Andrew G Haldane: Banking on the state

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1. Introduction

Historically, the link between the state and the banking system has been umbilical. Starting with the first Italian banking houses in the 13th century, banks were financiers of the sovereign. Sovereign need was often greatest following war. The Bank of England was established at the end of the 17th century for just this purpose, financing the war debts of William III.

From the earliest times, the relationship between banks and the state was often rocky. Sovereign default on loans was an everyday hazard for the banks, especially among states vanquished in war. Indeed, through the ages sovereign default has been the single biggest cause of banking collapse.[1] It led to the downfall of many of the founding Italian banks, including the Medici of Florence.

As awareness of sovereign risk grew, banks began to charge higher loan rates to the sovereign than to commercial entities. In the 15th century, Charles VIII of France paid up to 100% on war loans to Italian banks, which were at the same time charging Italian merchants 5-10%.[2] The Bank of England's first loan to government carried an interest rate of 8% – double the rate at which the Bank discounted trade bills.

For the past two centuries, the tables have progressively turned. The state has instead become the last-resort financier of the banks. As with the state, banks' needs have typically been greatest at times of financial crisis. And like the state, last-resort financing has not always been repaid in full and on time. The Great Depression marked a regime-shift in state support to the banking system. The credit crisis of the past two years may well mark another.

Table 1 provides a snap-shot of the scale of intervention to support the banks in the UK, US and the euro-area during the current crisis. This totals over $14 trillion or almost a quarter of global GDP. It dwarfs any previous state support of the banking system. These interventions have been as imaginative as they have large, including liquidity and capital injections, debt guarantees, deposit insurance and asset purchase.

The costs of this intervention are already being felt. As in the Middle Ages, perceived risks from lending to the state are larger than to some corporations. The price of default insurance is higher for some G7 governments than for McDonalds or the Campbell Soup Company. Yet there is one key difference between the situation today and that in the Middle Ages. Then, the biggest risk to the banks was from the sovereign. Today, perhaps the biggest risk to the sovereign comes from the banks. Causality has reversed.

State support is one side of the "social contract" between banks and the state.[3] State regulation of banks is the other. Table 1 suggests that the terms of this social contract have

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1 Reinhart and Rogoff (2009) provide an outstanding history of financial crises over the past 800 years.

2 Homer and Sylla (2005).

3 Tucker (2009).

recently worsened. That should come as no surprise. At least over the past century, there is evidence of a ratchet in the scale and scope of state support of the banking system (Section 2). Whenever banking crises strike, the safety net has bulged. Like over-stretched elastic, it has remained distended.

What explains this ratchet? All contracts are incomplete.[4] Contractual relationships, like personal ones, often break down due to commitment problems. Social contracts between the state and the banks are no exception. This generates a time-consistency problem for the authorities when dealing with crisis – a tendency to talk tough but act weak. This explains historical hysteresis in the safety net (Section 3).

So what can be done? There are many reform proposals on the table.[5] Two sets of initiative are discussed here: changes to the regulation of banks' risk-taking; and changes to the terms of the social safety net to improve its time-consistency. It is too early to know whether these measures will be sufficient. But recent events suggest some mix of these measures is surely necessary.

2. Evolution in the banking safety net

The three longest standing state insurance devices for the banking system are *liquidity* insurance, *deposit* insurance and *capital* insurance. These offer protection to different parts of banks' capital structure, respectively wholesale deposits, retail deposits and equity. So how have risks to banks' balance sheets – in effect, the "insurable interests" of the state – evolved over time? And how, in turn, has this evolution shaped the design of the banking safety net?

The UK provides a useful historical case study. Chart 1 plots UK banks' balance sheet against GDP since 1880. The ratio is flat for almost a century, at around 50%. Over this period, banks' assets grew roughly in line with money spending. But from the early 1970s, this pattern changed dramatically. By the start of this century, bank balance sheets were more than five times annual UK GDP. In the space of a generation, the insurable interests of the state had risen tenfold.

