



BANK OF ENGLAND

# Speech

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## **Monetary policy and banking fragility**

Speech given by

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At the London School of Economics

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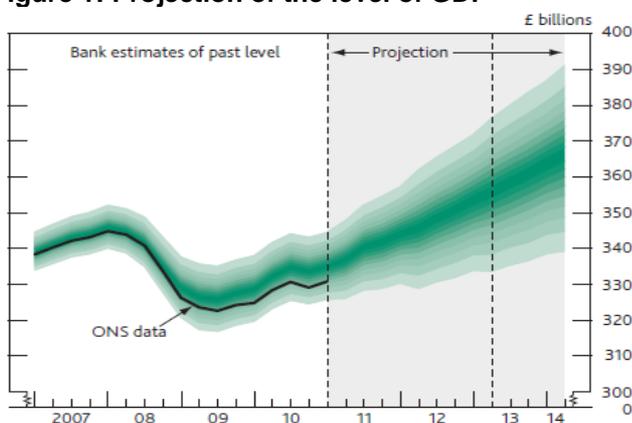
We are living in the aftermath of a major banking crisis. This crisis – which reached an acute point in the autumn of 2008 – was followed in many countries by a dramatic decline in economic activity and a huge widening in fiscal deficits. In some countries in Europe there is now a crisis of confidence in sovereign debt. For the UK, this was probably the most serious banking crisis in its history. In its wake output fell on a scale that was, on some measures, as serious as during the first stage of what we now call the Great Depression. It is likely to be the longest of the six depressions since the First World War.

The welfare losses are substantial. Had the UK economy in the period since 2007 continued to grow at its pre-crisis trend of about 2.5% per year, real GDP would now be about 10% higher (See Figure 1). Had that happened the average level of income created in this country over a year would now be higher by almost £6,000 for every household.<sup>1</sup>

Setting monetary policy in this environment has been problematic. I want to talk about those difficulties. My main aim is to assess whether one of the policies to make the entire banking system more robust – an increase in the banking sector’s long-run average level of equity capital – reduces the level of economic activity, lowering the path that GDP and employment will follow in the recovery from today’s crisis and making the task of setting monetary policy more difficult.

But let me begin by briefly considering how things have evolved since the banking system came close to complete breakdown.

**Figure 1: Projection of the level of GDP<sup>2</sup>**



Recovering from a recession that follows a banking crisis that was itself preceded by a very large expansion in credit is not easy. On average, households and firms taken together now repay more debt than they are taking on, thereby reducing their leverage. After public debt soared – reflecting both the operation of automatic fiscal stabilisers and support for the financial sector – a period of fiscal tightening has begun.

<sup>1</sup> Source: ONS and Bank calculations. The level of nominal GDP was £1.45trn in 2010; the estimated number of households in the UK is close to 26mn.

<sup>2</sup> Source: Bank of England *Inflation Report*, May 2011. This projection is based on market interest rate expectations and £200bn asset purchases.

Domestic demand is starting to be replaced by foreign demand, facilitated by the depreciation of Sterling in 2008.

Some of this rebalancing would have been necessary even in the absence of the banking crisis. The current account deficit was both substantial and had existed for much of the ten year period leading up to the crisis. The dramatic rise in household indebtedness could not have continued indefinitely. And the rise in the size of the balance sheets of UK banks and the levels to which their leverage had risen also look unsustainable.

But re-balancing is now happening when confidence is low, the recovery fragile, and the financial sector still recovering from a shock which almost killed substantial parts of it. Since 2009, the economy has been recovering. And in the first part of 2010, the recovery looked to be gaining momentum. But more recently it appears to have slowed: output may have risen by only about 0.8% during the past 12 months. There is a risk that the economy could fall back into recession, though I do not believe this is the most likely outcome.

Many of the forces that bring about re-balancing also create short term (transitional) inflation pressures: the rise in the rate of VAT (which is one of the means of closing the fiscal deficit) and the fall in the exchange rate mean – all else equal – higher inflation pressures for a period. Add to that the impact of the huge rises in commodity prices over the past year (which has been in excess of 30%) and you would anticipate a serious inflation problem.

And the level of inflation is a real concern. Inflation on the CPI measure over the year to June is at 4.2% – more than double the 2% target. It is likely to move higher in the near term, largely as a result of higher prices for domestic energy, before coming down again. Inflation has been – and is likely to stay for a while longer – substantially above the rate of increase of wages and salaries. The squeeze on household real incomes has been exceptional.

Some have argued that the MPC, in allowing inflation to remain high and well above wage settlements, is somehow causing living standards to fall. I think this is plain wrong. The rise in VAT and in imported prices – particularly of commodities – requires that real disposable incomes be lower. If the things we import are more expensive our standard of living has to fall. If taxes need to go up disposable incomes – all else equal – will be lower. These things would not cease to be true if inflation were lower. How that fall in living standards is coming about for most households is that inflation has been running at 4% and more while most wage settlements are running at 2% or less. We on the MPC might have chosen to tighten monetary policy sharply and tried to engineer inflation that was near 2% today; that would probably have required widespread wage freezes only consistent with much higher unemployment. In this case the hit to real disposable incomes would have been no lower and quite likely would have been considerably greater.

