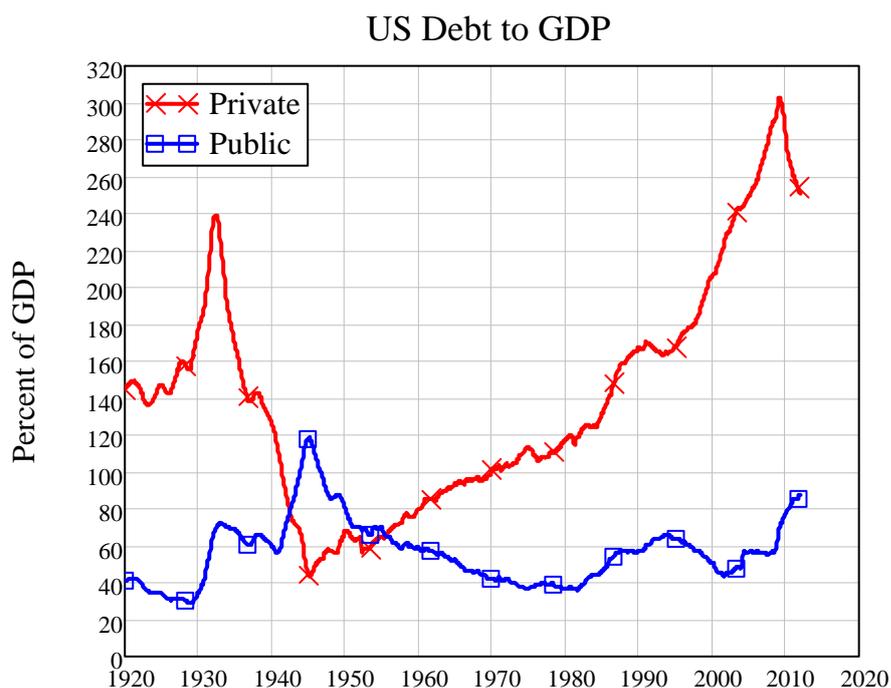
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Secondly, Minsky's verbal model of the cycle also focused primarily on the borrowing behaviour of the non-financial business sector, and here the cyclicality he predicted is also obvious. But overlaid on top of it is an exponential rise in finance sector debt, as Ponzi Finance became the diseased backbone of the US economy.

Figure 2: Private Debt by Sector

Debt to GDP by Sector
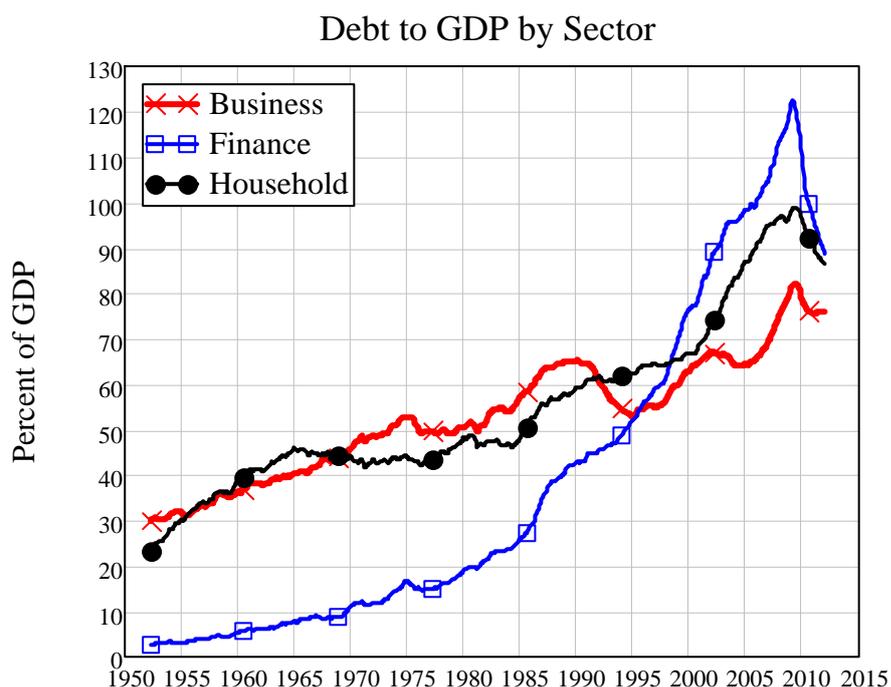
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Finally, the Minskian dynamics of debt also explain what neoclassical analysis will always find perplexing: the sudden transition from The Great Moderation to The Great Contraction (Rogoff 2011).

Applying Minsky to Macroeconomic Data

The Walras-Schumpeter-Minsky proposition that aggregate demand is income plus the change in debt, and that this is expended on both goods and services and purchases of financial claims on existing assets, can be put into a simple equation (with *Y* and *D* standing for nominal income and debt levels, *GDP* for the nominal value of output and *NAT* standing for "Net Asset Turnover"):

$$Y(t) + \frac{d}{dt} D(t) = GDP(t) + NAT(t) \tag{1.1}$$

Net Asset Turnover can be factored into the price index for assets P_A, times their quantity Q_A, times the annual turnover T_A expressed as a fraction of the number of assets $(T_A < 1)$:

$$NAT = P_A \cdot Q_A \cdot T_A \tag{1.2}$$

There will thus be a relationship between change in debt and the level of both economic activity and asset prices.

Focusing on the former for now, it is easily shown that the Great Moderation was driven by a substantial rise in debt-financed aggregate demand, while the Great Contraction coincided with a dramatic reversal from rising to falling debt.

