

## Charles Bean: Central banking in boom and slump

Speech by Mr Charles Bean, Deputy Governor for Monetary Policy of the Bank of England, at the JSG Wilson Lecture in Economics, University of Hull, Hull, 31 October 2012.

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Good evening! It is a great privilege to be asked to give this year's JSG Wilson Lecture. Professor Wilson wrote extensively on many topics central to recent events, most notably money markets, monetary policy and banking. Given these interests, it is perhaps unsurprising that the Bank of England often fell under his gaze. Indeed, in his review of monetary policy in the 1960s, he was moved to remark that "the most notable contribution [the Bank of England] has made to the emergence of a new climate is in the matter of publicity and relatively frank speaking" (Wilson, 1966). I hope that I will live up to that pitch this evening, although I aim to demonstrate that our recent contributions have been somewhat more substantive than mere words!

Last Thursday, we heard that the UK economy grew 1% in the third quarter. Yes, it was boosted by one-off factors relating to the Diamond Jubilee and the Olympics. But, even after taking those into account, the figure was stronger than expected. That was welcome news, for the past five years have not been easy. Following the bursting of the financial bubble, policymakers in the advanced economies have faced unprecedented challenges. Central banks have needed to find new ways to support a financial system under great stress and to buttress economic activity. Moreover, the crisis also revealed a major hole in our framework for managing the economic and credit cycles. So tonight I want to discuss some of the actions we have taken in dealing with the crisis and subsequent recession, as well as explaining some of the attendant reforms to the policy framework.

Let me begin by rewinding the clock five years to August 2007 when financial markets first seized up.

UK GDP had grown continuously and at a steady pace for the preceding 64 quarters. And consumer price inflation had been within a percentage point of the Government's inflation target for every month bar one since the Bank was given operational responsibility for monetary policy in 1997. Such stability was historically unprecedented. But the United Kingdom was not unique: other advanced economies also experienced a long period of unusually benign macroeconomic outcomes.

The period of unusual stability led households, businesses and especially financial institutions to underestimate the risks they were exposed to. Together with historically low interest rates, at both the short and long end of the yield curve, that encouraged a debt-fuelled "search for yield". The associated expansion in credit is shown for this country in Chart 1. Note that the debt of financial sector companies is plotted on a different scale to that for households and real-economy businesses; the remarkable feature of this period is not the expansion in household or business credit, but the huge increase in the indebtedness of financial companies. A similar picture obtains for many other advanced economies, including the United States. This expansion in credit put upward pressure on a range of asset prices, including property.

But macroeconomic factors were not solely responsible for the crisis. Several failings at the microeconomic level were also relevant, including: inadequate risk management by financial institutions; the use of off-balance sheet vehicles to evade regulatory capital requirements; weak standards in loan origination, especially in the US sub-prime market; pay packages that encouraged high-risk trading strategies; and informational deficiencies stemming from the underlying complexity of new financial instruments (Bean, 2010). Above all, the huge rise in financial sector debt I noted a moment ago was associated with a much greater and more complex web of exposures between different financial entities, increasing the risk that a

failure in one part of the financial sector would have systemic consequences. Together these factors help explain the extreme severity and geographic reach of the crisis.

In the years preceding the crisis, there was some debate in central banking circles as to whether monetary policy should do more to work against a credit/asset price boom, even though there might be few signs of overheating in the real economy. On one side, economists at the Bank for International Settlements (e.g. White, 2006), argued that monetary policy was too loose and should instead “lean against the wind” of a credit/asset-price boom in order to reduce risks further down the road. On the other side, people such as the Chairman of the Federal Reserve, Alan Greenspan (2002), doubted the feasibility of such an approach and advocated a policy of benign neglect during the boom phase, along with aggressive relaxation should there be a collapse of asset prices.

As I noted some years ago (Bean, 2003), such “leaning against the wind” is in principle compatible with flexible inflation targeting: a central bank ought to be willing to undershoot its inflation target temporarily, if it believes that it will thereby improve its chances of meeting the target later on by avoiding a disruptive bust. The crisis and subsequent Great Recession seem to make this logic even more compelling. But unfortunately, by the time an unsustainable credit boom has been diagnosed, a small increase in policy rates is unlikely to do much to cool it. And a large increase is likely to generate unacceptable collateral damage to the real economy.