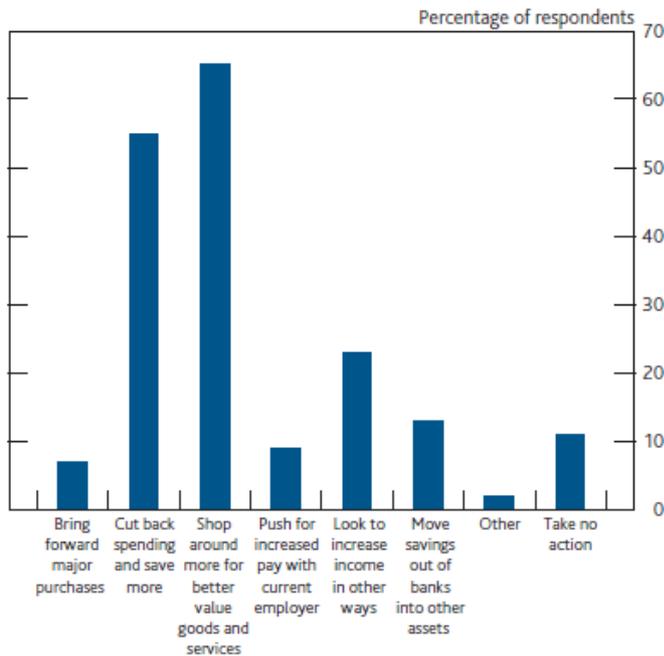
I am not for one moment denying that there is a problem with inflation. There is a risk that recent above target levels of inflation become more persistent if households expect inflation to stay high in a way that is

reflected in wage settlements and becomes self-fulfilling. But the reason that real living standards have fallen is not because inflation has been above 4% rather than at 2%. That fall in living standards reflects the aftermath of the financial crisis and the need to re-balance the economy – those are not what one could call nominal phenomena; they are real phenomena.

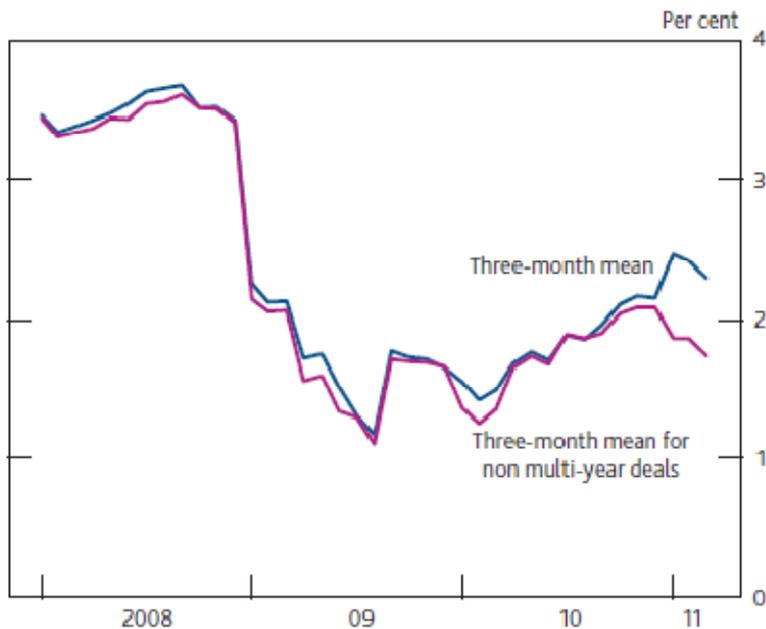
Nonetheless high inflation is dangerous because it can become persistent if expectations of future inflation rise. Private-sector shorter-term inflation expectations have indeed increased over the past year. But this is in line with the MPC's own revision of its shorter-term inflation forecast; I do not think that it should be read as evidence that the private sector has lost confidence in the inflation target.

A dislocation of longer-term inflation expectations would be more concerning, in particular if that led to persistently higher demands for wage increases. The evidence on private-sector longer-term inflation expectations is mixed: they have increased according to some measures, though appear stable according to others. Either way there is little evidence that any rise in inflation expectations has led to higher wage growth. In the latest Bank/NOP *Inflation Attitudes Survey* only around 10% of households said that they would respond to higher near-term inflation expectations by requesting higher wages (Figure 2). Instead, they appear to largely respond to higher inflation expectations by shopping around more for better value goods and services, and by cutting back spending. The current degree of slack in the labour market has reduced the ability of households to negotiate higher wages (Figure 3). This should contain domestically generated inflation.

**Figure 2: Households' response to higher inflation expectations<sup>3</sup>**



**Figure 3: Private sector pay settlements<sup>4</sup>**



Setting monetary policy in the economic environment I have been describing is not easy. The MPC's remit is clear on what the guiding principle is: the primary objective is to achieve the 2% inflation target. But the mandate is also based, and I quote: 'on the recognition that the actual inflation rate will on occasions depart

<sup>3</sup> Source: Bank of England *Inflation Report*, May 2011. Respondents to the February 2011 Bank of England England/GfK NOP Inflation Attitudes Survey were asked which, if any, of these actions they are taking, or planning to take, in light of their expectations of price changes over the next twelve months. Respondents could select up to three options.

<sup>4</sup> Source: Bank of England *Inflation Report*, May 2011.

from its targets as a result of shocks and disturbances. Attempts to keep inflation at the inflation target in these circumstances may cause undesirable volatility in output.<sup>5</sup>

In my view, this is exactly the situation in which we find ourselves at the moment. A series of shocks – commodity and energy price inflation, the depreciation of Sterling, and the increase in indirect taxes – have all contributed to the increase in inflation. In the absence of those things inflation in the UK would reflect the underlying, domestically generated inflation pressures. And I think that would mean a rate of inflation now pretty close to zero.

Still, inflation is likely to be significantly above target for all of 2011, and much of 2012. I think the most likely outcome is that growth might get back to about its historical average, or maybe marginally above it. Should that be how things evolve I believe it means that higher unemployment and some unused capacity will persist.

No one could describe those outcomes as benign. That reflects the severity of the downturn and the scale of the rebalancing needed; and this – in turn – reflects the seriousness of the banking crisis. Reinhart and Rogoff have shown that this is not unusual – after a financial crisis real economic activity is substantially depressed.<sup>6</sup> A decline in GDP of 10% relative to the pre crisis trend seems to be about par for the course. And much of the lost income and wealth does not come back. This prompts an obvious question:

### **How do we prevent a similar crisis from happening again?**

It seems to me clear that an important part of the answer is to make the financial system – and banks in particular – much more robust. I believe the single most effective way to do this is to have banks use *much* more equity and less debt to finance their activities so that their leverage is reduced. This would mean that banks could withstand greater falls in the value of their assets before they got near to a position where those who had provided debt were sufficiently concerned about not getting all their money back that they withdrew credit. Banks have reduced their leverage during the past two years (Figure 4). But it is a process that has some way to go.

