

## Andrew G Haldane: Risk off

Paper by Mr Andrew G Haldane, Executive Director, Financial Stability, of the Bank of England, 18 August 2011.

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Four years on from the start of the Great Recession, the world economy is cloaked in uncertainty. The story so far is well understood. Over-extension of private sector balance sheets – in particular among banks – sowed the seeds of the crisis. Those private sector risks have since been socialised, either directly through support for the financial sector or indirectly through lower aggregate output in the economy at large.

That socialisation has caused balance sheet risk to migrate from the private to the public sectors. Today, these public sector balance sheets strains are most visible in Europe where a number of countries remain under the sovereign searchlight. But outside Europe, two of the world's three largest economies – the United States and Japan – have been the subject of ratings action. And sovereign CDS spreads among advanced countries are at their highest-ever levels.

Four years on from the start of the Great Depression, the world economy was also cloaked in uncertainty. In his inaugural address in 1933, newly-elected President Roosevelt famously captured the mood of the moment: “the only thing we have to fear is fear itself”. That fear factor is once again pervasive today. But do we have nothing to fear? And what role might policy – in particular macro-prudential policy – play in allaying those fears?

### Emerging from the Great Recession

The path out of recession is invariably a bumpy one. This time's Great Recession is unlikely to be an exception. Chart 1 compares the recent path of UK GDP with that following previous GDP dips: the Great Depression of the 1930s and the UK recession of the early 1990s. To date, GDP has steered a middle path, somewhat stronger than in the 1930s but weaker than in the early 1990s recovery.

If past recessionary experience is any guide, the UK's GDP trajectory might be expected to pick up pace from here. Most external forecasts remain broadly consistent with that view. But the risks around this path are considerable, as recent indicators of slowing global activity attest. This is not altogether surprising. Crisis-induced recessions are deeper and longer, on average taking up to three years to return to their pre-crisis peak (Chart 2).

Some take longer still. Following the Great Depression, UK GDP only recovered its pre-crisis level after 5 years. The US recovered its pre-crisis level after 7 years (Chart 3). Having reached this point, the US economy then lurched downwards again in 1937; it double-dipped. Roosevelt had been wrong in 1933. With hindsight, there had been plenty to fear.

As in 1933, the fear factor is rife in today's financial markets. The prompt has been sovereign debt concerns in parts of Europe and the United States. This is but the latest – and most severe – in a series of waves in sentiment since the onset of the crisis. Risk appetite has yo-yoed. In the language of the market, it has alternated between periods of “risk on” and “risk off”. Having been indecisive, financial markets are now not so sure.

That is reflected in surveyed measures of market participants' risk appetite (Chart 4). These were at above-average levels between 2005 and 2007 at the height of the boom. During 2008, risk appetite dramatically tailed-off. At its low-point in early 2009, it was more than two

standard deviations below normal. Since then it has ebbed (risk off) and flowed (risk on). Today, it is around one standard deviation below normal and falling. Risk is “off”.

Market metrics corroborate this story of acute risk aversion. The demand for safe assets has risen significantly. At a 10-year maturity, US government benchmark bond yields are at around their lowest levels in over two centuries (Chart 5) – despite the recent scare over US debt ceilings and subsequent downgrade. Long-term UK bond yields are also close to historic lows, as are investment grade corporate bond yields.

The price of gold has risen even more dramatically. Real gold prices have more than doubled since 2008, edging towards their previous high-water mark after the oil price shocks of the late 1970s (Chart 6). Safe-haven flows to the Swiss franc have boosted its value by over 30% against both the euro and the dollar since September 2008. The reach-for-return, familiar at times in the past, has flipped into a scramble-for-safety.

Risky assets tell a similar tale. The compensation investors demand for risk – the so-called risk premium – in advanced economy equities and investment grade corporate bonds is above or in line with its long-term average value. Bank lending spreads, which embody a compensation for risk, are materially higher for all classes of borrower. And measures of equity market uncertainty, such as the VIX, are at levels not seen since early 2009 (Chart 7). Not for nothing has the VIX become known as the “fear index”.

Some risky assets have fared better. Since their trough in late 2008, global high yield debt prices have risen by two-thirds, emerging markets equities have roughly doubled, while commodity prices have risen by even more. But even these assets have recently fallen from their peaks. Investors have concluded this is not a time for bravery. For much of this century, risk was cheap. Today it is expensive.

Market participants’ willingness to put risk capital to work can be seen in measures of financial market liquidity. Those have also yo-yoed (Chart 8). Excess liquidity during the first half of the century gave way to plummeting liquidity during the depths of the crisis. Today, despite rock-bottom global interest rates, market liquidity remains below normal levels. Risk capital is parked on the sidelines.

## **Balance sheet repair**

So what explains this continuing aversion to risk? Two factors are central: balance sheet disrepair and psychological scarring. In other words, both balance sheet fundamentals and market perceptions, perhaps detached from fundamentals, appear to be weighing on risk-taking.

Since the start of the crisis, balance sheets have been a good news/bad news story. The good news is that balance sheet repair is underway in many sectors and countries. The bad news is that this process appears to be far from complete, providing a continuing strong headwind to risk-taking. Consider in turn the balance sheets of banks, households, companies and governments.

