



BANK OF ENGLAND

Speech

Central Banking Then and Now*

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International Centre for Monetary and Banking Studies, Geneva
Tuesday 25 October 2011

* First given as the Sir Leslie Melville Lecture, Australian National University, Canberra, Tuesday 12 July 2011, available at <http://www.bankofengland.co.uk/publications/speeches/2011/speech510.pdf>.

Good evening and thank you for that very warm introduction! It is a great pleasure to be invited to give this address at the International Centre for Monetary and Banking Studies here in Geneva.

I joined the Bank of England from academia a little over a decade ago, in October 2000. While my first seven years turned out to be an unusually tranquil period for the economy – the tail end of the so-called Great Moderation – the past four years have been anything but. So tonight, I thought I would discuss some of the lessons that central bankers should draw from the Global Financial Crisis of 2007-8 and the subsequent Great Recession.

The distinctive feature of a central bank derives from its role as the monopoly supplier of outside money, comprising notes and coin and commercial banks' reserve deposits. These constitute the ultimate settlement asset for an economy and mean that a central bank has a unique ability to create or destroy liquidity through the use of its balance sheet. The primary objective is to ensure that the supply of that liquidity is consistent with the smooth functioning of the real economy. From this follows the two core tasks of a central bank: the maintenance of broad stability in the price level, nowadays often enshrined in a formal numerical target for inflation; and supporting the process of financial intermediation during times of stress, including acting as Lender of Last Resort to solvent, though temporarily illiquid, financial institutions.

Of course, central banks sometimes carry out other tasks too. The Bank of England, for instance, manages the government's foreign exchange reserves and used to manage our national debt. And in some countries, central banks are responsible for banking supervision. But such tasks do not by their nature have to be carried out by the central bank.

Charts 1 and 2 show the balance sheets of the Bank of England and the US Federal Reserve¹ during the crisis. The near-tripling in size is striking, reflecting operations in pursuit of both the financial and monetary stability objectives. Before the crisis, central banks provided predominantly short-term loans to banks against generally only the safest collateral, mainly highly-rated government debt. But when financial intermediaries found their sources of finance drying up, particularly after the collapse of Lehman Brothers, we began providing larger loans, of longer tenors, against a wider range of collateral; the Federal Reserve also dealt with a broader range of counterparties. The same is true of the central banks of other countries caught up in the maelstrom.

This leads me to my first general lesson: *in a crisis, central banks need to show flexibility.*

The demand for many of these support programmes wanes naturally as conditions normalise, but the crisis has also prompted permanent changes in monetary frameworks. For instance, the Bank of

¹ The US Federal Reserve's outright securities holdings before the initiation of large-scale asset purchases on 18 March 2009 are included in the 'Other' assets category and held constant at the level on this date for the remainder of the period.

England has introduced regular auctions of liquidity in which loans can be secured against either the safest collateral or, at a cost, a wider collateral set, including high-quality private securities. An increase in bids offering the wider collateral as security then provides an early warning of financial stress.

More recently, the movements in the size and composition of our respective balance sheets reflect transactions carried out for monetary policy purposes, especially our large-scale purchases of government debt (and, in the US case, also government-backed GSE debt and mortgage-backed securities) financed by the issuance of reserves. Commonly called 'quantitative easing', I shall say more about the efficacy of these operations later.

Before the crisis, central banks saw these two objectives of monetary and financial stability as largely complementary in nature. According to the conventional wisdom, the maintenance of price stability would help foster stable macroeconomic conditions more generally by anchoring expectations. And the consequent reduction in macroeconomic volatility should help reduce the likelihood of episodes of financial instability. All that was necessary, then, was to ensure that banking regulators and supervisors ensured individual financial institutions followed appropriately responsible policies with regard to their lending decisions and were sufficiently well capitalised and all would be well.

We know now that this confidence was misplaced. For many advanced economies, the decade and a half leading up to the financial crisis was indeed a period of unusual macroeconomic stability, with low and stable inflation accompanied by steady growth – the Great Moderation. Inflation targeting and similar price-stability oriented monetary policies appeared to have delivered the goods. But in a number of countries – most obviously the United States, but also including Australia, Ireland, Spain and the United Kingdom – this period was also characterised by rapid credit growth and property price inflation, sowing the seeds of future problems (Chart 3).

Now many factors contributed to the severity of the subsequent financial crisis. A non-exhaustive list includes: the development of complex securities which were impossible to value in stressed conditions and which connected financial institutions in unexpected ways; disguised leverage through the use of securitisation vehicles, whose real aim was regulatory arbitrage; remuneration packages encouraging positions that generated decent returns most of the time but high losses in some states of the world; excessive reliance on credit-rating agencies; defective risk management; and insufficient high-quality capital to absorb losses when they materialised.