In a paper for the Federal Reserve’s annual conference at Jackson Hole a couple of years ago (Bean et al., 2011), I reported the results of some simulations of what might have happened if Bank Rate had been

200 basis points higher during the four years before the crisis began. The answer is that while the rise in real house prices over that period would have been less than half as large, the impact on overall real credit growth would have been pretty modest, reducing it by only a tenth – hardly enough to have a major bearing on the magnitude of the subsequent bust. Moreover, output would have been some 3 per cent lower. Monetary policy on its own therefore does not seem especially well suited to preventing credit/asset-price booms.

So the crisis exposed not only the inadequacy of our understanding of the true nature of the risks that had built up in the financial sector, but also the need for suitable instruments to deal with them. One of the key reforms in the United Kingdom following the crisis has been to establish a body – the Financial Policy Committee (FPC) – with the responsibility for overseeing the stability of the financial system, together with specific powers to achieve that. The FPC will exist on a statutory basis once the Financial Services Act has passed into law, but has been operating on an interim basis since June 2011.

The FPC has two objectives. First and foremost, it is charged with identifying, monitoring and taking action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system. But that is accompanied by a secondary goal: subject to protecting resilience, it should support the economic policy of the government, including its objectives for growth and employment. This formulation mirrors that for the Monetary Policy Committee and should ensure that the FPC approaches its primary objective of ensuring resilience of the financial system in a way that does not unduly impede economic growth.

Seven of the members of the Committee, including myself, are drawn from within the financial authorities: the Bank of England and the Financial Services Authority (FSA).<sup>1</sup> The remaining four are external members who bring special expertise and experience and can

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<sup>1</sup> At present they are: the Governor; the two Deputy Governors; the executive directors for Financial Stability and for Markets; and the Chairman and Chief Executive of the FSA. When the FSA is dissolved into the Prudential Regulation Authority (PRA), which will be part of the Bank, and the Financial Conduct Authority (FCA), these last two will be replaced by the heads of the PRA (who will be a third Deputy Governor of the Bank) and FCA.

reduce the risk of the “group think” that might arise in a committee comprised solely of insiders. There is also a non-voting representative from the Treasury.

The powers of the Committee are two-fold. First, the FPC can issue recommendations. These could be general recommendations, for instance to financial institutions or the Treasury. Or they could be specific requests to the prudential or conduct regulators who would then be expected to comply with the recommendation or else explain why not. Such recommendations might be called for if there are structural developments – for instance, new financial instruments – taking place in the financial system that appear to increase the risk of financial instability.

Second, once the Act has come into force, the FPC will be able to direct the prudential regulator to implement changes to a small set of instruments in order to achieve its objectives. On the basis of advice from the FPC, the Treasury is presently consulting on those instruments (HM Treasury, 2012). As it stands, the current proposals include three tools.

First, there is a countercyclical capital buffer. Under the Basel III capital framework, banks will be required to hold a higher level of bank capital relative to their risk-weighted assets. But national regulators will be able to require an additional time-varying buffer that can be increased during the upswing of the credit cycle and released during the downswing. Under Basel III, the countercyclical capital buffer will be phased in from the beginning of 2016, becoming fully effective only at the start of 2019. But the Government has said that it plans to use whatever flexibility is available to give the FPC power over the buffer as soon as is practicable.

There are two ways that such an additional capital buffer mitigates systemic risks. First, it provides a larger cushion against potential losses, so providing greater resilience in the face of a bust. Second, the imposition of such an additional capital requirement may also inhibit the expansion of banks’ balance sheets, so dampening the upswing of the credit cycle. This second mechanism obviously requires the Modigliani-Miller theorem to fail, in the short run at least; if it doesn’t then there is no reason for a bank’s management to prefer debt finance to equity finance. Now the most obvious reason why the Modigliani-Miller theorem fails for banks is the implicit subsidy to debt finance that comes from being “too big (or too complex) to fail” so that taxpayers, rather than creditors, pick up the tab if capital is insufficient to absorb losses. Recent and prospective regulatory reforms seek to reduce the too big/too complex to fail problem, but eliminating it entirely may be an aspiration too far. Moreover, there are likely to be other frictions to raising capital which mean that raising capital requirements will inhibit balance sheet growth, providing traction for the countercyclical capital buffer. However, this is an area where empirical evidence is in relatively short supply (though for some examples, see: Macroeconomic Assessment Group, 2010; and Aiyar et al., 2012).