Pre-crisis, banks’ balance sheets were furthest out of kilter. Average leverage in the global banking system – the ratio of banks’ assets to their equity – rose to highs of over 40 (Chart 9). At the height of the boom, every \$1 of bank assets was financed with \$98 cents of debt. The global banking system was financing itself with a 98% loan-to-value mortgage.

Since then, global banks have raised their equity by around \$500 billion and shrunk their assets by \$3 trillion. As a result, global banks’ leverage has halved to around 20, close to its long-run average. Today, every \$1 of bank assets is financed with \$95 cents of debt – a more modest, though still racy, 95% loan-to-value mortgage. Banks’ liquid assets have risen even more dramatically. UK and US banks’ cash ratios are at their highest levels for several decades.

But this balance sheet adjustment appears to be far from complete. Banks are midstream in their adjustment to new regulatory standards and, in some cases, new business models. That is reflected in expectations of banks' future profitability. These remain weak. Recent results for the major global banks delivered returns to equity well below target and closer to average levels from the previous century of around 10%.

Weak profit prospects are mirrored in equity prices. Today, the average market price of global banks' equity is slightly below its book value, having traded at a significant premium for much of the past 20 years (Chart 10). Around three-quarters of the world's 20 largest global banks have price-to-book ratios below one. Equity prices for these banks are, on average, back to levels last seen in 1998. For long-term holders of global bank equity, this has been a lost decade (and a bit).

As equity prices have fallen, market-based measures of bank leverage – the ratio of bank assets to the market value of their equity – have risen. During the crisis, such market-based measures of leverage did a much better job of identifying problem banks than conventional risk-weighted capital ratios.<sup>1</sup> So measured, the world's largest 20 banks are at present around 36 times levered. That is a loan-to-value mortgage of around 97%.

The household sector, too, has been repairing its balance sheet. On average across the US, UK and euro-area, households are running a financial surplus of around 2.5% of GDP (Chart 11). As recently as 2006, they were running a financial deficit of 1% of GDP. Since 2007, around £100bn has been repaid each year by UK households. Deleveraging is underway.

Yet this aggregate picture masks some important distributional differences. There remains a sizable tail of over-indebted households vulnerable to a worsening of financial conditions. In the UK, the proportion of households in negative equity is 1 in 14. In the US, it is 1 in 4. With house prices falling in both countries, that fraction may rise further.

The tail of "vulnerable" households (those with limited or no equity in their property and reporting problems servicing their debt) is high and rising. So defined, vulnerable households in the UK account for 15% of household secured debt and 35% of unsecured debt (Chart 12). These shares have risen over the past three years, by around 5 and 10 percentage points respectively, despite interest rates being at rock-bottom.

The picture in the corporate sector is, in some respects, not dissimilar. Companies in the main advanced countries are running significant financial surpluses, on average of around 2.5% of GDP (Chart 13). Pre-crisis, companies were running financial deficits of around 1% of GDP. The cash position of the corporate sector is even more striking, with large UK corporates' stock of cash up by over 40% since 2006.

But as among households, this picture of aggregate health conceals a long tail. A number of companies appear to be struggling to meet interest payments even at ultra-low interest rates. The fraction of companies whose profits do not cover interest payments has actually risen slightly since the crisis; it is currently around one third (Chart 14). Within some sectors, such as property, debt-servicing capacity has deteriorated sharply.

Despite these balance sheet headwinds, the macroeconomic situation today is far better than at the time of the Great Depression – with one exception. The exception is government finances. Despite the much smaller fall in GDP, UK government debt-to-GDP ratios have deteriorated more than in the 1930s (Chart 15). This pattern is mirrored across advanced economies. The IMF expect debt-to-GDP ratios in the G7 economies this year to breach 100% of GDP for the first time since the Second World War (Chart 16).

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<sup>1</sup> Perhaps because banks' asset measurement is not distorted by errors in risk weights and equity measurement is forward-looking and not distorted by different capital definitions – see Haldane (2011).

There is no magic number for debt ratios. But the historical record is revealing. Historically, ratios in excess of 90–100% of GDP have been found to exert a lasting drag on growth, perhaps of around 1 percentage point.<sup>2</sup> At these levels, government debt has in the past been growth-sapping – and fear-enhancing. That adds to pressures on debt sustainability, which depends importantly on the wedge between interest costs and GDP growth.

### **Psychological scarring**

These balance sheet scars are real. But in financial markets, risk perceptions are as important as reality. Behavioural economics tells us that financial crashes can leave lasting psychological scars on risk-taking. These mean that perceptions of risk can be systematically over-stated – the fear of fear itself.

One potent psychological factor is disaster myopia. Psychologists know from experimental evidence that, faced with uncertainty, people base their judgements on simple rules of thumb or heuristics.<sup>3</sup> One such rule of thumb is the “availability heuristic”. This states that agents base probabilistic assessments on the ease with which an event can be brought to mind: how recently it has occurred, how severe are its effects and how personal is the experience.