Figure 3: Aggregate demand as income plus change in debt

US Aggregate Demand 1980-2012


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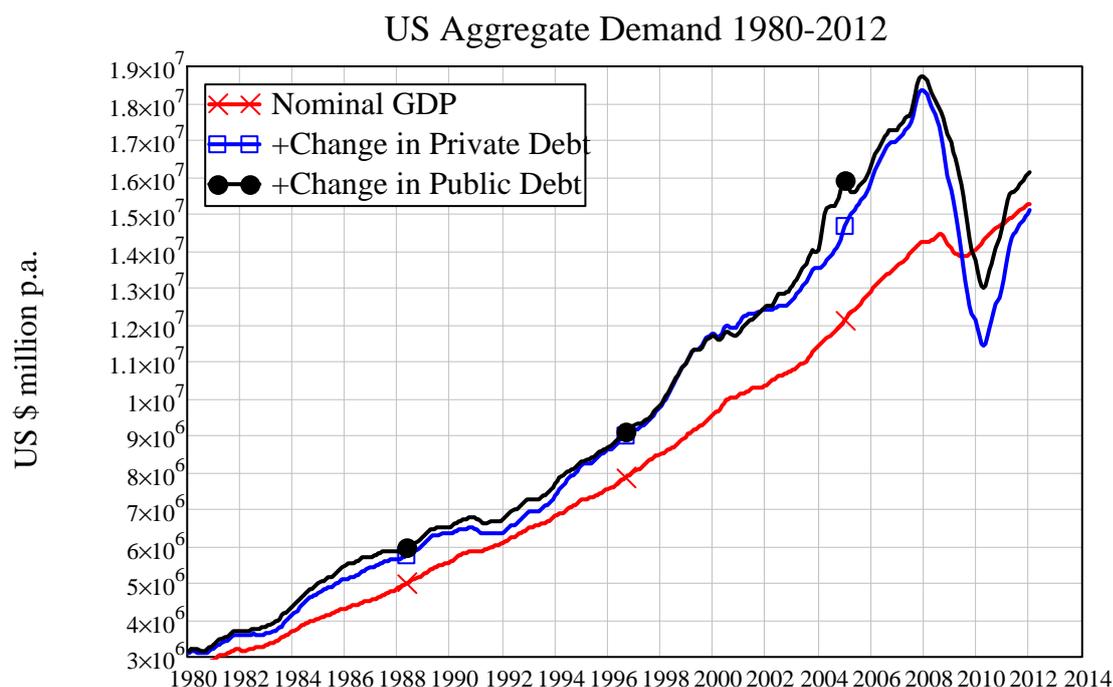
Similarly, when the rate of change of aggregate demand is considered, there is a relationship between the acceleration of debt and both the rate of change of GDP (Biggs and Mayer 2010; Biggs, Mayer et al. 2010) and the change in asset prices:[9]

$$\frac{d}{dt}Y + \frac{d^2}{dt^2}D = \frac{d}{dt}GDP + \frac{d}{dt}\left(P_A \cdot Q_A \cdot T_A\right) \tag{1.3}$$

The relationship between the "Credit Accelerator"—defined, following (Biggs and Mayer 2010; Biggs, Mayer et al. 2010) as the rate of change of the rate of change in debt per annum, divided by GDP at the midpoint—and change in the employment rate is shown in Figure 4. Far from aggregate debt not being macroeconomically important, change in employment is strongly correlated with the acceleration of debt.

Figure 4: Credit Acceleration and change in employment

Credit Acceleration & Employment Change (Corr=0.69)

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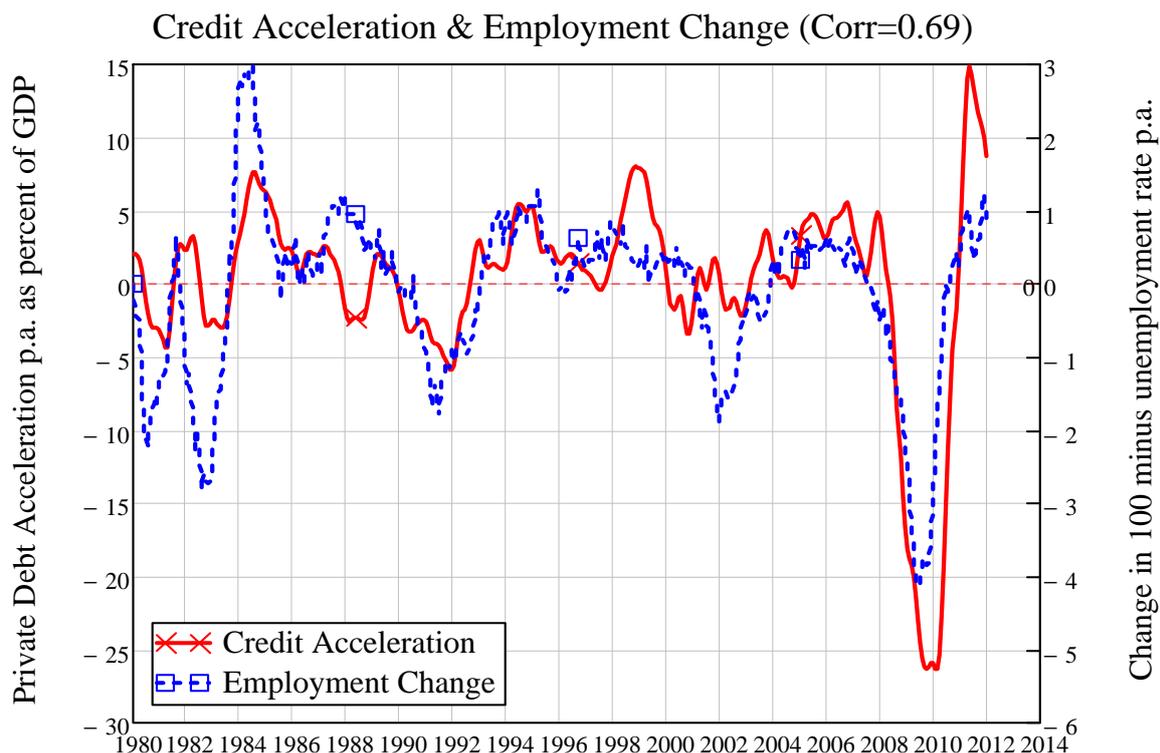
The scale and timing of the downturn is much easier to comprehend from Minsky's credit-based perspective than the income-only perspective of neoclassical economics. The downturn in GDP was relatively minor—from $14.4 trillion at its peak to $13.9 trillion at its lowpoint, a fall of just over half a trillion or 4% of nominal GDP—and it commenced late (in July 2008) and finished early (in May 2009) compared to the crisis itself, which is generally regarded as having started in August 2007 and continued getting worse in macroeconomic terms until late 2009.[10]

The downturn in private aggregate demand was much more severe: from $18.4 trillion at its peak in November 2007 to $11.4 trillion in February 2010, a fall of $6.9 trillion or 38% over 2.3 years. The deceleration of debt was 5 times greater than any other deceleration in the entire post-WWII period, and even stronger than in the Great Depression itself, when the maximum negative value of the Credit Accelerator was -18% of GDP.