Under the recently agreed Basel III rules banks will effectively need to have common equity capital that is at least 7% of their risk-weighted assets. As a percentage of total (un-weighted) assets that figure will be much lower – though ultimately it cannot fall below 3%. The most systemically important banks may need to use a bit more equity capital than these figures – maybe as much as 10% of risk-weighted assets. These figures are substantially higher than under Basel II – but they would still allow banks to have a degree of leverage (assets relative to equity) that is very high relative to non-banks and also much higher than used to be normal for banks. Even if a bank had equity capital relative to risk-weighted assets of 10% that might allow

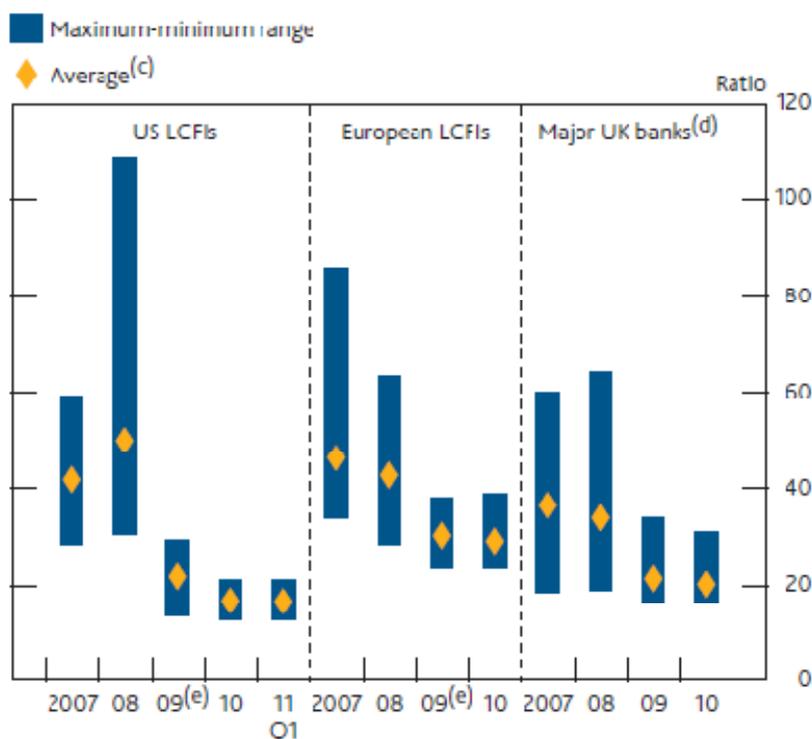
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<sup>5</sup> <http://www.bankofengland.co.uk/monetarypolicy/pdf/chancellorletter110323.pdf>

<sup>6</sup> Carmen Reinhart and Kenneth Rogoff (2009), *This time is different: eight centuries of financial folly*, Princeton University Press.

leverage to be 30, since a ratio of risk-weighted assets to total (un-weighted) assets as low as one-third is not uncommon.

**Figure 4: Major UK banks' and LCFIs' leverage ratios<sup>7</sup>**



So although the new rules might mean equity capital is substantially higher, it will not mean it is high in an absolute sense. Indeed I have argued that a ratio of common equity capital to assets that is twice as high as the Basel III rules is closer to a desirable place to ultimately get to.<sup>8</sup>

Yet there is a widespread view that having banks fund more of their assets through equity will be very costly<sup>9</sup> and that instead of issuing more equity, banks will reduce their risk-weighted assets, and lend less to households and firms. Figure 5 taken from the Bank's June *Financial Stability Report*, illustrates that during the last two years banks have increased their capital ratios by both increasing their equity and reducing their assets.

<sup>7</sup> Source: Bank of England *Financial Stability Report*, June 2011. The leverage ratio is 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. 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. Averages are computed by dividing total peer group assets by total peer group capital (c). Major UK banks exclude Northern Rock. Data for The Co-operative Bank are used for Co-operative Financial Services (d). Pro-forma data are used for RBS from 2007 to 2009. Revisions to US GAAP accounting rules on consolidation from 1 January 2010 are applied to end-2009 data giving a clearer measure of leverage (e).

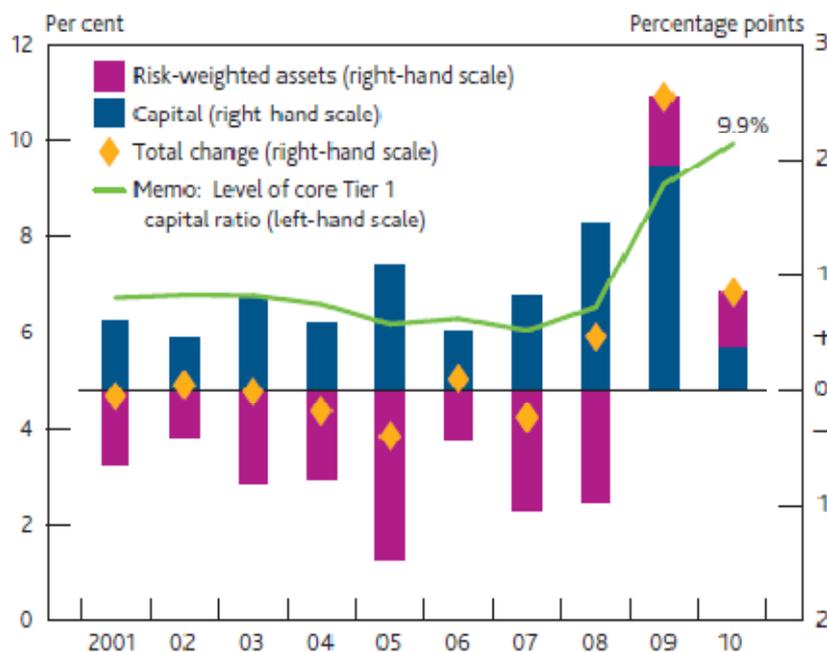
<sup>8</sup> See "Optimal Bank Capital", by David Miles, Gilberto Marcheggiano and Jing Yang, Bank of England MPC Unit Discussion Paper no 31, 2011. Available at <http://www.bankofengland.co.uk/publications/externalmpcpapers/extmpcpaper0031revised.pdf>.