Car crashes are the classic example. These often arise from disaster myopia, as drivers systematically under-estimate the probability of a pile-up and drive too fast. The longer the period since the last crash, the greater the risk-taking. After a lengthy stretch of clear motorway, risk appetite may become too healthy, and risk-taking too great, relative to the true probability of disaster. In other words, drivers are disaster-myopic.

Should a crash occur, however, risk-taking incentives go into reverse gear. Their closeness to a disaster event causes drivers to move more slowly than might be justified by the underlying risk. The experience heuristic leads to an over-weighting of recent, severe, personal events. Risk appetite then switches from too high to too low relative to the true risk. The result is traffic congestion.

Financial crashes and car crashes have common psychological roots. One of the causes of the crisis was an under-pricing of risk. That was rooted in disaster myopia – an under-estimation of risk during the so-called Great Moderation. Memories of financial disaster had faded, with the Great Depression in almost no-one’s experience sample. The upshot was an over-healthy appetite for risk-taking.

The subsequent crash has turned these behaviours on their head. Memories of financial disaster are now fresh, as after the Great Depression, causing an over-estimation of the probability of a repeat disaster. In these situations, psychological scarring is likely to result in risk appetite and risk-taking being lower than reality might suggest. Risk will be over-priced. Today, the very disaster myopia that caused the crisis may be retarding the recovery.

Disaster myopia may be more potent in the markets than on the motorways. Asset prices are guesses about the future. Faced with uncertainty about the future, market participants form these guesses using their own heuristics. One such heuristic is the “popular narrative” – a simple story that aims to make sense of reality. Risk on/risk off is precisely such a popular narrative.<sup>4</sup>

The effect of popular narratives is to increase psychological contagion in financial markets. Simple stories generate market mood swings. The greater the uncertainty, the more compelling the simple story and the greater the amplitude of these mood swings. These

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<sup>2</sup> Reinhart and Rogoff (2010).

<sup>3</sup> For example, Tversky and Kahneman (1974).

<sup>4</sup> For example, Akerlof and Shiller (2009), Tuckett (2011)

swings in turn result in a detachment of risk perceptions, and hence asset prices, from reality.

Financial trauma, like personal trauma, can increase this detachment from fundamentals. For those who lived through it, the Great Depression had a lasting effect on financial risk-taking. “Depression Babies” have been shown to seek less risky capital structures and to avoid financial stocks.<sup>5</sup> The scarring effects of the Great Depression on risk attitudes help explain the excess premium demanded by equity investors during the previous century.<sup>6</sup> The Great Depression left risk-taking scars that lasted a lifetime.

The Great Depression has now been lost from most investors’ experience sample. Indeed, that fact might help explain another popular narrative from the past – the Great Moderation. But the Great Depression has recently been replaced in investors’ experience sample by the Great Recession. Whether this will spawn an era of “Recession Babies”, with a permanently lower appetite for financial risk-taking, remains to be seen. But past evidence suggests that any recovery in risk appetite might take time – more time than fundamentals would imply.

All of these behavioural elements have come together in today’s financial markets – disaster myopia, intrinsic uncertainty and deep trauma. This may help explain why risk-takers have their foot poised on both brake and accelerator, why risk capital is in stop-start mode. That implies a risk of heavy and persistent financial congestion in the period ahead. With hindsight, Roosevelt’s fear (of fear) in 1933 was well-founded, economically and psychologically. It may also be being repeated.

### **The role of macro-prudential policy**

As long as aversion to risk-taking is causing financial congestion, growth (like traffic) will remain sluggish. The public policy question, then, is whether anything can be done to allay the fear factor, speed the repair of balance sheets and stimulate risk-taking.

Experience during the Great Depression taught us a great deal about the role of fiscal and monetary policy in these situations. Indeed, in many respects the Great Depression was the birthplace of activist monetary and fiscal policy, today’s conventional arms of macro-economic policy. For different reasons, however, these arms are at present close to fully stretched. In countering the fear factor, that begs the question of what else might be done?

With fortuitous timing, there is a new tool in the box, a third arm of macro-economic policy. This is so-called macro-prudential policy. As its name implies, this policy tool is intended to meet macro ends using prudential means. The UK has recently put in place an explicit macro-prudential regime. In July of last year, the UK government announced a new Financial Policy Committee (FPC) to execute macro-prudential policy.<sup>7</sup> The FPC is housed in the Bank of England and met for the first time in June this year.

The FPC’s objective is to protect and enhance the resilience of the UK financial system against risks including “unsustainable levels of leverage, debt or credit growth”. Therein lies a key FPC challenge. There is evidence of unsustainably *high* levels of leverage in some sectors. But elsewhere, there is evidence of credit growth being unsustainably *low*. Some companies remain over-leveraged. Yet others are suffering a credit shortage, with bank lending to companies continuing to contract over the past 12 months.

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<sup>5</sup> For example, Graham and Narasimhan (2004), Malmendier and Nagel (2011).

<sup>6</sup> For example, Cogley and Sargent (2008), Barro (2006).

<sup>7</sup> HM Treasury (2010).