But macroeconomic conditions possibly also played a part². Far from fostering financial stability, the Great Moderation may itself have contributed to the build-up of credit and the adoption of risky positions by leading investors to underestimate potential macroeconomic risks. And commentators,

² The potential role of high global savings and the consequent downward pressure on long-term interest rates is another factor often mentioned (Ben Bernanke, 2005).

such as John Taylor (2009) and Bill White (2009) have blamed excessively loose monetary policy during the years leading up to the crisis. Low policy rates boost credit growth and asset prices in conventional accounts of the monetary transmission mechanism, but recent work has also highlighted the potential for low safe interest rates to encourage a shift into riskier assets (for example Claudio Borio and Haibin Zhu, 2008)³. While the contribution of monetary policy to the crisis is controversial – I shall say a bit more on this later – I find plausible the idea that the long period of relative macroeconomic stability lulled investors into a false state of security.

This leads to my second lesson from the crisis: *the achievement of price stability does not guarantee the maintenance of financial stability and, without further measures, may possibly even compromise it.*

My next lesson follows on from this and relates to deficiencies in our analytical framework. The canonical macroeconomic model for thinking about the design of monetary policy is that of the New Keynesian synthesis (see Richard Clarida, Jordi Gali, and Mark Gertler, 1999; Michael Woodford, 2003). This focuses on the consequences of real and nominal rigidities in goods and labour markets, which give rise to a short-run trade-off between inflation and activity. The dynamic stochastic general equilibrium models in use in many central banks typically embody this synthesis, though usually with quite a few knobs and whistles added on. Moreover, the optimal monetary policy rule in these models looks rather like flexible inflation targeting: the central bank aims to offset completely shocks to aggregate demand, but accepts temporary movements in inflation in the face of shocks to supply so as to limit the volatility in output.

Financial intermediaries are conspicuous by their absence in these models. That is not to say that mainstream macroeconomists and monetary policy makers had ignored financial considerations altogether. It had long been understood that financial frictions could affect both the evolution of the economy and the monetary transmission mechanism. But these frictions typically served merely as modest amplification and propagation mechanisms, rather than a potential source of fundamental disturbance to the economy. One example is the 'financial accelerator' arising from monitoring costs which give rise to a relationship between the external finance premium paid by a borrower and their financial health (see Ben Bernanke, 1983). The behaviour of intermediaries was thus seen as being of marginal relevance to the understanding of macroeconomic fluctuations. And many analyses ignored financial imperfections altogether, assuming that that the transfer of funds from savers to borrowers was both frictionless and efficient.

To see why the behaviour of financial intermediaries is potentially so important, note that most financial crises have been characterised by two features. The first is an excessive expansion of credit

³ This could come about through: conventional asset substitution; an attempt by investors, such as pension funds, to maintain returns in order to match their commitments (Raghuram Rajan, 2005); or a movement down the risk spectrum as banks expand loans in order to maintain leverage as the value of their existing assets, and therefore also of bank equity, rises (Tobias Adrian and Hyun Shin, 2009).

during the prelude to a crisis, perhaps prompted in the first instance by some innovation⁴ or other beneficial economic development. The second is a mismatch between the maturities and/or currencies of the assets and liabilities on either side of the balance sheet.

Consider a simplified bank balance sheet, shown in Chart 4, with the bank's holdings of loans, securities and reserves financed by a mixture of: (insured) deposits; other debt of various forms, including borrowing from other financial institutions collateralised against the bank's assets, repurchase agreements, unsecured bank debt; and finally equity capital. This last category is the initial absorber of unexpected losses and is a key determinant of sustainable balance sheet size and thus of the supply of credit to the economy. That is, by the way, rather different from the standard textbook model, in which banks' holdings of reserves and loans are financed solely by deposits and the size of the bank's balance sheet is determined by the product of its holdings of reserves and the money multiplier. Since short-term finance is typically cheaper than long-term finance, profit-maximising intermediaries have an incentive to finance their illiquid long-term loans by potentially footloose short-term debt, relying on their ability to roll that debt over when it matures, or to find similar alternative funding sources. Moreover, the latest episode of financial instability was also preceded by increased reliance on short-term wholesale funding, which proved more prone to flight than traditional retail deposits.

Now suppose that the returns on the bank's loans turn out less than expected or the value of its securities falls. That could be the result of a macroeconomic shock or just reflect a correction to initially over-optimistic expectations. Then the bank's net worth also falls, reducing the buffer available to cover any further unexpected losses, potentially raising the costs of unsecured debt. Moreover, the collateral available to back secured debt also shrinks.

Suppose the bank initially held assets worth twenty times the value of its equity and assume that it wishes to restore that degree of leverage (in practice, a deterioration in macroeconomic conditions might also lead to lower desired leverage). Then the bank is faced with either reducing its assets or increasing its equity. If it pursues the former strategy, then it would need to reduce its assets by twenty times the amount by which its capital has fallen. Moreover, by depressing the prices of those assets, such a fire sale also impairs the balance sheets of other banks, amplifying the effect of the shock. The same is true if banks seek to repair their balance sheets by cutting back on the extension of credit: less credit implies lower activity and greater loan losses. Fire sales and credit crunches can thus greatly amplify a financially-driven downturn. And both have played a role in the latest crisis.