By itself, this expansion of balance sheets need not imply that the state was bearing greater implicit risk. For example, banks could have self-insured by holding larger buffers of capital and liquidity. In practice, the opposite happened (Charts 2 and 3). Capital and liquidity ratios have fallen secularly in the UK and US for over a century.

Since the start of the 20th century, capital ratios have fallen by a factor of around five in the US and UK. Liquidity ratios have fallen by roughly the same amount in half that time. Taken together, these balance sheet trends indicate a pronounced rise in banking system risk and hence in potential demand for state insurance. They have also affected the returns required by bank shareholders.

As banks moved up the risk spectrum, the return required by shareholders has predictably increased. Between 1920 and 1970, the return on UK banks' equity averaged below 10% per annum, with low volatility of around 2% per year (Chart 4). This was roughly in line with risks and returns in the non-financial economy.

The 1970s signalled a sea-change. Since then returns on UK banks' equity have averaged over 20%. Immediately prior to the crisis, returns were close to 30%. The natural bedfellow to higher return is higher risk. And so it was, with the volatility of UK banks' returns having trebled over the past forty years.

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[4] Indeed, contract incompleteness is one of the reasons banks exist in the first place (Rajan (1998)).

[5] See, for example, King (2009).

This regime shift upwards in the risk and return profile of UK banks can be explained by the fall in their capital ratios. Higher leverage boosts required returns on equity because it simultaneously makes the banking system's balance sheet more fragile. There is unlikely to be a better case study of these dynamics at play than events over the past decade.

So how has the state's safety net evolved in response? The element of the safety net with the longest historical pedigree is *liquidity insurance*, typically provided by the central bank in the form of last resort lending. The principles behind last resort lending were first articulated by Henry Thornton at the beginning of the 19th century and were subsequently elaborated by Walter Bagehot.[6]

Last resort lending in practice was often rather less elegant than the theory. Writing at the time of the 1825 banking crisis, Jeremiah Harman, Director of the Bank, described it thus:

> "We lent [money] by every possible means and in modes we have never adopted before; we took in stock on security, we purchased Exchequer bills, we made advances on Exchequer bills, we not only discounted outright, but we made advances on the deposit of bills of exchange to an immense amount, in short, by every possible means consistent with the safety of the Bank…Seeing the dreadful state in which the public were, we rendered every assistance in our power."[7]

Chart 5 plots the Bank of England's balance sheet in relation to GDP since 1830. Stripping out the effects of the two World Wars, this ratio has declined fairly steadily, from around 15% in 1830 to around 5% at the start of this century. Financial panics over this period did little to interrupt the downward trend.

Events of the past two years have dramatically altered that picture. In relation to GDP, base money in the UK has risen by a factor of four – easily the highest financial crisis multiplier ever.[8] It has reached a peak last witnessed almost two centuries ago. Past liquidity crises are foothills by comparison with recent Himalayan heights.

Measures of central bank balance sheet expansion under-estimate the scale of liquidity support provided during this crisis. As in Harman's time, there has been a widening of the collateral taken by most central banks in their operations.[9] The taking of imaginative forms of collateral has a history which predates central banking: in the 12th century, King Baldwin II of Jerusalem secured a loan using his beard as collateral. Nonetheless, recent efforts are probably unprecedented in scope.

Collateral swaps, typically not involving beards but often requiring haircuts, have also played a significant role during this crisis. They too do not expand base money, but do liquefy banks' balance sheets. And guarantees of wholesale liabilities have similarly served as an important liquidity insurance device for a number of countries. Together, these two instruments have totalled between 10% and 40% of GDP across the UK, US and euro-area.

Plainly, there has been a dramatic expansion in both the scale and scope of state liquidity insurance to the banking system. This pattern has been repeated in the majority of recent systemic banking crises. In a study of 42 systemic banking crises between 1970 and 2007, Laeven and Valencia find peak liquidity provision of almost 30% of total deposits. Drastic times clearly call for drastic measures. Harman's description of last resort lending in 1825

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6 Thorton (1802), Bagehot (1873).

7 Quoted in Bagehot (1873).

8 The sample ends before quantitative easing began, so base money growth is not affected by recent monetary policy actions in the UK.