In framing macro-prudential policy today, both these factors need to be weighed: on the one hand, enhancements to the *risk-bearing* capacity of the financial system to repair balance sheets; on the other, encouragement for the *risk-taking* capacity of the system to boost credit supply. These factors can sometimes point in subtly different directions. The first might point to higher buffers to boost banks' risk-bearing capacity, while the second might point to lower buffers to boost their risk-taking capacity.

Faced with that balancing act, one of the FPC's recommendations in June was for banks to raise their levels of capital opportunistically. That meant banks should retain, rather than distribute to shareholders or staff, any windfall profits. Additional retained profits could then be used either as insurance against future risk (risk-bearing) and/or to finance extra lending (risk-taking). In other words, opportunistic capital-raising could help banks hit the twin objectives of risk-bearing and risk-taking with a single stone.

Looking ahead, the balance of these forces may tilt again. Risk-taking is in retreat. And past crisis experience suggests that the contraction of lending internationally may have further to run (Chart 17). The FPC, like the MPC, needs to act symmetrically in response to these developments. Its job is to cushion the fall as well as arrest the rise in credit and debt.

One practical role for macro-prudential policy in these situations is to communicate about risks to the system to better enable these risks to be priced. If risk is over-priced, and agents over-pessimistic, communicating that might help in correcting overshoots in risk appetite. That was precisely the role played by Roosevelt's inauguration speech in 1933. It provided an alternative, more optimistic, popular narrative for financial markets. It aimed to reduce the risk of psychological contagion. It worked. Risk appetite and real activity recovered between 1933 and 1937. A more optimistic popular narrative might have a role to play in helping correct today's market pessimism.

A second practical role for macro-prudential policy is to make recommendations for how regulation might contribute towards moderating the credit cycle. The Basel Committee has recently developed guidelines for one potential macro-prudential tool – banks' counter-cyclical capital buffer. This guideline is based on deviations in the ratio of credit-to-GDP from its long-term trend. This has been shown to be a reliable early warning indicator of future crises across a wide range of countries. It is akin to a Taylor rule for macro-prudential policy.

Chart 18 plots the path of the UK credit-to-GDP guide-path over recent years. Unsurprisingly, it suggests that UK banks' capital ratios should have been tightened in the run-up to the crisis, with credit-to-GDP above its long-term trend by up to 10 percentage points. That disequilibrium has since been completely eliminated as credit growth has collapsed. Currently, the guide-path is close to cycle-neutral. Any further fall would put credit below its cycle-neutral level, implying a loosening to support risk-taking.

Setting regulation to boost risk-taking may feel like a new and radical departure from the past. But in fact it is neither as radical nor as new as it might first appear. In 1938, the US was facing a double-dip recession. Criticism of banks' unwillingness to lend to the real economy was rampant. Fear in financial markets was mounting. The situation was eerily reminiscent of today.

At that point, Roosevelt turned macro-prudential. In the Uniform Agreement on Bank Supervisory Procedures, a relaxation of prudential and valuation standards was announced for US banks. This aimed explicitly to support lending and activity in the real economy, "the activist goal of liberalizing bank examinations to make them dynamically adjustable to current economic policies".<sup>8</sup> It worked. Lending and growth resumed.

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<sup>8</sup> Simonson and Hempel (1993).

In the period since, the first two arms of macro-economic policy – monetary and fiscal – have been used actively. The third – macro-prudential – has been tied behind policymakers' back. The crisis of the past few years has highlighted the need to free the macro-prudential arm of policy. As in the 1930s, macro-prudential policy may have a role to play in shouldering the heavy burden of damaged balance sheets and diminished risk appetites.

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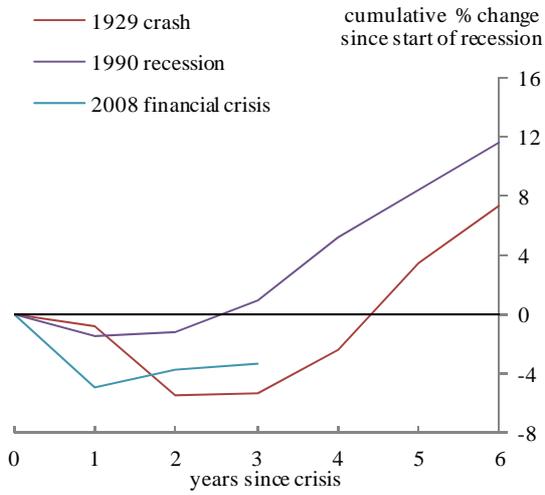
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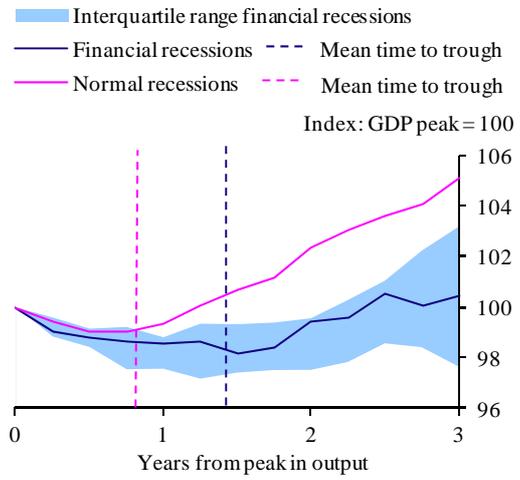
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Chart 1:  
**Changes to UK real GDP  
 in crisis periods**