<sup>9</sup> Those who make this point seldom draw a distinction between private costs and social costs. If higher bank capital reduces the value of public subsidies to a bank it may be that private costs are indeed significant while overall economic (or social) costs are not.

But I do not think we should jump to the conclusion that the main reason that bank lending in many countries has been weak is a consequence of banks realising the need to bolster equity. The low level of confidence in many non-financial firms and households and the rise in unemployment and in spare capacity within firms will have reduced the demand for credit even if there had been no change in the supply of credit. Of course there has also been a change in the supply of credit – partly because the cost of banks raising debt has gone up (certainly relative to interest rates set by central banks) and partly because banks in many countries may have increased the spread between their cost of funds and the rates charged on loans because they have re-appraised the risk of lending. All these things mean that lending will be lower, but they are not *caused* by banks needing to improve their ratio of equity funding to total assets.

Nonetheless there are many who believe that having banks raise their capital ratios will substantially reduce bank lending. I think that is not at all clear – particularly if the path to much higher use of equity is gradual. But what is clear is that it is of first-order macroeconomic importance whether having banks use more equity to fund their assets – and have lower leverage – means that their lending must be significantly lower. If that were inevitable – or even likely – it would have a bearing on investment and other spending in the economy and would therefore affect the setting of monetary policy. This is the question I now want to address.

**Figure 5: Contributions to the change in major UK banks' core Tier 1 capital ratios<sup>10</sup>**



<sup>10</sup> Source: Bank of England *Financial Stability Report*, June 2011.

## Why might lower bank leverage affect bank lending?

Those who believe that using more equity (that is having higher capital) will be very costly for banks, and that as a result they will reduce bank lending, often ask: “but where will the equity come from?” And this is a good question – in part because the sums involved can look large. To double the amount of common equity capital of banks in the US, UK, France and Germany from current levels might mean new equity of close to \$1 trillion. Even if banks were to be allowed several years to raise that much equity it might seem a huge challenge to induce reluctant investors to put this much new money into banks.

But there are fundamental reasons for believing that if banks are required to gradually raise the equity they use to find their assets there will not be great difficulties in finding suppliers of that equity.

First, the number looks very high when set against existing levels of common equity of banks; but that figure is not large relative to the total balance sheets of banks. Doubling common equity relative to total assets from, say, 5% to 10% means finding as much new equity as already exists<sup>11</sup>; but it would also mean replacing only a bit above 5% of debt financing with equity (Table 1).

**Table 1: Approximate ownership structure of major UK banks' liabilities<sup>12</sup>**

Liability instrument	Counterparty	% of total liabilities
Deposits	Banks	14%
	Private non-financial corporations	5%
	Households	16%
	Other financial corporations (OFCs)	18%
Bonds and medium-term notes in issue	largely banks, OFCs	8%
Other debt securities in issue	likely to be banks, OFCs	6%
Subordinated liabilities	largely OFCs	2%
Other liabilities (includes derivatives)	N/A	26%
Total equity	largely OFCs	5%
...of which Core Tier 1 equity		4%

Second, in requiring banks to finance more of their assets with equity and less with debt you are not requiring an increase in overall funding. Think of it as an equity-for-debt swap. You do not need to raise the saving rate for that to happen; it is a portfolio switch.

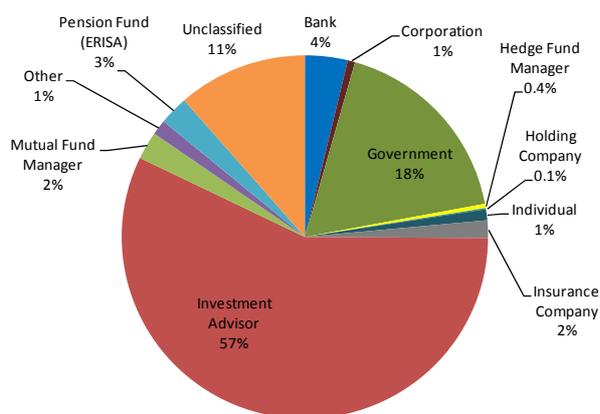
Nonetheless it might look like a big portfolio switch. But step back a minute. Who owns existing bank debt and equity? Ultimately the answer is (of course) households: you and me. Besides deposits, it is largely done

<sup>11</sup> Since banks often have risk weighted assets that are no more than 50% of total assets a rise in equity relative to total assets from 5% to 10% might represent a rise in equity to risk weighted assets from a bit above 10% to a bit above 20%.

<sup>12</sup> Source: Bank calculations. Breakdown of liabilities at the end of 2010 for Alliance and Leicester, Barclays, Bank of Ireland, Cooperative Financial Services, HSBC Holdings, Lloyds TSB, National Australia Bank, Nationwide, Northern Rock, RBS, and Santander. An exception are deposit holdings of private non-financial corporations, households, and other financial corporations, where the shares refer to all UK resident banks.