The profound effect of the crisis not only on employment and GDP, but also on asset markets, is now far easier to comprehend.

This now brings us to Minsky's distinctive argument that there are (at least) two price levels in capitalism—one for commodities and the other for capital assets—and his analysis of the financial dynamics that can wedge them apart during speculative bubbles.
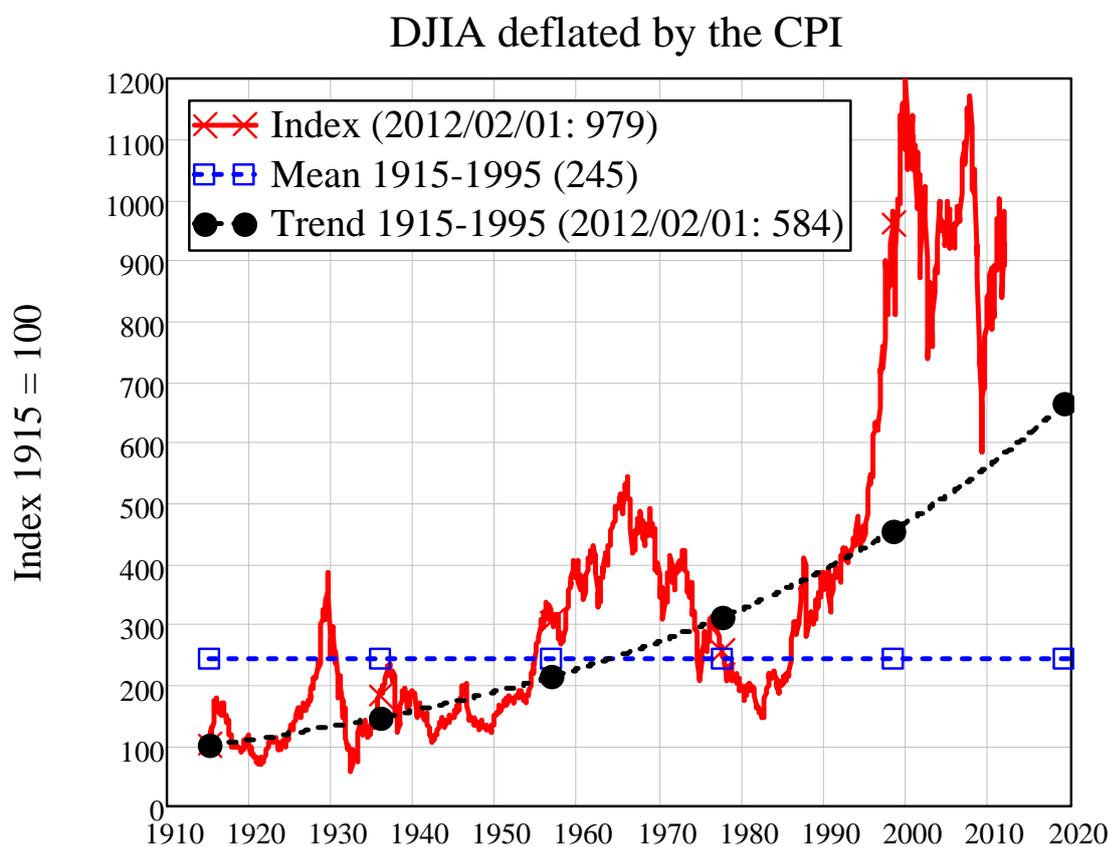

Minsky on Finance: Two Price Levels

As a Post Keynesian, Minsky argued that the prices of most end-consumer commodities are set by a markup on prime cost (Reynolds 1987; Blinder 1998; Lee 1998).[11] He portrayed changes in the price level for "current goods" as mainly a consequence of cost pressures (largely from wages and raw materials) and changes to markups. The largely independent price level of assets is based, not on the original cost of production of the assets, but on the net present value of anticipated cash flows. These in turn depend on the general state of expectations, which vary systematically over the

financial cycle, lagging behind current prices in a slump, running ahead of them in a recovery and boom, and are financed largely by Ponzi borrowing. This perspective allows for significant divergence between the two price levels as expectations rise and fall over the medium term, and as the growth of debt that finances Ponzi activity in asset markets rises and falls with them. However over the very long term, asset prices must eventually return to some kind of harmony with current prices, since the only sustainable support for asset prices is the sales of the commodities they produce. The price system thus displays far-from-equilibrium dynamics, according to Minsky, in contrast to the neoclassical argument that the price system is a stabilising force in a capitalist economy.

This implies that a simple comparison of asset prices to consumer prices can identify bubbles, since Minsky saw no reason for a long-term trend for the asset to consumer price ratio to rise over time—the only basis for this would be the capitalization of income streams generated by assets into asset prices. This is feasible with share prices, given retained earnings and in particular the zero-dividend policies of firms like Berkshire-Hathaway, but not with house prices.