Assuming that policymakers are not actively seeking a reduction in the supply of credit, shrinking the balance sheet leads to an unsatisfactory outcome from a macroeconomic perspective. Injecting additional equity capital would be preferable. But while banks may be prepared to do this over time,

⁴ Though Adam Posen (2010) notes that equity booms precipitated by technological innovations are typically less costly than real estate booms.

by cutting dividends to shareholders or reducing staff compensation, they are typically reluctant to raise new capital directly in such circumstances. In part, that is because the benefits of extra capital accrue initially to existing debt holders who will consequently be less likely to suffer losses. Moreover, investors may see additional injections of capital as a signal that the bank is in difficulties. In sum, there is a collective action problem. Mandatory stress tests coupled with forced re-capitalisation is one possible solution to this collective action problem. This is, of course, all very relevant to the agreement by the European Council this weekend to force Europe's major banks to acquire extra capital in order to cover the market's perception of the potential losses on troubled euro-area sovereign debt.

So my third lesson is: *financial intermediation needs to be brought into mainstream macroeconomic analysis.*

That such a lesson should even be necessary may be somewhat surprising giving the frequency of financial crises around the globe in recent years; see Chart 5 taken from the work of Rong Qian, Carmen Reinhart and Ken Rogoff (2010). Introducing – or rather re-introducing – financial considerations to the analysis of macroeconomic fluctuations would also be returning the study of the business cycle to its historical roots.

This task is already well under way in academia and I suspect the field of macroeconomics will look very different in a decade or so. We are, though, still in the foothills. But to give a broad-brush flavour of how financial intermediaries might affect things, we can look to the graphical extension of the New Keynesian model recently offered by Woodford (2010).

The left-hand panel of Chart 6 shows the demand for funds from ultimate borrowers, LB, together with the total supply of loanable funds from savers, LS. The former is a decreasing function of the cost of borrowing, RB, while the latter is an increasing function of the return on savings, R. For simplicity, I shall take this to be the return on deposits and the same as the central bank's policy rate. The marginal source of funds to intermediaries, however, is likely to be in the wholesale markets and, if unsecured, these will need to offer a higher return to compensate for the associated default risk.

In the standard model with costless financial intermediation, the loanable funds market clears at A and the borrowing and saving rates are equal. If intermediation is costly, however, a spread, S, opens up between the two and the volume of loans will be lower, at L. Relating L to this spread then generates a demand for intermediated funds as a decreasing function of the spread: the XD schedule in the right-hand panel of Chart 6.

To determine the value of this spread, we then need a model of the supply of intermediation services, XS. Given our earlier discussion, this is just the net worth of the intermediaries multiplied by their desired leverage. Desired leverage is, in turn, likely to be higher the greater is the spread between

the return on investments and the cost of funds. It is also likely to be lower the greater the degree of uncertainty about the environment. So the schedule will be upward sloping, and lie further to the right, the higher is bank capital. Moreover, the schedule should be flat for low levels of leverage, as the prospect of bank creditors losing money is then negligible and the spread just needs to cover the actual costs of intermediation, such as running a branch network. But as leverage rises, so there is an increasing risk of loss to creditors and the interest rate paid to the suppliers of unsecured bank debt needs to reflect that. If the state is believed to guarantee all bank debts, then XS will be flat. Finally, the schedule will become vertical when the capital ratio, which in this simple set-up is just the inverse of the leverage ratio, reaches its regulatory minimum. The equilibrium spread is given by the point of intersection, B .

During the upswing phase of a credit/asset-price boom, perceptions of macroeconomic risk tend to be low. Moreover, rises in asset prices also boost bank net worth. In sum, the health of the banking system is not in doubt and the upward sloping part of the XS schedule will tend to be a long way out to the right. But when the boom turns to bust, the associated unexpected losses lead to falls in bank equity, reducing the supply of credit. Moreover, people's subjective perception of the macroeconomic risk blows out, reducing desired leverage. The XS schedule moves inwards, to XS' , while the equilibrium spread rises to S' . That in turn pushes the rates of return on savings down to R' and the cost of borrowing up to RB' and the volume of loans down to L' . The fire sale externalities referred to earlier can then greatly amplify this contraction in credit supply by generating further losses in the net worth of intermediaries.

The consequences of all this for output are shown in Chart 7. On the usual assumption that savers save a fraction of any increase in income, the supply of funds from savers will be increasing in output, generating the usual downward-sloping relationship between output and the policy rate, IS . Its location, however, also depends on the spread, S , with the boom phase of the credit cycle leading IS to shift outwards and the bust phase shifting IS inwards.