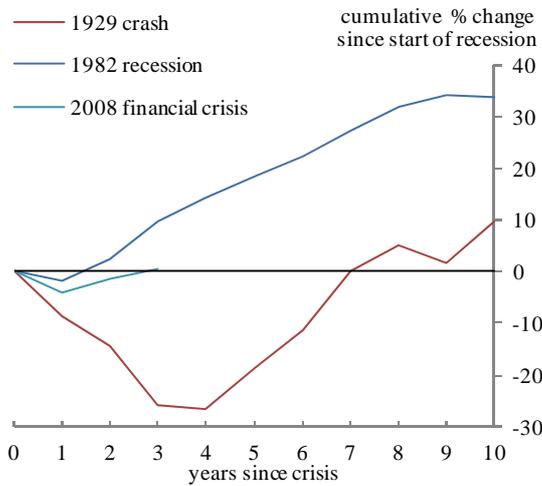
Sources: Office for National Statistics, Thomson Reuters Datastream and Bank calculations.

Chart 2:  
**Recessions and recoveries**



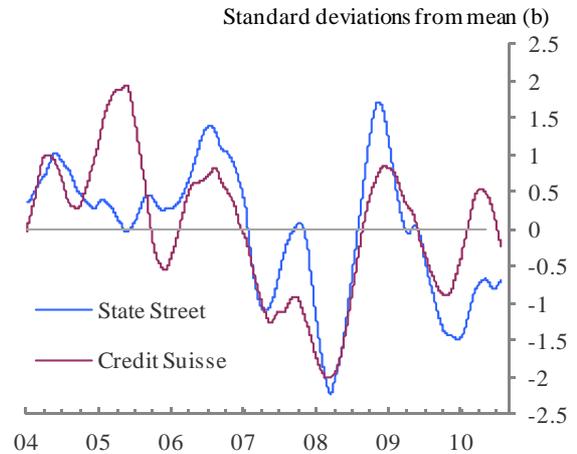
Sources: International Monetary Fund and Bank calculations. (<http://www.imf.org/external/pubs/ft/weo/2009/01/index.htm>)

**Chart 3:  
Changes to US real GDP  
in crisis periods**



Sources: Global Financial Data, Case-Shiller, Federal Reserve, US government bodies (Department of Commerce, Department of Labor, Council of Economic Advisers) and Bank calculations.

**Chart 4:  
Risk appetite<sup>(a)</sup>**

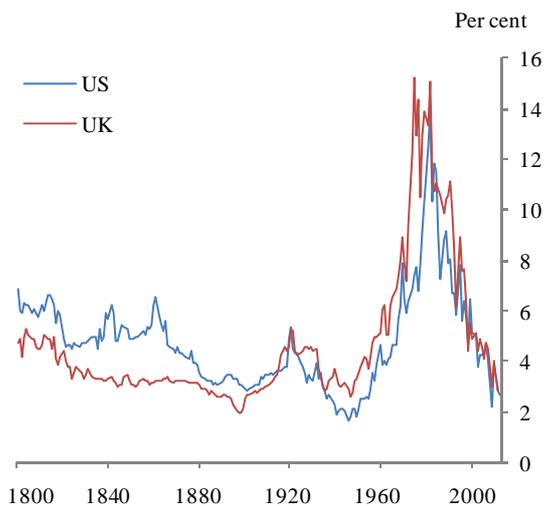


Sources: Bloomberg, Credit Suisse and Bank calculations.

(a) Indices are adjusted so that positive numbers indicate increased risk-taking and negative numbers indicate reduced risk-taking.

(b) 90-day moving average of standard deviations from mean. Mean and standard deviation calculated from 28 July 2004.

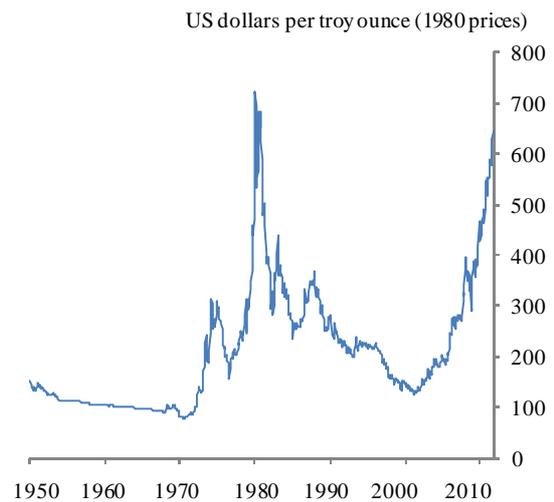
**Chart 5:  
Long run government bond yields<sup>(a)</sup>**



Source: Global Financial Data.