Even given the existence of a trend to the real share price, the commencement of the "Great Moderation" share price bubble in 1995 is obvious (see Figure 5).
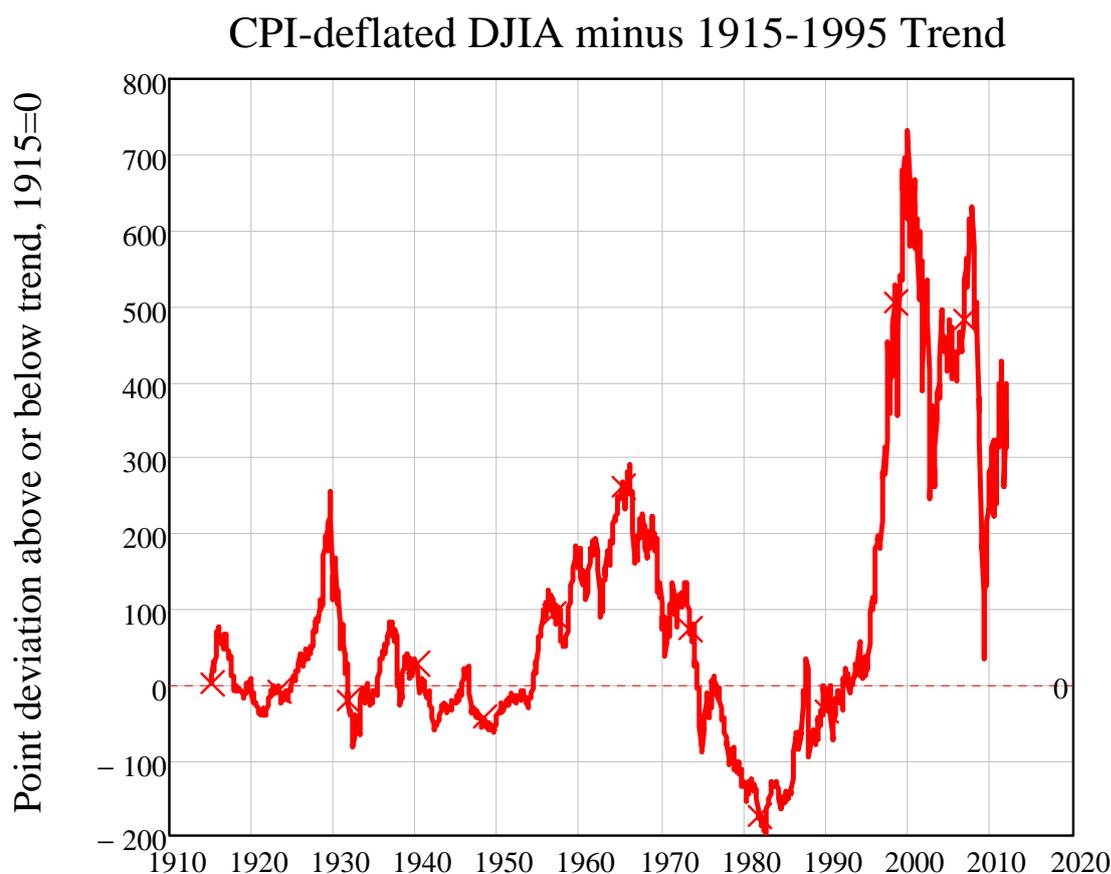
Figure 5: Two price levels (shares)

Figure 6 subtracts the trend from 1915 till 1995 from the data.

Figure 6: DJIA minus exponential trend 1915-1995

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The role of the acceleration of debt in driving these asset price bubbles is evident. Equation (1.3) casts the role of speculation on asset prices in a far different light than does neoclassical economics, which sees speculation as aiding in price discovery (Schwartz, Wolf et al. 2010). Instead, leveraged speculation plays a dominant role in price formation—leading to the development of debt-financed bubbles in asset prices.

The equation as stated ignores the feedback relations between income and output and change in debt, but even then it indicates that the impact of the acceleration in debt will be dispersed through at least five highly aggregated variables.[12] Clearly behavioural sentiment issues will also affect how much debt is levered into asset markets versus parked elsewhere. Nonetheless significant correlations exist between debt acceleration and real share prices (see **Error! Reference source not found.** and Figure 8), and especially between acceleration of mortgage debt and change in real house prices (see Figure 10).

Figure 7 shows the correlation of the deviations from trend with the acceleration of private credit during the Roaring Twenties and the Great Depression (lagged one year since the pre-1950 debt data is end-of-year annual only).