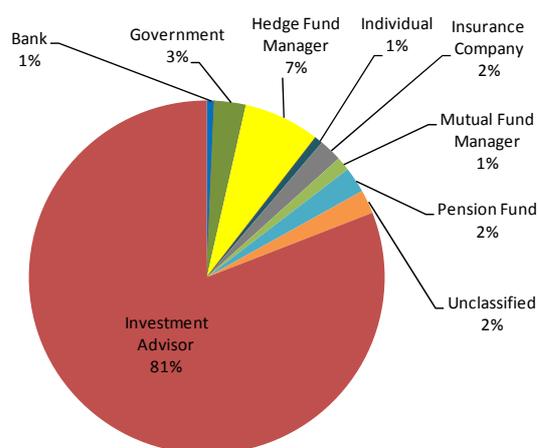
indirectly – through pension funds, insurance companies, asset managers, unit trusts, hedge funds and (more recently) governments. Figures 6, 7 and 8 show that the equity in banks is overwhelmingly owned by financial intermediaries – and held largely by asset managers or investment advisors acting on behalf of households. This is true in the UK, in the US, in Germany and indeed right across Europe. Direct ownership of bank equity by households is tiny. As we shall see shortly, the same is true of the non-deposit debt of banks.

**Figure 6: Major UK banks' shares – investor distribution by type**



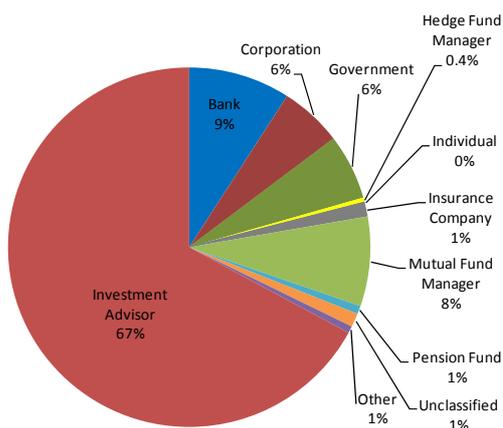
Source: Bloomberg, shareholders' register

**Figure 7: Major US banks' shares – investor distribution by type**



Source: Bloomberg, shareholders' register

**Figure 8: Major German banks' shares – investor distribution by type**



Source: Bloomberg, shareholders' register

The ultimate owners of equity in banks, households, also own bank debt – either directly in the form of retail deposits or indirectly as bank bonds held largely by many of the intermediaries we just listed (pension funds,

unit trusts, mutual funds, hedge funds etc). The great majority of both bank equity and bank bonds are held by financial intermediaries that are – under various guises – asset managers operating on behalf of households. Households provide a substantial part of bank debt in the form of bank deposits but the rest of bank debt – and for most banks the bigger part – comes overwhelmingly from other large financial intermediaries.

Let us assume just for the moment that all bank equity and debt (besides retail deposits) is owned by a single entity – an intermediary that we can think of as an asset manager that has some of the characteristics of a pension fund, unit trust, insurance company and hedge fund rolled into one. Now suppose that in order to reduce leverage, the banks issue additional equity and retire the corresponding amount of bonds. The asset manager finds that in order not to change the underlying character of its portfolio it will want to buy all the new bank equity issued, financed by running down its holding of bank bonds. If it does this its risk is little changed – it still owns all the bank's assets (because it owns all the bank equity), with an unchanged obligation to pay back the retail depositors.

To illustrate this, consider the following simple example. Suppose we start from a position where the typical bank has assets of 100 funded through 95 of debt (and debt-like instruments) and 5 of equity. Those who own the bank equity effectively have a portfolio that is equivalent to being long 100 of bank assets and short 95 of bank debt. Those who own the bank equity (overwhelmingly financial intermediaries who are asset managers) also have a lot of other financial assets – including other debt, either held long or short. And some of that debt may be issued by banks.

Let us assume that those who own the bank equity also hold at least 5 of bank debt, and that the bank needs to switch funding to equity = 10 and debt = 90. This looks a big change and it would double equity funding and halve leverage – but actually it can happen costlessly. Our financial intermediary /fund manager buys all the new equity and sells 5 of its bank debt. It did have a position in bank equity equivalent to a portfolio of A-95D (A = bank assets; D = bank debt). Now it has bank equity worth A-90D but it has also sold 5 of bank debt, so its **net** effective position in bank assets and in bank debt is unchanged (see Table 2). The whole thing is neutral<sup>13</sup>. What has happened is that the bank has issued less debt and more equity. The asset manager finds that in order not to change the underlying character of the investment portfolio they will want to buy all the new equity and finance it by running down some debt that has the same characteristics as bank debt. If they held bank debt (e.g. if they held bank bonds) then that is easily achieved by swapping bank equity for bank debt. If they don't hold bank debt they may either sell some debt which is a very close

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<sup>13</sup> The neutrality result is immediate if equity holders have unlimited liability. Even if there is limited liability – and so bond holders face some chance of not being repaid in full – the neutrality result can still hold. Suppose, for example, that investors are risk neutral; then as the amount of equity rises, and the chances of not being repaid in full falls, the interest rate paid on bonds falls so that the expected return on bonds is unchanged. The expected return to the equity holder would also be unchanged if they bought the new equity issued and reduced their holding of bank bonds. So if the rate of interest on bonds is re-set at the point leverage falls the neutrality result will still go through – though a sudden fall in leverage that was unexpected is not neutral because it would create gains to existing bond holders. Stiglitz ('A Re-examination of the Modigliani Miller Theorem', *American Economic Review* 59(5), 1969, pages 784-93) showed that the neutrality result can hold under a wider range of assumptions that include the possibility of bankruptcy and the existence of risk averse investors.

substitute for it, or else finance the purchase of the bank equity by borrowing, which has the same economic effect.

Of course the world is a much more complex place than this simple example allows – some asset managers only have long positions in bank equity and may not own bank bonds, while others only hold bonds. Only a minority of fund managers operate under so-called ‘balanced’ mandates with flexibility to allocate funds across both equity and debt instruments<sup>14</sup>. In response to banks’ deleveraging, these market players can sell some of their bank debt to buy more bank equity in order to keep the risk-return profile of their portfolio unchanged.