To complete the story, we just need to add a description of monetary policy. Assuming inflation starts off at target, an inflation targeting central bank will seek to hold the level of demand at potential, so monetary policy is described by MP . In the face of a credit boom, the central bank would then raise the interest rate to negate the expansionary effect on demand, and cut it in the face of a credit bust. The corresponding aggregate demand schedule, incorporating the endogenous policy response, is given by AD in the right-hand panel, together with a conventional upward-sloping aggregate supply schedule, AS ; for simplicity, I ignore the possible impact on the supply of goods of changes in the price and availability of credit.

A central implication of this analysis is that while it suffices to think in terms of a single representative interest rate in normal conditions, in times of stress the whole set of market rates need to be considered. Consequently, movements in the policy rate alone no longer provide an accurate

summary measure of monetary conditions. The importance of this is illustrated in Chart 8, which shows the recent paths of the policy rate in the United States and the United Kingdom, together with representative measures of the cost of bank debt and the corporate loan rate⁵. Before the crisis, the policy rate and marginal cost of funds were close together, with the spread of the loan rate above funding cost reflecting the cost of intermediation and the default risk. The onset of the crisis then pushed both market rates up relative to the policy rate as concerns about the solvency of financial intermediaries rose. Focusing on the policy rate alone overstates the degree to which the effective monetary stance loosened in the wake of the collapse of Lehman's.

A corollary of this, together with the severity and the duration of the downturn, is that policy is more likely to be constrained by the zero lower bound than previously thought. Ahead of the crisis, simulations with macroeconomic models suggested that, with an inflation target of 2 per cent, the zero lower bound would bind around 10 per cent of the time. The costs of this were pretty modest, however, because such episodes were likely to be short in duration (see e.g. David Reifschneider and John Williams, 2000). That analysis looks less persuasive now. Indeed a recent study by Williams (2009) suggested the ideal level of the US Federal Funds rate after the collapse of Lehman's would have been around minus 4 per cent⁶ and puts the cost of this constraint – ignoring the scope for other policies – at around \$1.8 trillion over 2009-2012.

Other policies are, of course, available. In the monetary sphere, that takes the form of purchases from the private sector of longer-term public and private securities, financed by issuing claims on the central bank. As we saw in Charts 1 and 2, both the Bank of England and the US Federal Reserve have already made substantial large-scale asset purchases, worth about 15 per cent of GDP in each case. The aim of such purchases is to drive down the yields on these and similar assets by increasing their scarcity, so boosting demand. Commonly referred to as 'quantitative easing', the moniker is somewhat misleading as it focuses attention on the associated reserve expansion, rather than the change in the portfolio composition of the central bank and private sector.

But do they work? Under Ricardian equivalence the answer would be No, as the associated transfer of risks from private sector balance sheets onto that of the public sector is matched by offsetting movements in future taxes (Gauti Eggertson and Woodford, 2003). Be that as it may, event studies by Joe Gagnon and others (2010) for the United States, and Mike Joyce and others (2010) for the United Kingdom, suggest that long-term bond rates in each jurisdiction fell by around 100 basis points as a result of the purchase programmes, though the ultimate impact on aggregate demand is harder to judge because of the difficulty in identifying the appropriate counterfactual. We have, however, made a stab at this in an article in our most recent *Quarterly Bulletin* (see Joyce, Matthew Tong and

⁵ The marginal funding cost is the three-month Libor plus the average of the five-year CDS premia of the major banks. The corporate loan rate is the three-month Libor plus the average of the spread on sub-investment grade syndicated loans.

⁶ If no other policies were available, then one might be tempted to conclude that the inflation target should just be higher in normal times, as advocated by Olivier Blanchard, Giovanni Dell'Ariccia and Paolo Mauro (2010). By ignoring the other policies that are available to deal with, and prevent, financial crises, to my mind this is giving up too easily.

Robert Woods, 2011). Using a variety of approaches, that piece suggests a peak impact from our £200 billion of asset purchases of 1½-2 per cent on GDP and ¾-1½ percentage points on inflation. Of course, there is inevitable uncertainty surrounding such estimates, but these effects do not seem altogether implausible.

From this I draw my fourth lesson: *central banks do not run out of ammunition when policy rates reach their zero lower bound.*

Despite that, as we have seen only too clearly, it is next to impossible to stabilise activity in the face of a financial crisis, as indebted households, businesses and intermediaries all seek to de-leverage simultaneously. Moreover, the upswing of the credit cycle is frequently associated with an increase in lending to purchase assets, especially property; that was certainly true on this occasion. If the consequence is an investment or construction boom – as was the case in the United States, Ireland and Spain – the result is a capital overhang that needs to be worked off. There are welfare gains from avoiding such capital misallocation.