(a) US yields are on 10 year bonds. UK yields are on consolidated stock up to 1957; 10 year bonds after 1957.

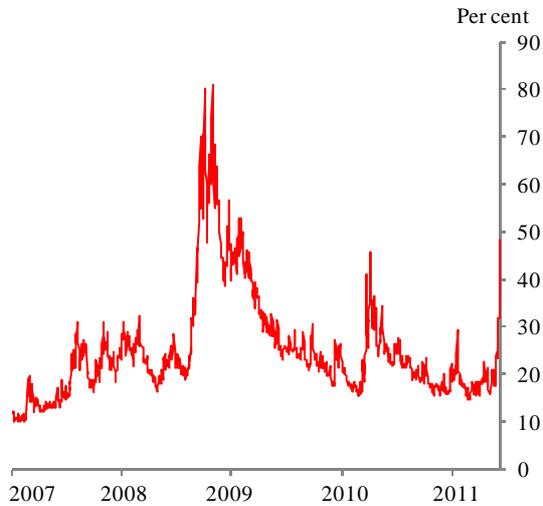
**Chart 6:  
Long run gold prices<sup>(a)</sup>**



Sources: Bloomberg, Global Financial Data and Bank calculations.

(a) Deflated using US CPI. CPI for July and August 2011 is projected.

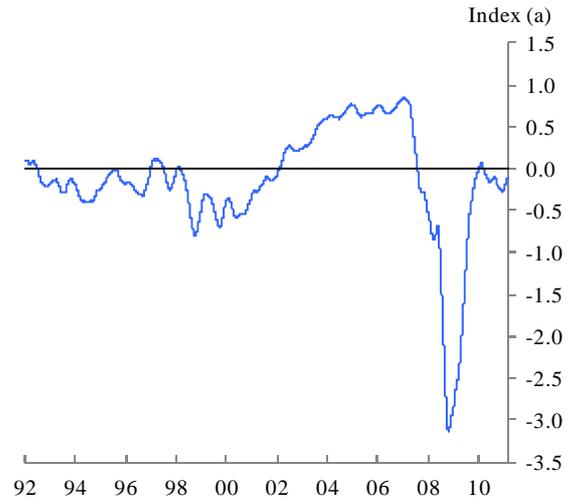
Chart 7:  
**VIX Index<sup>(a)</sup>**



Source: Global Financial Data.

(a) S&P 500 implied volatility (daily closing prices).

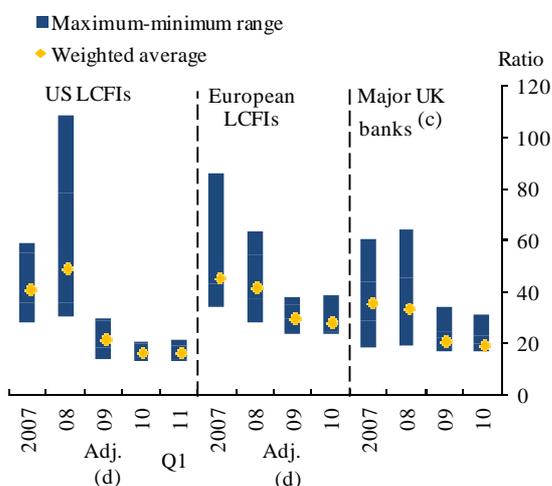
Chart 8:  
**Market liquidity**



Sources: Bank of England, Bloomberg, Chicago Board Options Exchange, Debt Management Office, London Stock Exchange, Bank of America Merrill Lynch, Thomson Reuters Datastream and Bank calculations.

(a) 90-day moving average of index. Index represents number of standard deviations from the mean of a range of market liquidity measures, incorporating prices and volumes, normalised on the period 1999–2004. The indicator is more reliable after 1997 as it is based on a greater number of underlying measures. See also Box 1 of the April 2007 Bank of England *Financial Stability Report*.

Chart 9:  
Major UK banks' and LCFIs' leverage ratios<sup>(a)(b)</sup>



Sources: Bank of England, published accounts and Bank calculations.

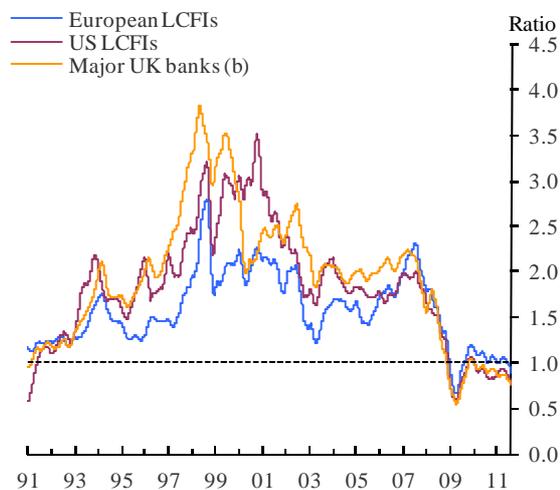
(a) Leverage ratio defined as assets divided by capital. Assets are adjusted for cash items, tax assets, goodwill and intangibles. Capital includes total shareholders' equity adjusted for minority interest, preference shares, goodwill and intangibles.