**Table 2: Equity-for-debt swap**

**Original positions**

<b>Bank</b>	
Assets	Funding
A	D E

**Portfolio of the equity investor**

Value of equity	A - D
Value of bonds	d
Total value	A - D + d

**Now swap 5 of debt for equity...**

<b>Bank</b>	
Assets	Funding
A	D - 5 E + 5

**Portfolio of the equity investor**

Value of equity	A - (D - 5)
Value of bonds	d - 5
Total value	A - (D - 5) + d - 5 = A - D + d

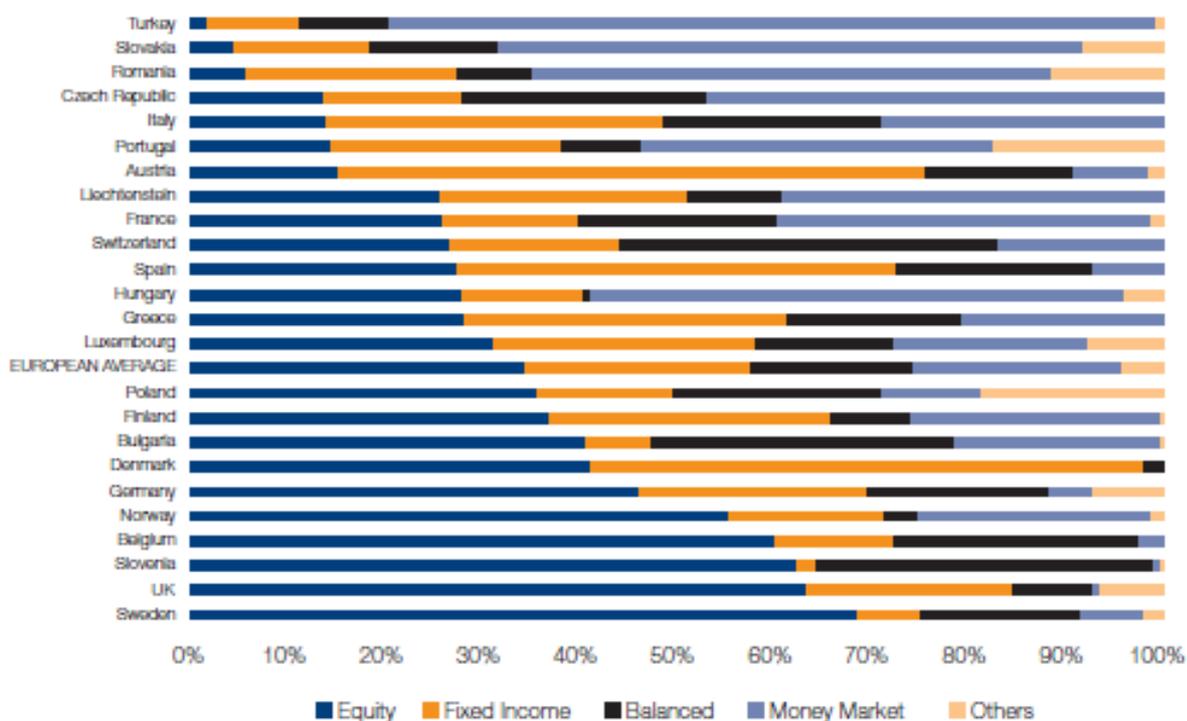
*Note: D is total bank debt; d is the equity investor’s holding of bank debt.*

Other fund managers, such as hedge funds, may be able to use leverage and therefore offset the impact of a reduction in the expected risk and return on bank shares by borrowing to buy more equity. And UK pension funds generally own a mix of debt and equity and have some flexibility to vary the shares of each. So hedge funds and pension funds might buy the additional bank equity and raise the necessary funds by selling some non-bank bonds, or even by borrowing. This debt could be bought by debt fund managers, whose overall portfolio size remains unchanged because the banks retire some debt they previously held. The risk characteristics of each fund in isolation will have changed a bit as a result of this; but for households as a whole – who ultimately own both funds – there is no change.

<sup>14</sup> The Investment Management Association (IMA) estimates that around 10% of asset management mandates in the UK fall into the balanced category. In addition, the trustees of defined benefit pension plans do not typically face regulatory restrictions with regards to their allocation of funds across asset classes.

Yet one cannot ignore the fact that the majority of asset managers operate under mandates that may allow little flexibility in terms of allocation between asset classes or use of leverage (Figure 9). But the risk characteristics of such funds who hold bank equity will change as a result of lower bank leverage. It seems reasonable to expect that investment advisors would highlight this to their customers and perhaps point out that to maintain the original risk-return trade-off they could shift some assets from fixed income to equity funds. Investment advisors regularly review their mandates with clients. If banks use relatively more equity and less debt to fund their assets this will change the portfolio characteristics of savers whose investment managers hold bank equity. A rebalancing of portfolios towards more equity and less fixed income securities would be needed to maintain the risk and return characteristics of the portfolio. This is because the less leveraged is a bank, the less volatile its equity.

**Figure 9: Asset mix in UCITS funds – European countries<sup>15</sup>**



Source: EFAMA

Many people will recognise here Modigliani Miller arguments in one of their guises. I have often argued that Modigliani-Miller's theorem on the irrelevance of the capital structure for a firm's cost of capital provides a useful *starting point* for thinking through the relation between capital requirements and the true economic cost of financing bank lending. In practice, the predictions of their theorem do not hold perfectly – but then one would not expect a simple, theoretical benchmark to explain reality one for one. That does not mean it is useless, any more than Newton's laws of gravitational force are useless in predicting the motion of falling objects because they do not explicitly allow for the impact of air resistance.

<sup>15</sup> Source: IMA (2010), *Asset management in the UK: The IMA Annual Survey 2009/10*. UCITS funds are undertakings for collective investments in transferable securities.