That leads naturally to my fifth lesson: *prevention is better than cure.*

But what is the best way to do that? Could a different choice of monetary policies have led to a better outcome? Ahead of the crisis, there was a robust debate on whether monetary policy should seek to moderate credit/asset-price booms, as well as maintaining low inflation. On the one hand, the Bank for International Settlements and others (e.g. White, 2006; Stephen Cecchetti et al., 2002) argued that policy should be set tighter than justified by the inflation outlook so as to 'lean against the wind'. On the other hand, Chairman Greenspan and others at the Federal Reserve (Alan Greenspan, 2002; Bernanke et al., 1999) advocated only responding to such events in so far as they affected the immediate macroeconomic outlook, but acting aggressively to stabilise markets in the event of a correction. This reactive policy is sometimes referred to as 'cleaning', so as to contrast with the pre-emptive policy of 'leaning'. The Fed broadly followed such a 'cleaning' policy during the dot-com boom-bust.

Before the crisis, I stood some way between these two positions (Bean, 2003). On the one hand, a policy of leaning against the wind is perfectly consistent with the practice of flexible inflation targeting once it is recognised that financial instability usually results in a sharp contraction in demand and potential disinflationary pressure. Undershooting the inflation target in the near term could then enhance the chances of meeting it further out. On the other hand, there are practical obstacles to the implementation of a 'leaning' policy. In particular, such a policy involves accepting lower output in the short term in return for uncertain future gains and also runs the risk of precipitating the very collapse one is seeking to avoid.

The severity of the recession might appear to tilt the argument in favour of 'leaning', but the question still arises as to how effective such a policy would have been in restraining the boom in credit and property prices and at what cost to activity. Together with colleagues from the Bank (Bean et al, 2010), I recently attempted to investigate this question using simple vector autoregressive models of the US and UK economies. I will refer you to the paper for the details, but Table 1 shows the results of counterfactual simulations of a pretty aggressive 'leaning against the wind' policy, in which the policy rate is held around 200 basis points higher over the 2003-2006 period.

The simulations suggest that the peak in real house prices would have been about 7½% lower in the United States and some 20% lower in the United Kingdom. The impact on the stock of credit is, though, more modest: just 3-4% lower by the end of 2006. Moreover, the cumulative impact on activity is considerable, with output around 3% lower by the time the crisis begins. Clearly, then, the terms of trade for controlling the risks to financial stability through monetary policy *alone* do not look very favourable: even substantially higher interest rates over a sustained period would not have prevented the crisis. A similar conclusion is reached in recent studies by Bernanke (2010) and by Carmen Reinhart and Vince Reinhart (2011).

Moreover, restricting domestic credit expansion will not serve if the cross-border activities of banks result in their most vulnerable exposures originating overseas. That, of course, was the case in the present crisis, where the main losses to UK and European banks arose from holdings of securities linked to the behaviour of the US housing market. On top of that, a unilateral increase in interest rates may well end up having a perverse effect on credit growth, because it sucks in capital flows from abroad to take advantage of the interest differential, so boosting the real exchange rate and adding to the supply of funding to the banking sector.

The obvious conclusion is that one needs to look to other instruments – so-called macro-prudential regulation – which act directly against the expansion in credit during the upswing and limit the contraction in any bust; in other words they stabilise the supply of intermediation schedule, XS . Given our earlier discussion, an obvious way to do this is by raising capital requirements on banks during the upswing of the credit cycle and reducing them during the subsequent downswing. The new Basle III agreement on capital and liquidity regulation makes specific provision for such a countercyclical capital buffer of up to 2.5% of risk-weighted assets on top of the increased base Core Tier 1 capital ratio of 7%, i.e. a potential increase in capital requirements of more than a third.

Capital requirements and leverage constraints both affect the overall size of banks' balance sheets. But credit booms and busts are often associated with excessive lending to particular risky segments of the market. So instruments to affect the composition of balance sheets are also potentially useful, for instance through selective variation in the risk weights applied to the calculation of capital ratios. Quantitative controls applying to particular sorts of loans, such as maximum loan-to-value ratios on mortgages are another option, as are minimum haircuts on repo and similar financial transactions

between intermediaries. Finally, since excessive maturity mismatch is an aggravating feature of financial crises, banks could be asked to increase their holdings of reliably liquid assets as the risk of instability builds, in an analogous fashion to the capital buffer.

Macro-prudential policies are sometimes described as the missing instrument, but in reality many of these tools are familiar to regulators and there is already international experience in their application, often from emerging economies (though in some cases their application has been aimed at restraining aggregate demand rather than reducing the risk of financial instability).