The second tool is the ability to vary capital requirements by type of asset, allowing the FPC to target excessive exuberance in specific sectors. The EU will permit national authorities such discretion in regard to residential property, commercial property and intra-financial sector exposures. While this list is clearly not exhaustive, it does include some of the main sectors that have historically been most subject to over-exuberant credit growth.

The final tool is the ability to set and vary a minimum leverage ratio. A leverage ratio is essentially just (a transformation of) the ratio of capital to unweighted assets. Such a measure fails to allow for the varying riskiness of different forms of lending. However, the wide variation in risk weights across banks raises questions about the reliability of those risk-weight models. Moreover, as my colleague Andy Haldane (Haldane and Madouros, 2012) recently documented, a simple leverage ratio measure does a somewhat better job of predicting which banks were more likely to get into difficulties during the crisis than does a

risk-weighted capital ratio<sup>2</sup> (see Chart 2). Given the imperfections of risk-weighting, the ability to impose a minimum leverage ratio provides a useful additional instrument that can backstop the usual risk-weighted capital ratio. International discussions about the implementation of a leverage ratio are still continuing and this instrument is only likely to become part of the FPC's toolkit after 2018.

The application of these so-called macroprudential policies is still very much at the developmental stage. When the Bank gained operational responsibility for monetary policy in 1997, there was a long history of practical experience, together with a vast theoretical and empirical literature for us to draw on. That didn't make setting monetary policy easy, but it certainly helped. By comparison, we are still in the Stone Age in respect of deploying macroprudential policies. There is lots of scope for academia to help us out here, on both the theoretical and empirical fronts.

Even so – indeed, in large part because of that state of relative ignorance – I think one can lay out some key principles that should govern the deployment of the FPC's tools. It will be very easy for the future FPC, particularly during long periods of tranquillity, to slip into the temptation of neurotically twiddling the dials on its instruments or issuing recommendations left, right and centre. But what will determine the worth of the FPC will be whether it is successful in heading off the really big risks – in other words, avoiding a repeat of the sort of crisis we have just experienced. Ensuring resilience, rather than fine-tuning the credit cycle, must be the name of the game.

Second, when the FPC does find it necessary to act, it will need to show resolution in taking the punchbowl away as the party is just getting going. With recent events so fresh in everyone's memories, this may not seem much of an issue now. But in a decade or two's time, when recent events have receded into history, such actions will be less welcome. No doubt there will be plenty of people willing then to claim that "this time is different" and that the FPC's actions are unnecessarily inhibiting growth. Moreover, if the FPC's actions are successful in avoiding a subsequent financial crisis, critics may claim this as evidence that action was unnecessary in the first place. A central role for the FPC will therefore be to institutionalise the memory of this and other financial crises.

Finally, the FPC's instruments may sometimes prove relatively ineffective. That is more likely to happen when the problems lie beyond the regulatory boundary in the shadow banking sector. At such times, monetary policy may need to act in a supportive manner, leaning against the wind even though that may mean accepting a temporary deviation of inflation from target. Achieving this will require appropriate co-ordination between the two Committees. That should be facilitated by their considerable overlap in membership.

So far I have focussed on how the Bank will be able to dampen a future boom and strengthen resilience in the face of excessive exuberance in financial markets. Let me now turn to what may seem a more timely issue, namely what the central bank can do during and after a financial crisis of the sort we are living through. In the first instance, of course, the focus has to be on crisis management. That has included: acting as lender of last resort to illiquid but solvent financial institutions; providing liquidity support through the market; and acting as a market maker of last resort when a market becomes dysfunctional. During the crisis we and other central banks have been forced to undertake a much wider range of actions than we would normally contemplate, lending against a broader range of collateral and for longer tenors than usual, and intervening in markets where we do not usually operate. While many of the new facilities were invented on the hoof as the crisis unfolded and should become redundant once normality returns, they will nevertheless remain in the emergency toolkit in case of future need.

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<sup>2</sup> This uses Basel I risk weights, though it seems unlikely that measures of risk-weighted assets calculated under the Basel II or III rules would have performed that much better.

But once the immediate crisis has past, how can central banks foster the recovery? There is now ample evidence (IMF, 2009; Reinhart and Rogoff, 2009) suggesting recoveries after recessions associated with financial crises are typically much more drawn out than those after “normal” recessions. For instance, a study by the IMF of 122 post-war recessions across 21 countries finds that, on average, output surpasses its pre-crisis peak around a year after the start of a “normal” recession. But that average period rises to 2½ years following financial crises. And the mean level of output across the 15 recessions associated with financial crises is still some 6% below a continuation of the pre-crisis trend some seven years after the onset of the crisis (though there is considerable heterogeneity in individual country experience, as Chart 3 shows).