(b) Assets are also adjusted on a best-efforts basis to achieve comparability between US GAAP and IFRS with respect to derivatives and off-balance sheet vehicles.

(c) Excludes Northern Rock. Data for Co-operative Bank are used for Co-operative Financial Services. *Pro-forma* data are used for RBS from 2007 to 2009.

(d) Revisions to US GAAP accounting rules on consolidation from 1 January 2010 are applied to end-2009 data giving a clearer measure of leverage.

Chart 10:  
Major UK banks' and LCFIs' price to book ratios<sup>(a)</sup>

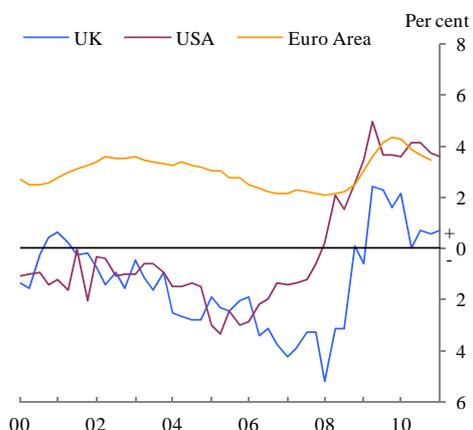


Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) Chart shows the ratio of share price to book value per share. Simple averages of the ratios in each peer group are used. The chart plots the three-month rolling average.

(b) Excludes Northern Rock (from end-2007), Nationwide and Britannia.

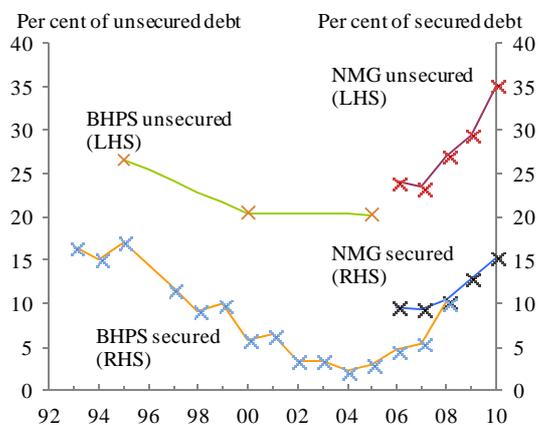
Chart 11:  
Household financial surplus<sup>(a)</sup>



Source: Thomson Reuters Datastream, ECB and Bank calculations.

(a) Per cent of GDP.

Chart 12:  
Illustrative estimates of debt held by vulnerable UK households<sup>(a)(b)</sup>



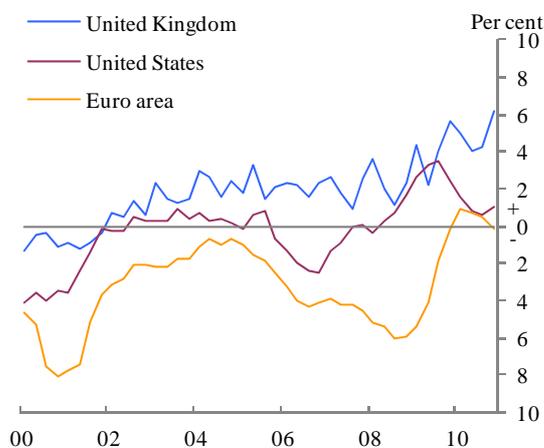
Sources: British Household Panel Survey (BHPs), NMG Consulting survey and Bank calculations.

(a) Vulnerable mortgagors are those with housing equity below 5%, or housing equity below 25% and at least one characteristic suggesting debt-repayment difficulties. Vulnerable unsecured debtors are those with less than 25% housing equity (including renters) and at least one characteristic suggesting debt-repayment difficulties.

(b) Based on historical BHPs data and more timely information from the annual NMG survey. Differences in survey questions and sample size mean the estimates from the two surveys are not directly comparable.

Chart 13:

**Corporate financial surplus<sup>(a)</sup>**

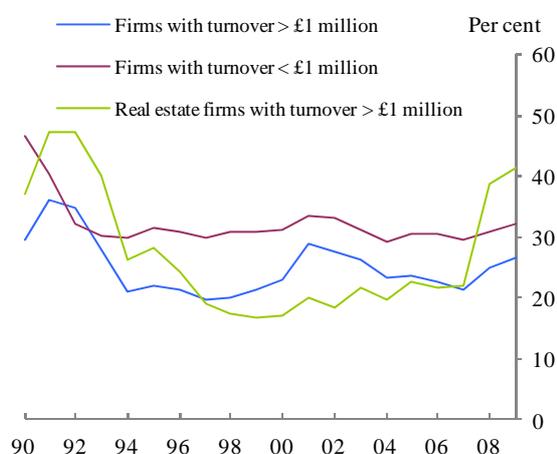


Source: Thomson Reuters Datastream, ECB and Bank calculations.

(a) Per cent of GDP except Euro area which is as a per cent of GVA.