The Australian experience nearly a decade ago constitutes one example. Over 2002 and 2003, house prices there rose nearly 40 per cent, stimulated in part by changes in the tax treatment of housing, increased competition in credit markets and the attainment of a low inflation macroeconomic environment; alongside this, there was a similarly rapid rate of expansion in mortgage lending (see Chart 3). The Australian Prudential Regulatory Authority (APRA) started signalling its concerns to bank executives during 2002 and in 2004 went on to increase the capital requirements on uninsured 'Low Documentation' loans. More generally, APRA was strict in ensuring that loan origination standards were maintained and banks made prudent provisions for losses. This robust regulatory response was complemented by a slightly tighter monetary stance and numerous 'open-mouth operations' by Reserve Bank officials that highlighted the growing risks in the housing and credit markets. The effect of these actions was to take some of the steam out of the housing market, thus ensuring that banks were in a better position to withstand the global financial crisis when it finally broke. (For a fuller discussion of the Australian experience, see Paul Bloxham, Christopher Kent and Michael Robson, 2011.)

Other examples of macro-prudential regulation in action include: successive increases in risk weights on commercial and residential property loans by the Reserve Bank of India during 2005-8; dynamic provisioning after 2000 in Spain; and quantitative constraints on mortgage lending in Hong Kong in 1994. And there are others. Like Molière's Monsieur Jourdain, some have been speaking prose all along; the rest of us just need to catch up.

The evidence suggests the effectiveness of these tools is, though, variable and we should therefore not expect too much from them (see Committee on the Global Financial System, 2010). Bankers have every incentive to figure out ways to minimise the impact of regulatory constraints, and activity is likely to shift outside the regulatory perimeter altogether if the restraints on behaviour are onerous. It may be possible to design policies which embed incentives to comply rather than evade, and smart supervision can help. But there could be occasions when tighter monetary policy is the only way to reach those parts of the financial system beyond the reach of regulation. In such cases, if other policies are not available, then 'leaning against the wind' may be the only option left to policymakers.

As the simple analytical framework I used earlier makes clear, tighter monetary policy reduces both aggregate demand and credit supply, while tighter regulatory policies do the same. But the empirical evidence suggests the impact of interest rates on credit is generally relatively weak, while capital and liquidity regulation have a very direct impact on leverage and maturity transformation and thus on the resilience of the financial system.

So my sixth lesson is: *both monetary and regulatory policies are required to maintain price and financial stability; moreover, monetary policy should remain focused on the control of inflation, while regulatory policies should be assigned to maintaining financial stability.*

Much is sometimes made of the risk of monetary and macro-prudential policies pulling in opposite directions if they are assigned to different agencies. Most of the time this should not happen, as both aggregate demand and credit market shocks will tend to push the two policies in the same direction. Differential movements are more likely to arise in the face of supply disturbances. For instance, a beneficial supply shock will tend to push inflation below target, warranting a looser monetary policy, while it may also encourage a credit boom, warranting tighter macro-prudential policies. But in any case, it is not clear that this is such a problem. The instruments address different distortions, so one should expect them to move in different directions from time to time. Moreover, the regulatory dials should be adjusted less frequently than policy rates, so co-ordination should not constitute that much of an issue⁷.

My concluding observations relate to the broader context within which macro-prudential policies are conducted. Credit booms are times when everyone feels good and risks seem slight. Taking the credit punch bowl away before the party gets out of hand will be controversial, and banks and borrowers will be quick to claim 'this time is different'. That is a good reason for delegation to a separate committee or agency with a longer perspective, much as we do with monetary policy. Even so, the pressures not to take action may be intense.

Making macro-prudential policies rule-based would be one response. But whereas measures of credit and leverage may together serve as useful portmanteau guides to latent risks in the financial system, a considerable degree of discretion is likely to be called for. So a rigid linkage of macro-prudential instruments to such indicator variables seems inappropriate. In the monetary policy sphere, we have the luxury of precisely defined measure of inflation against which the rationale for policy choices can be made. Unfortunately, we presently lack a similarly precise characterisation of the financial stability objective, so effective communication will be even more important than in the monetary sphere.

⁷ This is analogous to the relationship between monetary and fiscal policy, where the fiscal authority is in effect a Stackelberg leader.

Tonight I have offered you six lessons that I have taken from the crisis, though they are certainly not intended to comprise an exhaustive list. Back in my own country, the UK government has started reforms that seek to embed some of these lessons into the institutional framework. These include returning prudential supervision to the central bank and the creation of a Financial Policy Committee charged with protecting and enhancing the resilience of the UK financial system. We have now met twice, on each occasion issuing a small number of recommendations to our banking supervisor and to our banks. We are, though, conscious that we still have much to learn in operating this new framework, including from the experience of others.

My Governor, Mervyn King, is noted for having said that he aspired to make central banking 'boring'. Now apparently there is an old Chinese curse that wishes the recipient may live in 'interesting times'. The past four years have, I am afraid, been rather more 'interesting' than one would like and the current travails in the euro area mean that it is probably likely to continue to be so for a while yet. But maybe one day, before too long, central bankers can get back to being boring. Thank you!