Why are downturns after financial crises more likely to result in a prolonged period of weak activity and elevated unemployment – a slump, in other words? There are, I believe, two main reasons. The first is the unduly sharp and sustained decline in confidence. Over-confidence and underestimation of risks during the pre-crisis boom gives way to extreme caution and a preference for safe, rather than risky, assets – a shock to “animal spirits”, if you like. When investment is costly to reverse, that is likely to result in a sharp reduction in capital expenditure (e.g. Dixit and Pindyck, 1994). Similar arguments apply to durable expenditures by consumers. The near-seizure of the international financial system after the collapse of Lehman Brothers administered a particularly large adverse shock to animal spirits.

Although that event is gradually receding into the past, it has been superseded by uncertainty surrounding the ability of the euro area to resolve the indebtedness and competitiveness problems of the periphery. Substantial policy steps have been taken since the summer, including the launch of the European Stability Mechanism, steps to set up a banking union, and the ECB’s announcement of its willingness to purchase the short-dated debt of troubled sovereigns. But it will be a long time before a resolution is complete and the consequent uncertainty is likely to weigh on demand for some time yet.

The second reason why recovery is likely to be slow after a banking crisis, highlighted by those such as Richard Koo (2003), is that the excess debt and investments built up in the preceding period of over-optimism need to be worked off. And that process of balance sheet repair – by households, businesses and financial institutions – typically takes time and involves a period of subdued demand unless the spending of other, less indebted, agents rises to compensate.

Unlike some other countries which saw substantial rises in house prices during the years preceding the crisis, the United Kingdom did not see a major boom in residential construction (Broadbent, 2012). As a result, the overhang of unsold properties needing to be worked off was much smaller here than in, say, the United States or Spain. Even so, households that had taken out relatively large mortgages might have been more inclined to cut back their spending when conditions deteriorated in 2008–9 as the financial crisis worsened. Some support for this hypothesis is provided in Chart 4, which exploits microeconomic data from the Living Costs and Food Survey to examine consumption patterns by income quartile, split by the indebtedness of households. It is striking that the sharpest falls in consumption were seen amongst high income, highly indebted households, though there may be other explanations for this too.

The most important process of balance sheet repair is, though, taking place within the financial sector itself. As we saw in Chart 1, the pre-crisis period saw a considerable increase in leverage in the financial sector, leaving banks and similar institutions highly exposed when optimism evaporated. Bank funding costs and credit default swap spreads then rose substantially, symptomatic of investors’ doubts as to whether they would get their money back (Chart 5). Funding costs have recently fallen back in the wake of policy initiatives, such as our Funding for Lending Scheme, though doubts still linger. So, quite independently of any tightening of regulatory requirements, there has been market pressure on banks to make

balance sheets safer. That, in turn, has encouraged them to direct their supply of loans to just the more credit worthy borrowers. Moreover, elevated funding costs have also put upward pressure on the loan rates charged to borrowers, offsetting the impact of lower policy rates.

The drag from these factors – heightened uncertainty and de-leveraging – has been augmented by two further factors. First, higher prices for oil and other commodities, on the back of firm growth in the emerging economies and adverse supply developments, implied a deterioration in our terms of trade, imparting a further drag to the growth in real incomes. Second, as MPC members noted frequently in the years before the crisis, the composition of UK demand needed to re-balance away from domestic demand towards net exports in order to shift the current account into balance. On top of that, the financial crisis has most likely resulted in some deterioration of the capacity of the financial sector to generate export earnings, creating a need for an additional expansion in the rest of the tradable sector of the economy. Generating this shift in the composition of activity requires a real depreciation of sterling. While that has happened – the real effective exchange rate for sterling is almost 15% below its pre-crisis level – it will inevitably take time for resources to transfer to the tradable sector from the domestically-facing sector. Moreover, weak growth in most of the other advanced economies has not provided the best of backgrounds for such a re-balancing.