Using Newton's laws of motion and of universal gravitation – and making no allowance for frictions – one can readily compute how long a big apple that falls from the Empire State building will take to reach the ground and also what its speed will be when it hits West 34<sup>th</sup> Street. But if one actually tries this, one will find that Newton's prediction based on objects falling in a frictionless world overestimates this speed and underestimates the time it takes to fall. This is because it only holds in a friction-free world, not when air resistance is breaking the apple's fall. One response to this is to deny that Newton's law is of any practical use – because in the world there is air resistance. In other words we conclude that the theory tells us nothing and so anything can happen; maybe the apple will forever hover 1250 feet above street level. That does not seem to me a very sensible position to take. And for much the same reason I don't think it is sensible to say that Modigliani-Miller's theorem can be simply dismissed as irrelevant because it assumes a completely friction free world. The idea that if a theory's predictions are not 100% accurate they are entirely irrelevant is badly misguided. Anyone who used that as a guide to how to live will have a difficult, and quite probably short, life. They could never, for example, use a map of any sort – because a map is a model of the world that makes some simplifications to give you a useful (though not 100% accurate) idea of how the world is and how to navigate your way around it.

A more useful way of using the Modigliani Miller insights is to try to understand why the predictions are not perfect, just as allowing for the likely amount of air-resistance is the appropriate way to use Newton's insights on the motion of objects subject to gravity. One reason for why the mix of equity and debt might matter for the cost of banks' funding is that debt is tax-advantaged. Another is that investors may believe that banks issuing equity need the fresh funds to offset losses which the bank (or its regulator) thinks likely but the wider world as yet knows little about. And if there are subsidies to some banks because they are too big to fail the value of those subsidies will tend to decline as leverage falls.

One can debate the empirical relevance of these arguments: For example, how big is the tax advantage really, when investors in bank debt may have to pay higher tax on interest income than on returns on equity that come as dividends or capital gains? And how relevant are the coordination and signalling problems if an increase in capital ratios is mandated by the regulator?

### **Predictions in a world with frictions**

I think it is useful to take a particular theory of why some frictions that are specific to banks prevent Modigliani Miller (MM) holding and see whether they imply that a reduction in bank leverage will generate difficulties and significantly raise bank costs. I do this because it is worth asking whether a more general theory of bank capital structure than the Modigliani Miller framework – one that includes frictions – implies that if banks lower leverage the MM conclusion, which is that this will be costless, is still valid.

The description of banking that I want to consider was developed by Douglas Diamond and Raghuram Rajan.<sup>16</sup> The imperfections – or frictions – they introduce relative to the perfect MM world concern the difficulty of providers of funds to a bank in knowing what the bank management will do with the funds and their inability to step in and easily manage the bank assets if things seem to be going badly. They argued that financing a bank via demandable deposits helps here because it disciplines a bank’s management: if a bank’s management makes bad investment decisions, or divert excessive resources from the bank via enhanced bonuses and salaries, each individual depositor would find it best to withdraw their deposits. If the bank fails following this run by its depositors, the bank management would – probably – lose their jobs. This could deter them from “misbehaving” in the first place.

In contrast, if the bank was purely financed via equity, shareholders’ only defence against the bank management misbehaving is to fire them. But because shareholders are less able than the bankers to manage the bank’s assets, they are reluctant to fire them. This weakens their bargaining position, and allows the bankers to retain a larger share of the revenues that the bank’s lending activity generates.

As a result, Diamond and Rajan argued, households would be willing to provide funds to banks in the form of deposits, but they may be reluctant to provide them in the form of equity. Forcing the bank to issue more equity might lower the amount of external funds the bank can raise, and reduce bank lending.

Diamond and Rajan’s theory is coherent and it clearly reflects some important aspects of bank governance when there are information problems. Like any good theory it is also completely internally consistent. However, it is not clear how relevant their argument is for assessing the impact of the comparatively small change in the composition of banks’ liabilities that I am talking about. Would a bank’s management really be disciplined far less if it was financed 90% with debt and 10% with equity rather than 95% with debt and 5% with equity?

But even setting this aside, and ignoring that greater leverage makes financial crises more likely, let me briefly sketch an extension of their theory in which a debt/equity swap might still be completely neutral – as in the simple Modigliani Miller world. The key additional ingredient is the nature of institutional investors.

Let’s start from a situation in which banks are financed only by long-term debt (bonds) and demandable deposits. This is pretty close to where we are now, given that truly loss-absorbing equity on average accounts for less than 5% of most banks’ balance sheets. Assume that the banker, if he wanted to, could generate sufficiently high net returns from his assets to repay bond holders in full. But instead he misbehaves – maybe keeping too high a proportion of the gross revenues generated by the assets in remuneration so that what is left is less than what is due to debt holders. How would bond holders react?

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<sup>16</sup> Douglas Diamond and Raghuram Rajan (2000), ‘A Theory of Bank Capital’, *Journal of Finance* 55(6), pages 2431-2465.

Would they accept a debt restructuring, in which their claims are written down in order to avoid bankruptcy? This depends crucially on whether they can coordinate on a common response.

If bond holders are dispersed, just as retail depositors are, they cannot coordinate on a common response. In this case each would likely find it individually rational to insist on full repayment. The bank would go bankrupt, an administrator would take over, and the bank management would be fired. As in a pure deposit-financed bank, this would deter the bank management from misbehaving in the first place.

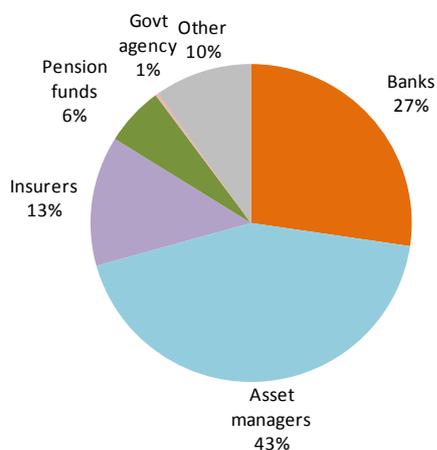
But if bank bonds are held by a small number of institutional investors, bond holders are unable to prevent an expectation that they will coordinate on re-negotiation once the bank management reveal that there may not be enough left over to pay all debtors: they have a collective interest in avoiding the bank's insolvency, so will accept that their claim is written down. This is exactly the same situation in which equity holders would find themselves: rather than firing the bank management, they accept that they only receive a fraction of the revenues that the bank generates.