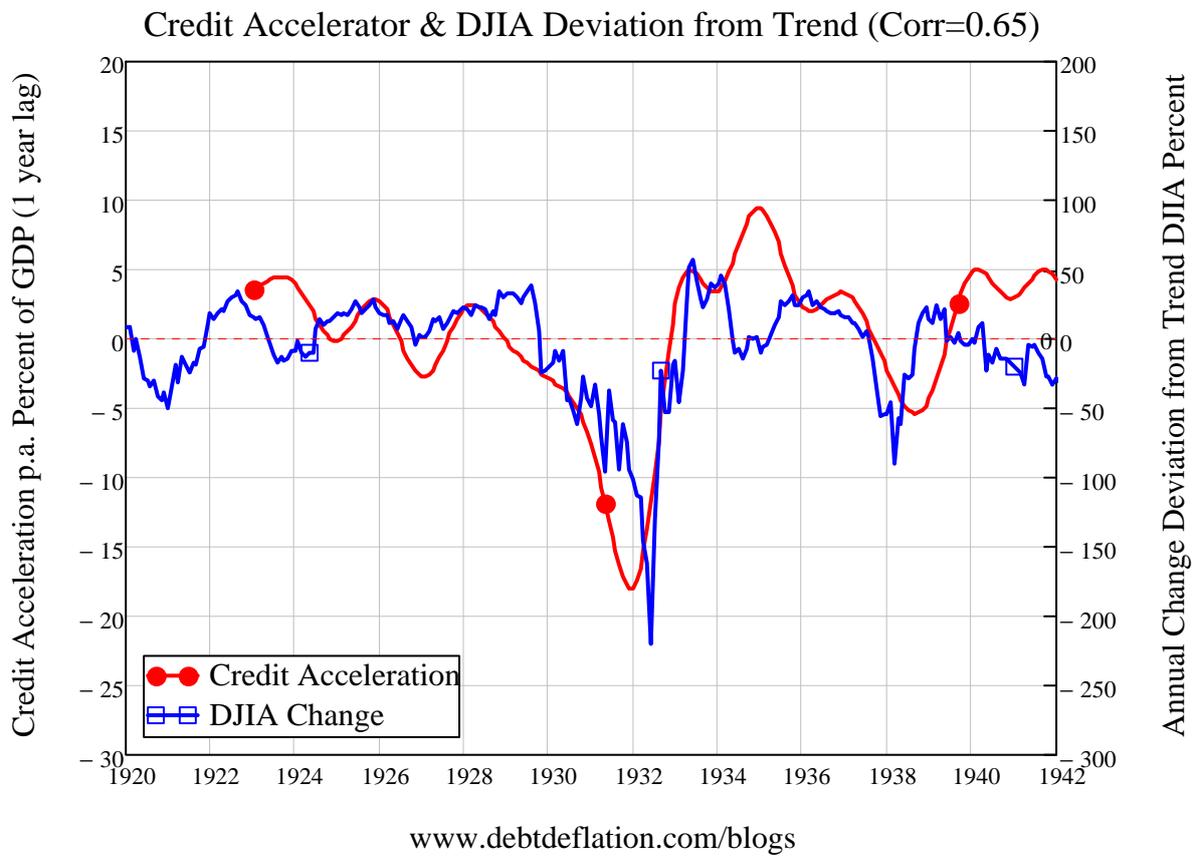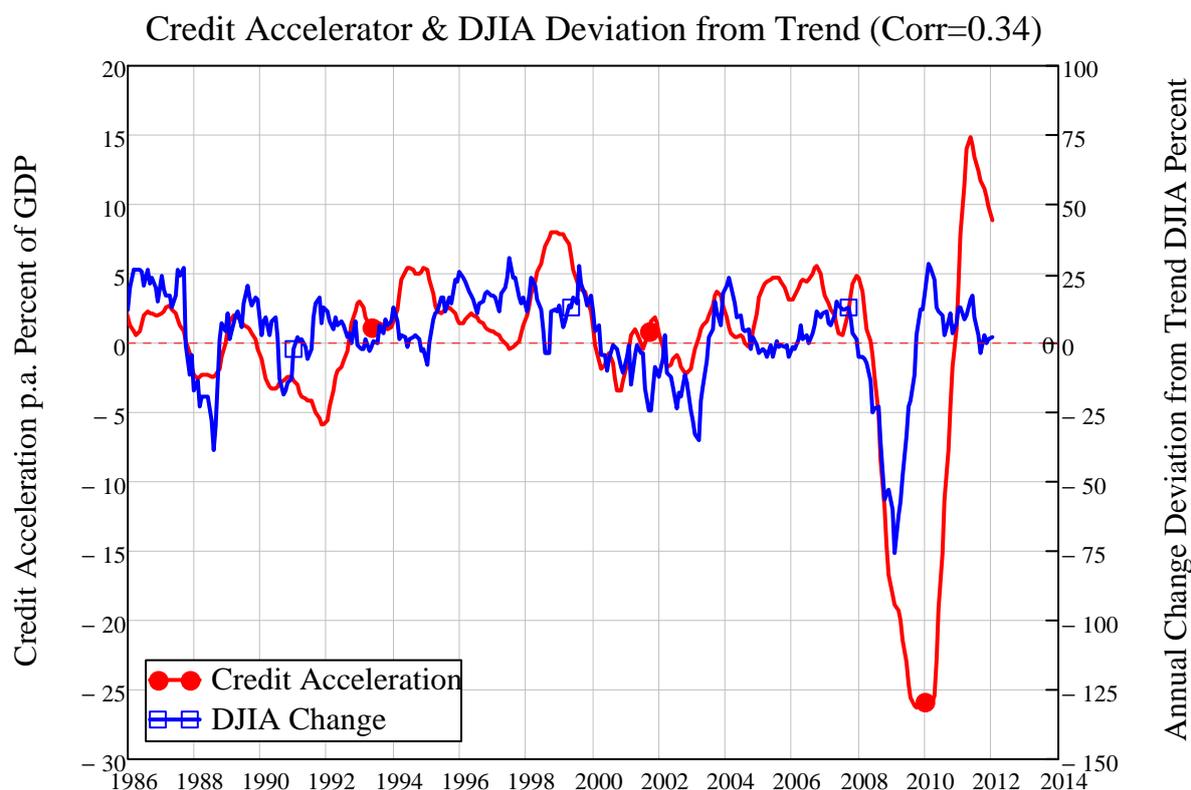**Figure 7: Credit Acceleration and share price movements 1922-1942**

Credit Accelerator & DJIA Deviation from Trend (Corr=0.65)

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Figure 8 shows the same relationship from 1986 till today.

Figure 8: Credit Acceleration and share price movements 1986-Now

Credit Accelerator & DJIA Deviation from Trend (Corr=0.34)
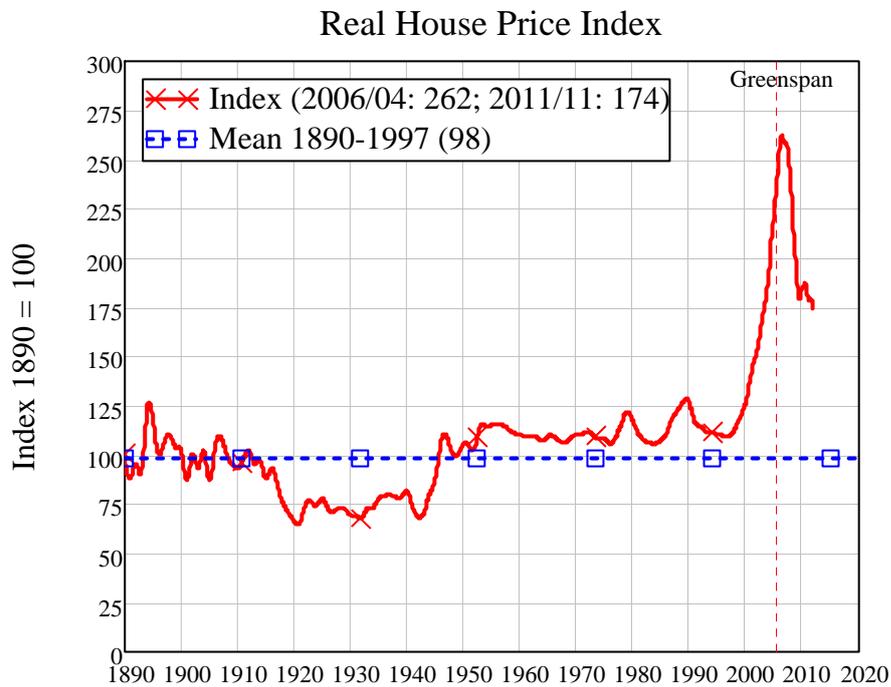
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The relationship between the change in house prices and the acceleration of debt since 1990 are more easily identified, for three reasons. Firstly, there is no need to subtract any trend in real house prices prior to the bubble, since there is no reason to expect a trend, and the empirical data confirms that there was none. Secondly, there is a specific subset of debt—mortgage debt—whose acceleration can be directly be compared to change in real house prices. While some mortgage debt bleeds into expenditure on other items (especially with "mortgage equity withdrawal" loans) and into expanding the stock of housing, the majority of mortgage debt goes into purchasing existing housing.