The bottom line of all this is that considerable real adjustments are called for. These real adjustments – balance sheet repair and the sectoral reallocation of resources – inevitably take time. It is against this background that monetary policy needs to be set. On the one hand, a highly stimulatory policy stance can encourage households and businesses to bring forward expenditure, boosting demand and mitigating the destruction of the economy's supply capacity that can result from a prolonged period of weak demand as firms are driven out of business and the skills of unemployed workers atrophy. On the other hand, such policy can also delay the transition to a new growth path if it slows the process of balance sheet repair and inhibits the process of “creative destruction” as unprofitable firms are closed and the liberated resources shifted to the expanding sectors.

Monetary policy has, of course, been highly stimulatory here and in other advanced economies since the financial crisis. Not only are policy rates close to their zero lower bound, but the Bank of England, US Federal Reserve and Bank of Japan have all engaged in large-scale asset purchases of government debt and selected private assets, paid for by an expansion in bank reserves – what is commonly referred to as “quantitative easing” . And while their open market purchases have typically been sterilised, the ECB's policy of full allotment in the provision of liquidity means its balance sheet too has expanded substantially in size (see Chart 6).

Quantitative easing is often described as “printing money” but this is somewhat misleading, as it conjures up images of Friedman's monetary helicopter – of which I will say more in a moment. Rather, in our case it swaps one liability of the state – gilts – for another – claims on the Bank of England in the form of commercial bank reserves. When we buy a gilt from the private sector, say a pension or hedge fund, we credit the seller's bank account with the appropriate amount, while their bank simultaneously acquires a claim on us in the form of an increase in its reserve account. These reserves bear interest at Bank Rate. As far as a bank is concerned, reserves are a very close substitute for holdings of short-term safe assets, such as Treasury Bills.<sup>3</sup>

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<sup>3</sup> There are two differences compared with a Treasury Bill: first, only banks with reserve accounts can hold bank reserves, whereas a Treasury Bill is a marketable instrument; second, if a bank needs cash, say to meet withdrawals, it can convert its reserve holdings directly into cash, whereas it would need either to sell or repo its Treasury Bill holdings in the market.

The aim of quantitative easing is to drive down longer-term yields, when short-term interest rates are already at or near their floor. It does this by encouraging those who have sold assets to us to rebalance their portfolios into assets that are substitutes. That includes corporate bonds and equities, as well as a variety of other assets. There is a line of academic thinking that this mechanism will not be effective if private agents “pierce the public sector veil” and internalise the tax implications of the change in the composition of the consolidated public sector balance sheet (Eggertsson and Woodford, 2003). However, event studies of quantitative easing here (see Joyce et al., 2011) and in the United States (see Gagnon et al., 2011) do suggest that yields on a range of assets have fallen as a result of the purchases. That can be seen in the downward pressure on corporate bond yields (Chart 7) and the upward pressure on equity prices (Chart 8) during the two rounds of asset purchases (marked in grey). So, as yet, we do not seem to be in a liquidity trap in which yields can be pushed down no further.

What to my mind is a more open question, though, is the degree of traction these lower yields have on demand at the present juncture. Looser monetary policy works in large part by encouraging households and businesses to bring forward future spending to the present. It is plausible, however, that such intertemporal substitution will be weaker when uncertainty is elevated and when banks and some households are concentrating on repairing their balance sheets. For instance, a modest fall in the cost of capital may do little to boost investment spending when the environment is so dominated by uncertainty about the outlook for demand. To illustrate this, Chart 9 shows the results from CBI business surveys of the factors holding back investment spending at the current juncture. Uncertainty about the outlook for demand is far and away the dominant factor. That does not mean that quantitative easing is impotent, as demand will still be affected by the wealth effect from the higher asset prices, as well as by any related exchange rate depreciation. But I think there are reasons to believe the effect of lower yields may be weaker than usual at the current juncture (in old speak, the IS curve may be quite steep, even though the LM curve may not be absolutely flat).

The weakness of the recovery has led some people to suggest that we could increase the effectiveness of quantitative easing by directing the money used to buy the gilts to buying private sector assets instead, or else to inject purchasing power more directly by passing it directly to households in the manner of Friedman’s famous helicopter. Such options can always be split into two legs: a fiscal leg, involving some bond-financed public expenditure and which ought to be subject to the control of the Chancellor and the Treasury; followed by a second monetary, or financing, leg in which the Bank buys the corresponding quantity of government debt on the secondary market and is just conventional quantitative easing.