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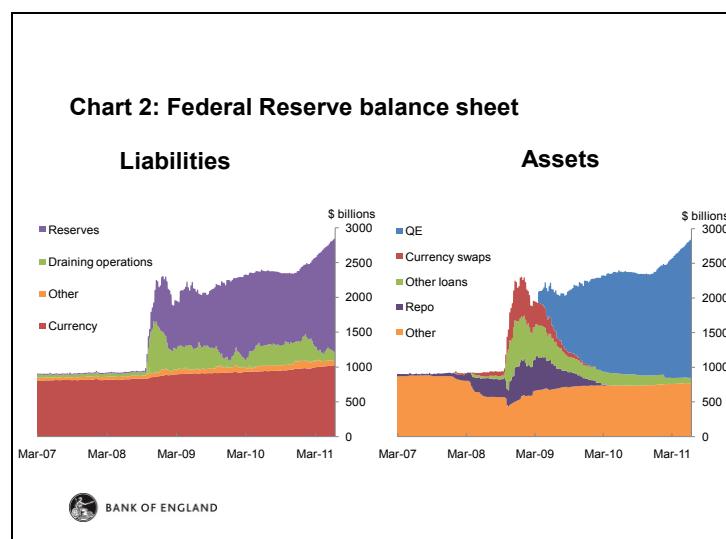
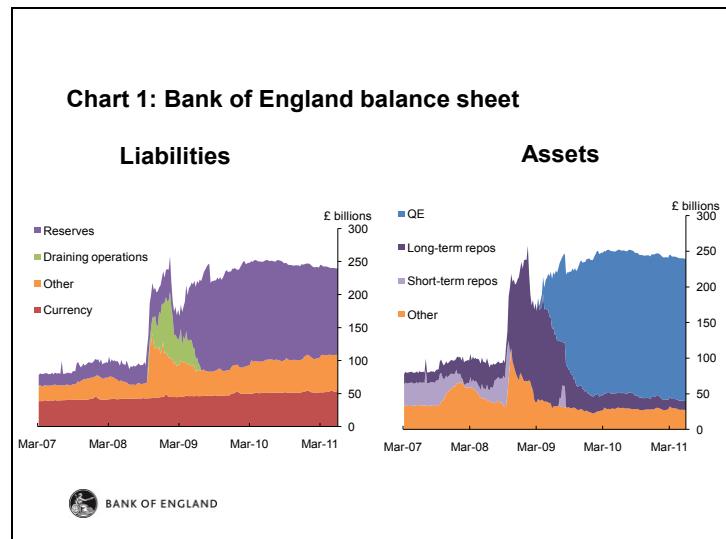
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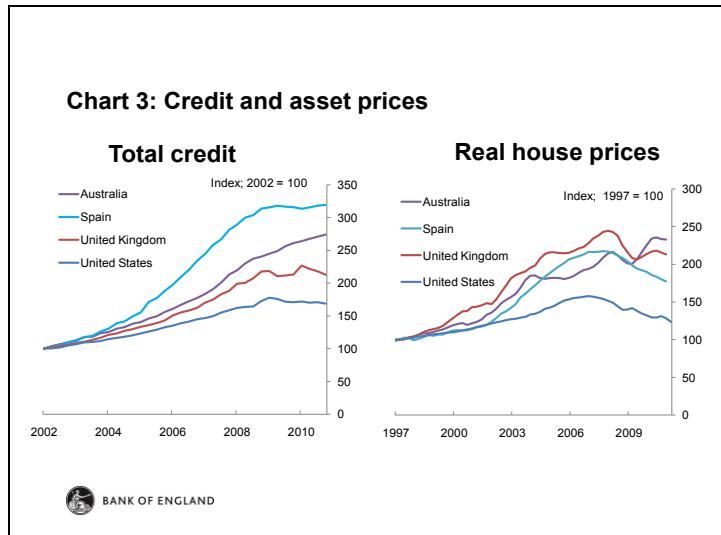
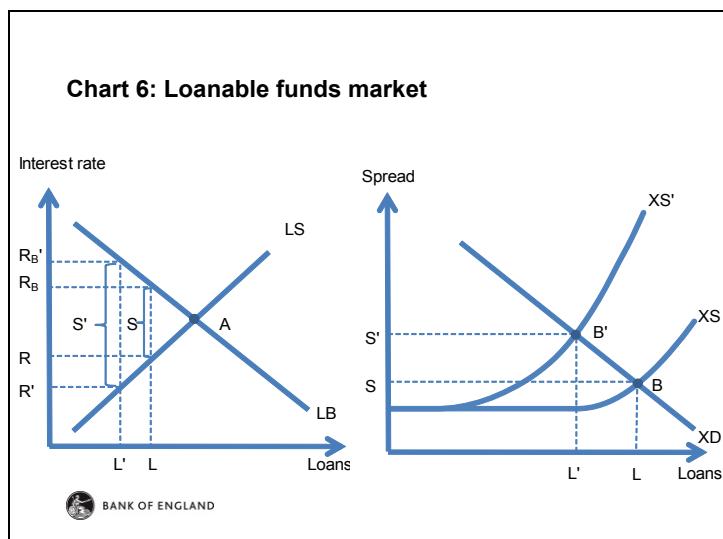
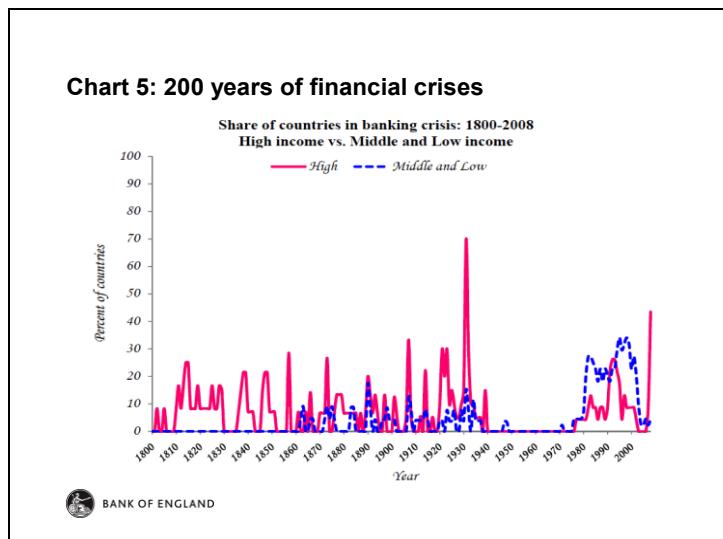