 Thirdly, this was the first truly major house price bubble in America's history. Minor bubbles are evident in 1895, 1979 and 1990, but they are mere Catskills compared to the Everest of the 2006 bubble. The Subprime Bubble clearly began in 1997 (see Figure 9), and burst nine years later. With this data readily available since 2000 (Shiller 2000), it beggars belief that, just 10 months before the peak, Greenspan could assert to Congress that there was no national housing bubble, and that any house price declines would "not have substantial macroeconomic implications":

> That said, there can be little doubt that exceptionally low interest rates on ten-year Treasury notes, and hence on home mortgages, have been a major factor in the recent surge of homebuilding and home turnover, and especially in the steep climb in home prices. Although a "bubble" in home prices for the nation as a whole does not appear likely, there do appear to be, at a minimum, signs of froth in some local markets where home prices seem to have risen to unsustainable levels… Although we certainly cannot rule out home price declines, especially in some local markets, these declines, were they to occur, likely would not have substantial macroeconomic implications. (Greenspan 2005)

At the time of Greenspan's testimony, the real house price index was 240, a mere 8 per cent below the eventual peak and almost 2.5 times the long term average.

Figure 9: Two price levels (property)

Real House Price Index

www.debtdeflation.com/blogs; Case-Shiller Index

The propulsion for this bubble was clearly provided by accelerating mortgage debt, and the rapid deceleration of debt drove it back down (see Figure 10). Positive feedback loops work in both directions—up and down.

Figure 10: Mortgage Acceleration & Change in Real House Price Index

Mortgage Acceleration & House Price Movements (Corr=0.78)

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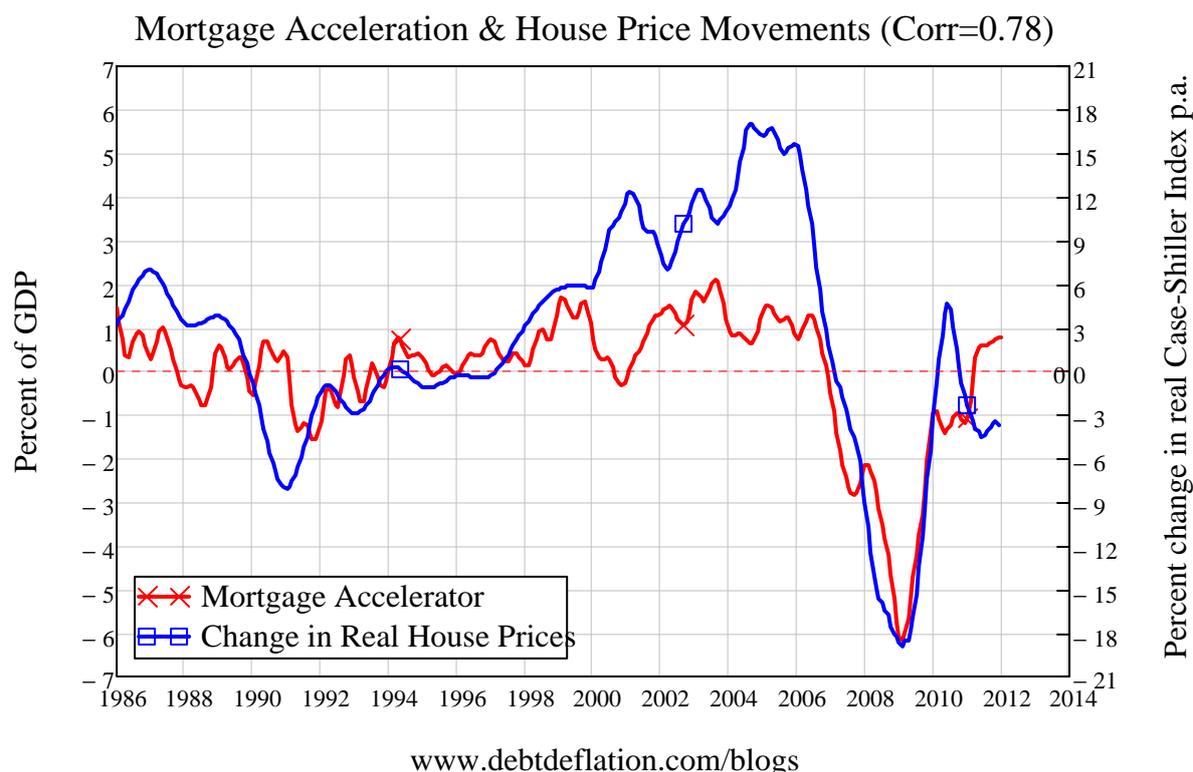
This "Minskian" perspective on the role of accelerating debt in driving asset price bubbles leads to several obvious conclusions:

1. The crisis will not be over until private debt has been reduced substantially—to the order of 100% of GDP or less;
2. Asset prices will fall with the reduction of debt. Even with the 33% decline by November 2011, the real house price Index remains 77% above the 1890-1995 average (and 50% above the mini-peak of 1990), while shares are still 67% above the long term trend from 1915-1995;
3. Ponzi Lending is the key cause of asset price bubbles;
4. Since debt cannot permanently accelerate, all asset bubbles will ultimately burst; and
5. To avoid asset price bubbles in the first place, we have to break the positive feedback loop between leverage and asset prices.

Remedies

If we are to really end the destructive instability of the financial system, we have to address the cause of this instability, and from a Minskian perspective, that cause is the positive feedback loop between rising debt and asset prices.

This cannot be done simply by relying upon banks learning from the crisis and behaving more responsibly after it, since they have an innate desire to extend as much debt as they can persuade the non-bank sectors to take on. The reason is simple: bank profits are driven primarily by the volume of debt. There is no mystery behind why the profits and wages of the FIRE economy have grown relative to the rest of the economy, nor behind the coincidence that negative FIRE profits have occurred only during the Great Depression and our current crisis (see Figure 11).