Viewing it this way is, I believe, helpful as it allows one to focus on the merits of the alternative use to which the funds are put. For instance, the easiest way to implement a “helicopter drop” would be to increase tax allowances temporarily. But the life cycle/permanent income model of consumption behaviour suggests that one should expect the vast majority of such a temporary windfall to be saved rather than spent. It certainly is not the obvious way to try to boost demand, unless one can direct the additional income to credit-constrained consumers who are more likely to spend it. In any case, the design of any fiscal intervention does not need to be tied to the question of how the financing is split between money and bonds.

This leads naturally to a related question which has been the object of recent press commentary, namely should the Bank’s holdings of gilts just be cancelled? The idea is that this would relieve the Government of having to levy the taxes to pay both the coupons on the gilts and the principal when it falls due. Government debt would fall at a stroke of the pen, apparently relieving the future burden on the taxpayer.

Unfortunately this is not as good an idea as it sounds. Cancelling the gilts would deprive the Bank of the assets it needs to sell back to the market in order to suck the bank reserves out

when the time comes to unwind the policy. It would also deprive the Bank of the wherewithal to pay the interest on the reserves in the meantime, so we would need either to keep Bank Rate perpetually at zero or else be willing to continue issuing additional reserves indefinitely in order to meet our obligations. One can easily see how this would eventually lead to inflation taking off.<sup>4</sup>

In any case, it is not really clear why one would want to go down the route of cancelling the gilts. In undertaking quantitative easing, we are, for a period, replacing part of the government gilt stock with a monetary liability paying Bank Rate; cancelling the gilts is tantamount to making that period indefinite. In contrast, under present arrangements, how long that period lasts will depend on macroeconomic conditions. The inflation target dictates that we should continue to buy gilts (or other assets), including reinvesting maturing gilts, so long as inflation is more likely than not to undershoot the inflation target in the medium term. And it also dictates that we should sell them when inflation is more likely than not to overshoot the target. Making gilt sales/purchases contingent on the economic environment must surely be the right way to set policy.<sup>5</sup>

My first seven years at the Bank coincided with one of the most tranquil periods in British macroeconomic history. The past five years since the eruption of the global financial crisis have been anything but. It has been a challenging but humbling experience. We knew less than we thought. And we forgot some of the lessons of history. As a result of the crisis, we have found ourselves providing liquidity support in unexpected ways, deploying unconventional monetary policies in alien circumstances, and developing a whole new lexicon of macroprudential policies. Although it will be some time before the post-crisis adjustment is complete, normality will eventually return. Hopefully we will then be in a position to leave our successors both wiser and with a better toolkit to deal with similar challenges in the future. Thank you for your time.

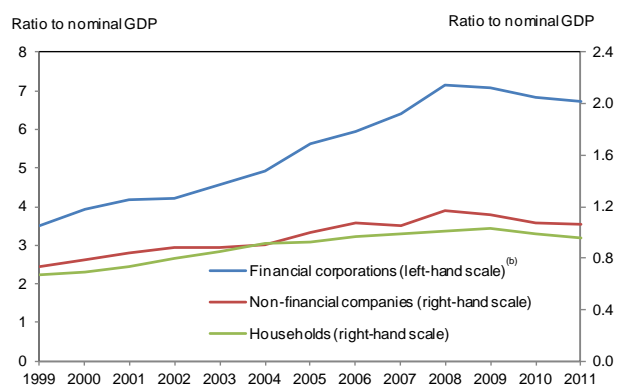
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<sup>4</sup> It should also be borne in mind that the Asset Purchase Facility, the vehicle through which the gilts are purchased, is indemnified by the Treasury, while the Treasury will also receive any surplus that results from the transactions. Consequently the coupon payments on the gilts, net of the interest on the bank reserves used to purchase them, is ultimately owned by the Treasury; they are not “lost” to the taxpayer in any sense.

<sup>5</sup> Making the monetary financing permanent by cancelling the gilts independently of the economic environment is essentially a step towards a world of “fiscal dominance”, where fiscal policy constrains monetary policy and ultimately determines the price level, as in the classic work of Sargent and Wallace (1981).



**Chart 1: Total stock of UK debt by sector<sup>(a)</sup>**



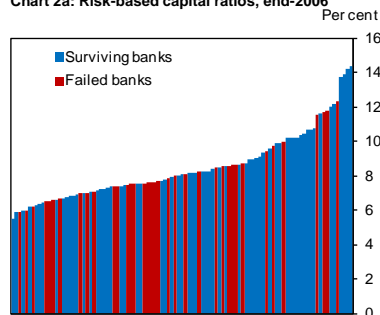
(a) Includes deposits, bonds and loans but excludes derivatives.