Chart 14:

**Percentage of firms with interest payments greater than profits<sup>(a)(b)</sup>**



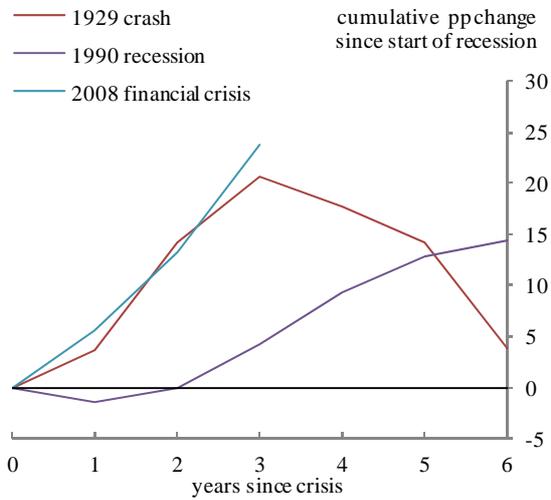
Sources: Bureau Van Dijk and Bank calculations.

(a) Percentage of companies in each category with interest payments greater than their profits before interest.

(b) Data include firms reporting turnover, profit and interest paid. These firms may not be representative of the population. Total sample size varies over time, ranging from around 14,000 in 1990 to over 90,000 in 2000. Changes in the composition of the data set may reduce comparability over time. Subsidiaries, as identified from company structures, are excluded. Company accounts are assigned to calendar years according to the statement date. The real estate sector is identified using SIC (2003) and SIC (1992) codes (the sample ranges from around 450 to 1,600 firms).

Chart 15:

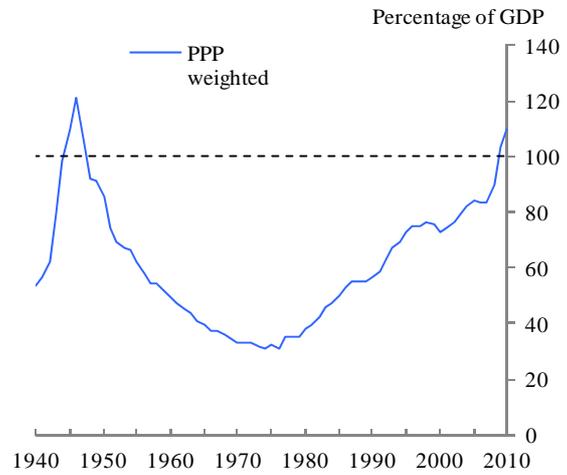
**Changes to UK gross government debt ratio in crisis periods**



Sources: Office for National Statistics, Thomson Reuters Datastream and Bank calculations.

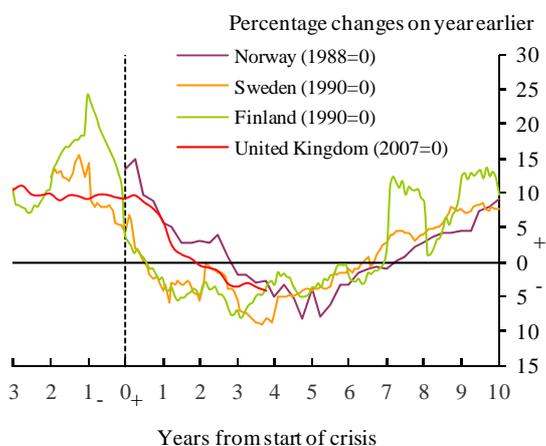
Chart 16:

**Public debt ratios in G7 countries**



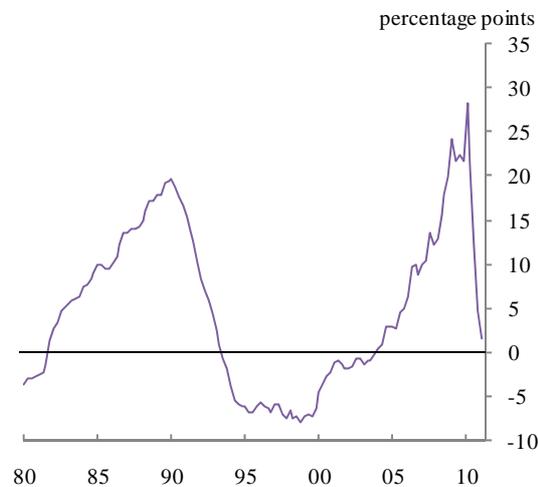
Sources: IMF Historical Public Debt Database, IMF *World Economic Outlook* (April 2011), Angus Maddison historical statistics and Bank calculations.

Chart 17:  
Real lending growth rates



Sources: Bank of England, central bank financial stability reports, Thomson Reuters Datastream and Bank calculations.

Chart 18:  
UK credit-GDP gap<sup>(a)(b)</sup>



Sources: IMF and Bank calculations.

(a) Based on the guidance variable for the Basel III countercyclical buffer. Credit is defined as M4 lending. The credit-to-GDP gap is calculated as the percentage point difference between the credit-to-GDP ratio and its trend, where the trend is based on a one-sided HP filter with a smoothing parameter of 400,000.

(b) Last data point is Q1 2011.