Figure 11: The FIRE Economy vs the Real Economy

Profits & Wages in the FIRE Sectors
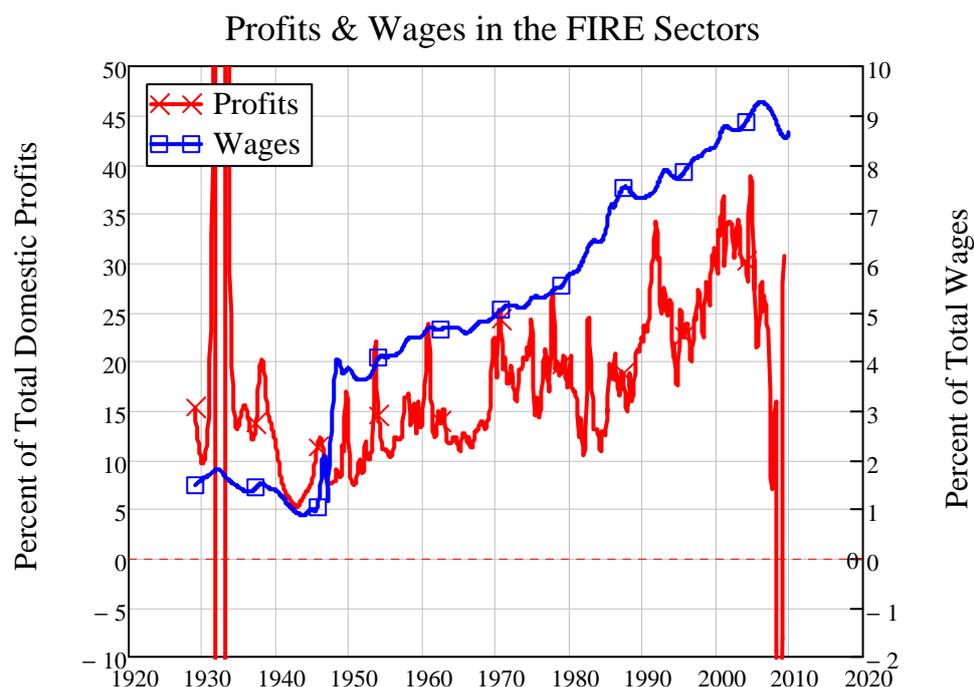
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But lending is a two-sided activity: the non-bank public has to be a willing participant if debt levels are to rise faster than income, and ultimately reach levels that can cause a financial crisis.

This always requires the prospect of gain from leveraged speculation on asset prices, since the public—both households and firms—rarely borrow excessively on the basis of income alone. A breakdown of household debt makes this point: as Figure 12 illustrates, despite all the enticements to personal debt, it changed very little relative to income, whereas mortgage debt has risen dramatically over time.[13]

Figure 12: Only Mortgage Debt has risen substantially

Household Debt by Type
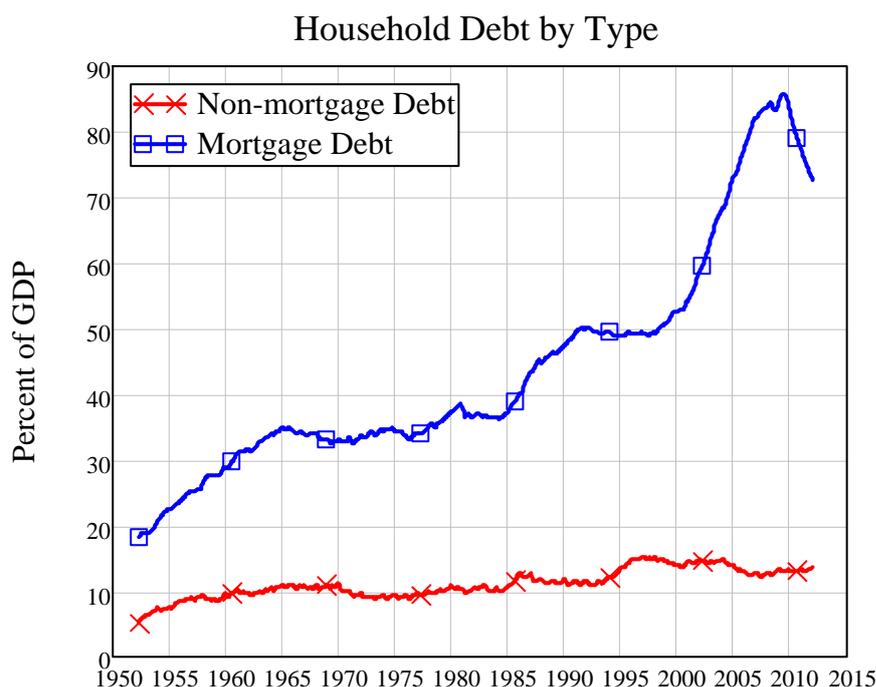
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To prevent bubbles, we therefore have to reduce the appeal of leveraged speculation on asset prices, without at the same time choking off demand for debt for either legitimate investment or unavoidable borrowing. I propose two mechanisms: "Jubilee Shares" and "Property Income Limited Leverage" ("The PILL"):

1. Jubilee Shares: To redefine shares so that, if purchased from a company directly, they last forever, but after a minimal number of sales (say seven), they become Jubilee Shares that last another 50 years before they expire; and
2. Property Income Limited Leverage: To limit the debt that can be secured against a property to ten times the annual rental of that property.

Jubilee Shares

Currently, 99% of all trading on the stock market involves speculators selling pre-existing shares to other speculators. This is undertaken with borrowed money in the hope of exploiting price bubbles like that set by Yahoo! in the DotCom Bubble (see Figure 13), when that the lending itself largely causes the price bubbles.

If instead shares on the secondary market lasted only 50 years, then even the Greater Fool couldn't be enticed to buy them with borrowed money–since their terminal value would be zero. Instead a buyer would only purchase a share on the secondary market in order to secure a flow of dividends for 50 years (or less). One of the two great sources of rising unproductive debt would be eliminated.

The objective of this proposal is to make leveraged speculation on existing shares unattractive, while still making funding IPOs and share issues attractive, and enabling genuine price discovery.

Figure 13: Yahoo's share price bubbles and bursts

Yahoo Share Price

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Property Income Limited Leverage

Some debt is needed to purchase a house, since the cost of building a new house far exceeds the average wage. But debt greater than perhaps 3 times average annual wages drives not house construction, but house price bubbles.

Property Income Limited Leverage ("the PILL") would break this positive feedback loop by basing the maximum that can be lent for a property purchase, not on the income of the borrower, but on a multiple of the income-earning potential of the property itself.

With this reform, all would-be purchasers would be on equal footing with respect to their level of debt-financed spending, and the only way to trump another buyer would be to put more non-debt-financed money into purchasing a property.

It would still be possible–indeed necessary–to pay more than ten times a property's annual rental to purchase it. But then the excess of the price over the loan would be genuinely the savings of the buyer, and an increase in the price of a house would mean a fall in leverage, rather than an increase in leverage as now. There would be a negative feedback loop between house prices and leverage. That hopefully would stop house price bubbles developing in the first place, and take dwellings out of the realm of speculation back into the realm of housing, where they belong.