(b) Includes monetary financial institutions, other financial intermediaries and financial auxiliaries, and insurance corporations and pension funds.

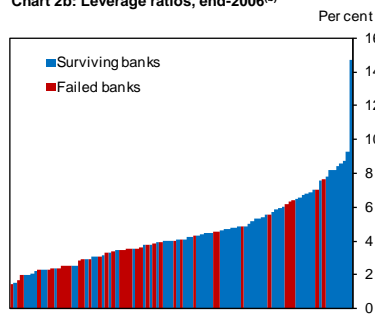


**Chart 2: Capital and leverage ratios of major global banks<sup>(a)</sup>**

**Chart 2a: Risk-based capital ratios, end-2006**



**Chart 2b: Leverage ratios, end-2006<sup>(b)</sup>**



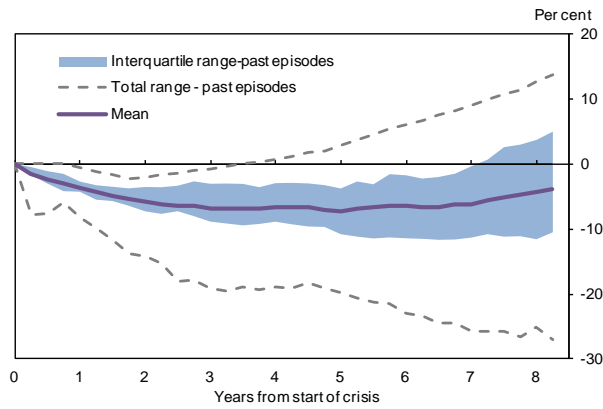
Sources: Capital IQ, SNL, published accounts, Laeven and Valencia (2010) and Bank calculations.

(a) The classification of bank distress is based on Laeven & Valencia (2010), updated to reflect failure or government intervention since August 2009.

(b) Total assets have been adjusted on a best-efforts basis to achieve comparability between institutions reporting under US GAAP and IFRS.



**Chart 3: Output losses relative to trend after financial crises<sup>(a)</sup>**

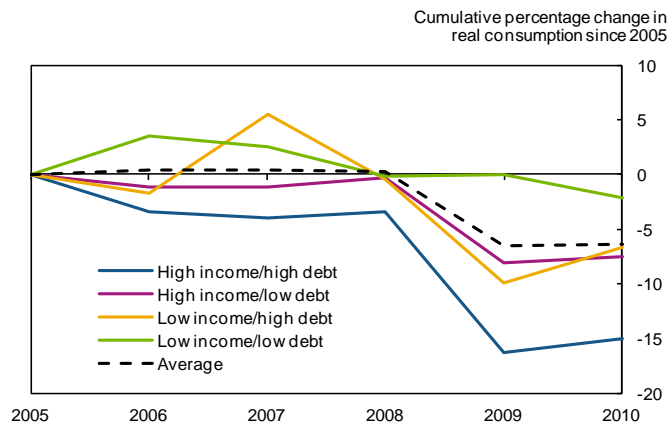


Sources: IMF and OECD.  
 (a) The episodes examined are taken from IMF (2009).



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**Chart 4: Real consumption of high and low debt households<sup>(a)</sup>**

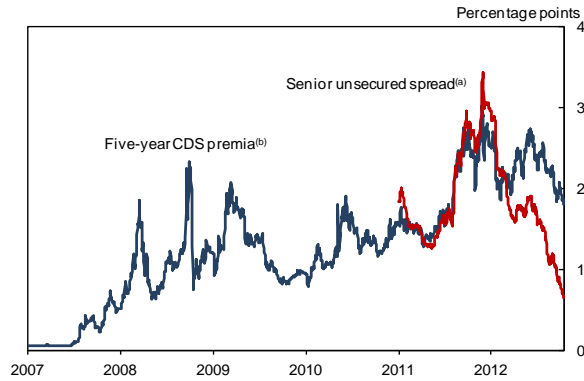


Source: Living Costs and Food Survey.  
 (a) 'High income' households are those in the top 50% of the income distribution. 'High debt' households are those with a debt-to-income ratio at or above three.