Chart 4: Simplified bank balance sheet

Liabilities	Assets
Deposits	Loans
Debt – <i>secured</i> <i>unsecured</i> <i>repo</i>	Securities
Equity	Reserves

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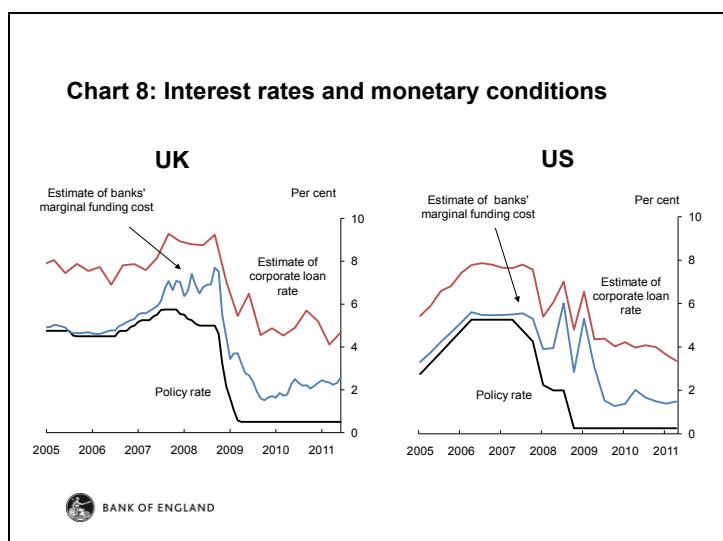
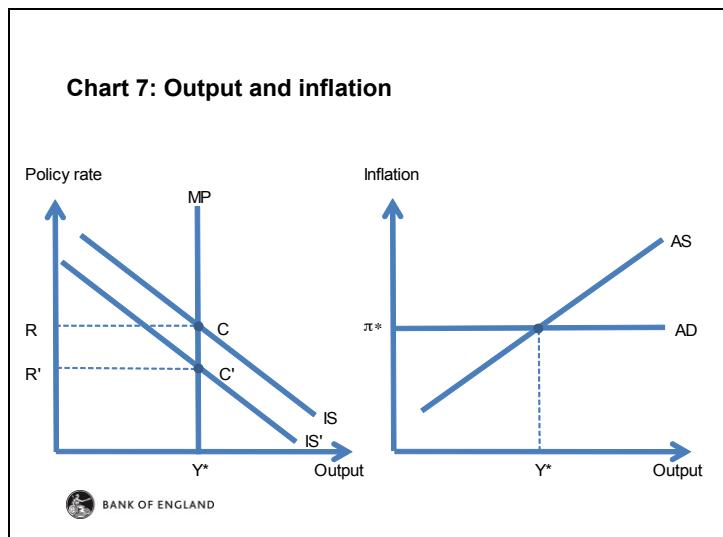


Table 1: A Leaning Against the Wind (LATW) Policy

	Real Stock of Credit (% change from 2003Q1)		Real House Prices (% change from 2003Q1)		Output (% change from 2003Q1)	
	Base	LATW	Base	LATW	Base	LATW
United States						
2005Q1	12.2	10.5	13.8	10.0	7.6	6.3
2007Q1	28.1	23.9	22.2	12.1	12.5	9.0
United Kingdom						
2005Q1	21.1	19.7	26.7	18.3	5.5	4.7
2007Q1	45.3	39.7	43.0	15.0	11.6	9.0

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