Conclusion

I hope that my Minsky-inspired analysis of the source of financial market instability is compelling; I expect that my reform proposals are less so. But they are not so much radical as born from a realistic assessment, not only of the cause of financial instability, but the historical record of our past attempts to tame it.

We cannot rely upon laws or regulators to permanently prevent the follies of finance. After every great economic crisis come great new institutions like the Federal Reserve, and new regulations like those embodied in the Glass-Steagall Act. Then there comes great stability, due largely to the decline in debt, but also due to these new institutions and regulations; and from that stability arises a new hubris that "this time is different"—as the debt that causes crises rises once more. Regulatory institutions become captured by the financial system they are supposed to regulate, while laws are abolished because they are seen to represent a bygone age. Then a new crisis erupts, and the process repeats. Minsky's aphorism that "stability is destabilizing" applies not just to corporate behaviour, but to legislators and regulators as well.

Jubilee Shares and the PILL are an attempt to write restraints on Ponzi Finance into the fabric of our society, so that bubbles do not form in the first instance, so that the positive feedback loop that turns rising asset prices into accelerating debt does not happen, and so that another financial crisis like the one we are now in never occurs again.

Appendix: Double-entry versions of tables

Table 3: Double-entry version of Neoclassical vision of lending

	Bank Assets	Deposits (Liabilities)			
Action/Actor		Patient		Impatient	
		Assets	Liabilities	Assets	Liabilities
Make Loan		+Lend		-Lend	
Record Loan			-Lend		+Lend

And

Table 4: Double-entry version of actual lending

	Bank Assets		Deposits (Bank Liabilities)		
Action/Actor	Lending Licence	Loan Ledger	Patient	Impatient	
				Assets	Liabilities
Make Loan		+Lend		-Lend	
Record Loan	-Lend				+Lend

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[1] "The abstract model of the neoclassical synthesis cannot generate instability. When the neoclassical synthesis is constructed, capital assets, financing arrangements that center around banks and money creation,

constraints imposed by liabilities, and the problems associated with knowledge about uncertain futures are all assumed away. For economists and policy-makers to do better we have to abandon the neoclassical synthesis."

[2] The full sentence is "Stability—or tranquillity—in a world with a cyclical past and capitalist financial institutions—is destabilizing."

[3] Holmes, who was then Senior Vice-President of the New York Federal Reserve, argued that the belief "that the banking system only expands loans after the [Federal Reserve] System (or market factors) have put reserves in the banking system" was based on "a naive assumption". Instead, he argued, 'In the real world, banks extend credit, creating deposits in the process, and look for the reserves later. The question then becomes one of whether and how the Federal Reserve will accommodate the demand for reserves. In the very short run, the Federal Reserve has little or no choice about accommodating that demand; over time, its influence can obviously be felt.' (Holmes 1969, p. 73)

[4]   In a draft version, they stated this even more clearly: "Debt seems to be the residual variable in financing decisions. Investment increases debt, and higher earnings tend to reduce debt."

[5] Krugman has however just published posts which imply that he is now considering the role of the level and change in private debt: see http://krugman.blogs.nytimes.com/2012/01/30/eurozone-problems/ and http://krugman.blogs.nytimes.com/2012/01/22/notes-on-deleveraging/.

[6] To make them easier to comprehend I have omitted the double-entries used by accountants to ensure accurate accounting. Double-entry versions of both tables are supplied in the Appendix on page 20.

[7] This can also be a cheque drawn against the lending bank that can be deposited elsewhere in the banking system.

[8] The neoclassical vision could be restored as an acceptable simplification of reality if the textbook money multiplier model—in which "deposits create loans"—applied in reality. But as Holmes (then Senior Vice-President of the New York Fed) argued long ago, the view "that the banking system only expands loans after the [Federal Reserve] System (or market factors) have put reserves in the banking system" was based on "a naive assumption". Instead, he argued, "In the real world, banks extend credit, creating deposits in the process, and look for the reserves later. The question then becomes one of whether and how the Federal Reserve will accommodate the demand for reserves. In the very short run, the Federal Reserve has little or no choice about accommodating that demand; over time, its influence can obviously be felt… [but] In any given statement week, the reserves required to be maintained by the banking system are predetermined by the level of deposits existing two weeks earlier" (Holmes 1969, p. 73). Holmes was arguing against the Monetarist policy of attempting to control the economy by controlling the stock of money with regular injections of reserves, before this policy was adopted—and failed—in the early 1970s.
Holmes's advice was largely ignored by policymakers and neoclassical academic economists, but taken seriously by Post Keynesians, including Minsky. Belatedly, his point is being conceded by Federal Reserve economists: the money multiplier is a myth (Carpenter and Demiralp 2010).

[9] This omits the feedback effects between changing debt and the level of output, which are an obvious deduction from Schumpeter's and Minsky's analysis but would need a full nonlinear dynamic model to be properly specified.

[10] See http://www.ny.frb.org/research/global_economy/Crisis_Timeline.pdf.

[11] Post-Keynesians argue that marginal cost is constant or falling for most firms across their viable range of output, and this contention is strongly supported by the data; this is of course incompatible with marginal cost pricing, as Alan Blinder observed: "The overwhelmingly bad news here (for economic theory) is that, apparently, only 11 percent of GDP is produced under conditions of rising marginal cost…
Firms report having very high fixed costs—roughly 40 percent of total costs on average. And many more companies state that they have falling, rather than rising, marginal cost curves. While there are reasons to wonder whether respondents interpreted these questions about costs correctly, their answers paint an image of the cost structure of the typical firm that is very different from the one immortalized in textbooks." (105) (Blinder 1998, pp. 102, 105). See also Reynolds (1987, pp. 53-62).

[12] Defining GDP as the price level times real output, the Product Rule expansion of the right hand side of (1.3)

results in 5 terms, only one of which is for the rate of change of asset prices $\left(Q_A \cdot T_A \cdot \dfrac{d}{dt} P_A \right)$.

[13] A similar breakdown of business debt can't be easily derived from the data, but it would probably show a similar phenomenon: borrowing for investment and working capital would be relatively stable compared to borrowing for mergers and acquisitions.