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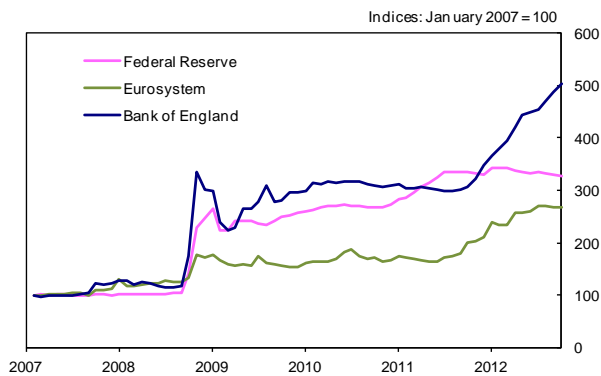
**Chart 5: UK banks' indicative long-term funding spreads**



Sources: Bloomberg, Markit Group Limited, Bank of England and Bank calculations.  
 (a) Unweighted average of the spread between euro-denominated senior unsecured bonds and equivalent maturity swap rates for bonds issued by the major UK lenders, which have a residual maturity of between two and six years.  
 (b) Unweighted average of the 5-year CDS premia for the major UK lenders: an indicator of the spread on long-term wholesale bonds.



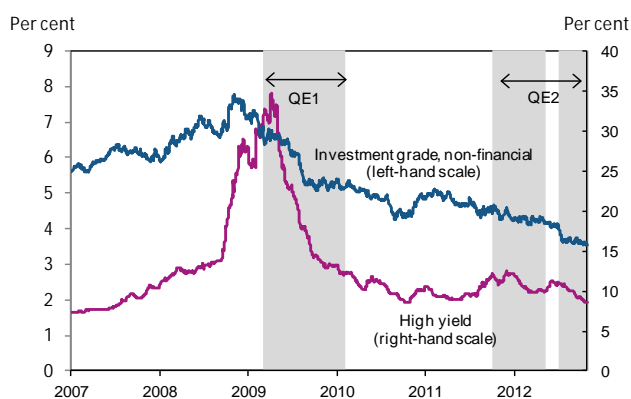
**Chart 6: Central bank balance sheets(a)**



Source: Bloomberg.  
 (a) In local currency.



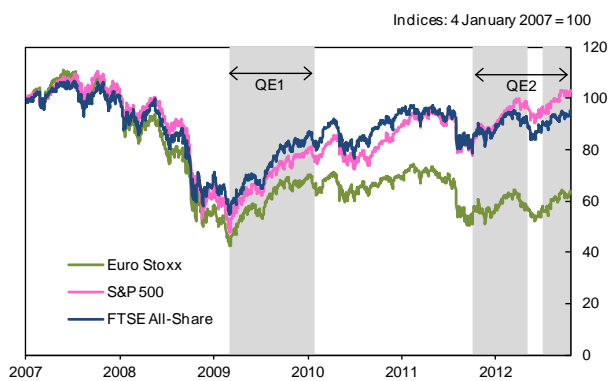
**Chart 7: Sterling corporate bond yields**



Source: Bank of America/Merrill Lynch.



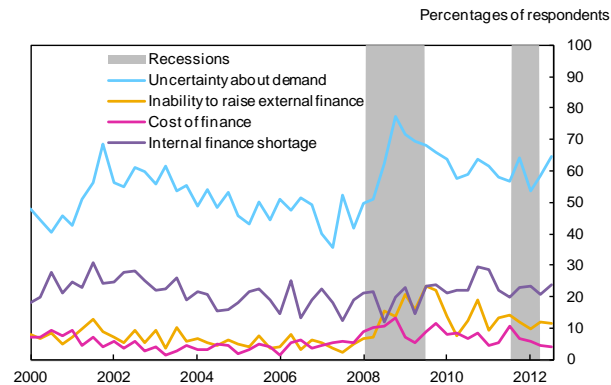
**Chart 8: International equity prices<sup>(a)</sup>**



(a) In local currency terms.



**Chart 9: Constraints on investment spending<sup>(a)</sup>**



Sources: CBI, CBI/PwC and ONS.

(a) Manufacturing, financial services and consumer/business services surveys weighted by shares in real business investment. Companies are asked for factors likely to limit capital expenditure authorisations over the next twelve months. Financial service companies are not asked to distinguish between a shortage of internal finance and an inability to raise external finance, so their single response is used for both questions.



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