All this suggests that when bank debt (besides retail deposits) is mainly held by a small number of institutional investors, bank bonds and equity have rather a similar ability to discipline bank management. If bank bonds and equity have similar characteristics the swapping of some bonds for equity would not have a big impact – it would not reduce the amount of funds that the bank can attract. Increasing the capital ratio does not have to reduce bank lending.

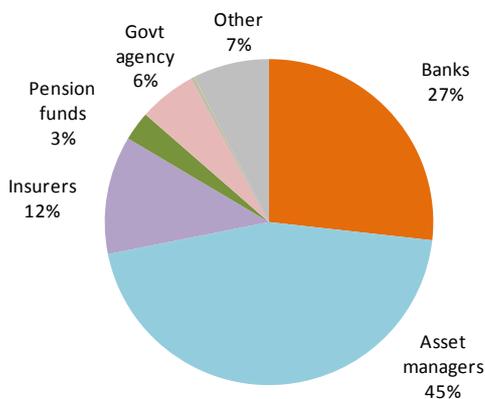
What is the proportion of bank equity and debt (besides retail deposits) that is held by institutional investors? Figures 6, 7 and 8 showed that individuals hold directly no more than 1% of bank shares of UK, US and Germany's largest banks. Figures 10, 11 and 12 suggest that a very similar picture applies to various types of bonds issued by UK and European banks.

The data in these charts shows who buys new issues of bank bonds, but it is very likely that this is representative of the ownership pattern of the existing stock of bonds. It is very clear from the charts that institutional investors buy a significant fraction of banks' primary issuance of debt securities. A substantial fraction is also bought by other banks. So it is likely that non-retail deposits – which for many banks is the greater part of their debt liabilities – is fairly tightly held by institutions. It does not play the role that widely-held, demandable bank debt does in the Diamond and Rajan world. I conclude that the MM framework remains a useful guide to the overall impact of a bank using relatively more equity, and relatively less bank bonds, to finance its assets.

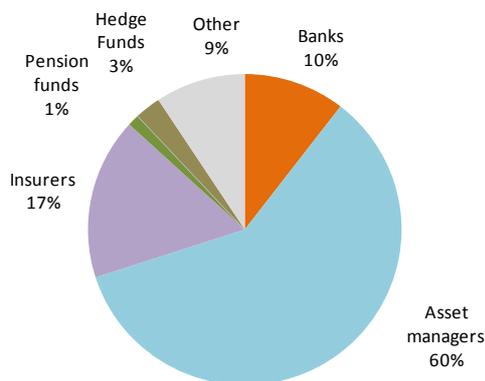
**Figure 10: Senior unsecured debt issuance by major UK banks in 2010 – investor distribution by type<sup>17</sup>**



**Figure 11: Covered bond issuance by major UK banks in 2010 – investor distribution by type<sup>18</sup>**



**Figure 12: Subordinated debt issuance by major UK banks in 2010 – investor distribution by type<sup>19</sup>**



To some, this may seem paradoxical. How can one argue that leverage does not matter, in the sense of not affecting much the cost of bank funding, and then say it is beneficial for it to be reduced? But there is no paradox. A gradual reduction in leverage does not impose substantial costs on banks. But the likelihood of banking crises would fall substantially. Banking crises impose substantial costs not only on banks, but also on the rest of the economy. (Think about small businesses who make frequent use of pre-arranged

<sup>17</sup> Sources: Bank calculations based on deal sheets from debt capital market desks and Euroweek. Based on sample of around £17bn deals in 2010.

<sup>18</sup> Source: Bank calculations based on deal sheets from debt capital market desks and Euroweek. Based on sample of around €25bn of new issuance.

<sup>19</sup> Sources: Bank calculations based on deal sheets from debt capital market desks and Euroweek. Based on deal volume of around £6bn in 2010.

overdrafts: if their bank fails, they may not be able to arrange a similar facility easily.) Reducing leverage does not simply shift these external costs of banking crises from the rest of the economy onto banks. Instead, lower leverage reduces the likelihood of crises in the first place. Their costs might be avoided altogether.

## Conclusions

Let me come back to the questions that I originally posed: do policies that make the banking system more robust threaten the recovery from today's crisis? And do they make the task of setting monetary policy more difficult?

I do not believe that either is the case. As I noted earlier, credit supply has fallen during the crisis. But tighter capital requirements are unlikely to have been the cause of this. Instead, the main reasons are the cost of banks raising debt has gone up relative to safe interest rates set by central banks; and that banks have re-appraised the risk of their lending. Monetary policy can attempt to counteract this temporarily by keeping safe interest rates low. But ultimately the reasons for reduced bank credit supply work like a tax on credit intermediation: if those forces persist they raise the *real* cost of bank credit intermediation. In the long run, monetary policy cannot affect real variables, and therefore cannot offset an increase in the long run real cost of bank lending.

Because the main reasons for tighter bank credit supply lie elsewhere, I do not believe that higher capital requirements that are phased in gradually must weaken a recovery or make the task of setting monetary policy more difficult. Admittedly, if a substantial switch from debt to equity funding of banks were to have to happen suddenly, banks might constrain lending to increase their capital ratios. Frictions inhibit an equity-for-debt swap in the short term: it takes time to change mandates of investment managers; there are recognition lags as investors may take time to see that bank equity gets less volatile if there is more of it. But gradually investment advisors and trustees will want to react to that by re-balancing portfolios and mandates may get changed. So I think those frictions, which may be significant in the short term, are very much less significant over time. This means that if the switch in bank funding patterns can happen gradually it is likely to create few difficulties and have low cost.

This is good news. It means the benefits of a more stable banking sector come at low cost. This is precisely why having banks hold a lot more capital plays a crucial role in making the financial system safer.