9 Committee on the Global Financial System (2008).

would not look out of place today. Except, crucially, the decimal point would have changed place.

Deposit insurance and *capital insurance* have a shorter history. Deposit insurance was first introduced in the US in 1934, to protect retail depositors scorched by the experience of the Great Depression. It failed to catch on internationally. By the early 1960s, the US was still the only developed country with an explicit deposit insurance scheme. Since then, there has been a steady rise in the number of adopting countries (Chart 6). By 2009, almost 100 countries globally had such a regime.

Typically, the introduction and extension of deposit insurance regimes has been a response to banking crisis. This time's crisis has been no exception. Australia and New Zealand have both introduced deposit guarantee schemes. And more than forty countries have increased the coverage limits of their existing schemes, including in the UK, US and Germany. In a few countries, deposit insurance limits have temporarily been removed – for example, in Germany and Ireland. In many others, they have been removed implicitly.

This, too, is a familiar pattern at crisis time. Laeven and Valencia find that coverage limits for deposit insurance schemes on average increase fourfold in relation to GDP after systemic crises.[10] As with liquidity insurance, there has been a secular expansion in the scope and scale of deposit insurance.

Finally, explicit *capital insurance* of the banking system appears to have been a more recent phenomenon. In the US, the Reconstruction Finance Corporation was established in 1932 at the height of the Great Depression; it played a key role in recapitalising US banks through injections of preferred stock. More recently, recapitalisation of the banks has accompanied the banking crises in Scandinavia, Japan, Asia and Latin America.

Historically, capital injections into the UK banking system have tended to be small and bespoke – for example, at the time of the secondary banking crisis in the 1970s and the small banks crisis in the early 1990s (Table 2).[11] In terms of scale, capital injections during this crisis knock these interventions into a cocked hat. Once again, the decimal place has changed place. This pattern is replicated in studies of recent systemic banking crises. Since the 1970s, capital injections to the banking system have averaged around 8% of GDP at crisis time.[12]

Taken together, this evidence paints a consistent picture: a progressive rise in banking risk and an accompanying widening and deepening of the state safety net. There is a ratchet. This ratchet is evidence of a policy time-consistency problem.

3. Time-consistency and the banking safety net

What explains this time-inconsistency? A simple framework is developed to explain the existence of, and ratchet in, the safety net. It focuses on the incentive structures facing owners of banks and the risk strategies they pursue. The run-up to the present crisis provides several examples of those incentives and strategies at work.

Take the payoff profile facing a bank shareholder. Assume that the sensitivity of the bank's assets to aggregate risk – in the language of finance, its beta – equals 0.1. So for every 10% movement in the market as a whole, the bank's assets move by 1%. Assume too that the beta of the bank's deposits is zero and that the bank has an equity capital ratio of 10%. While arbitrary, these numbers are broadly plausible. Conveniently, under those assumptions the

[10] Laeven and Valencia (2009).

[11] Logan (2000).

[12] Laeven and Valencia (op.cit.).

beta of the bank's equity equals one. Figure 1 shows the payoff profile facing owners of the bank.

The return on a bank's equity lies on a 45 degree line when market returns are positive. Gains to shareholders are potentially unlimited. But the same is not true in bad states of the world. The reason is limited liability. That constrains the losses of shareholders to around zero. Losses beyond that point are borne by other parts of banks' capital structure – wholesale and retail depositors. Therein lies the problem.

If protection of depositors is felt to be a public good, these losses instead risk being borne by the state, either in the form of equity injections from the government (capital insurance), payouts to retail depositors (deposit insurance) or liquidity support to wholesale funders (liquidity insurance). The gains risk being privatised and the losses socialised. Evidence suggests this is a repeated historical pattern.

Socialised losses are doubly bad for society. Taxes may not only be higher on average. They may also need to rise when they are likely to be most painful to taxpayers, namely in the aftermath of crisis. So taxes profiles will be spiky rather than smooth and will spike when the chips are down. This is the opposite to what tax theory would tells us was optimal.[13]

So far, so bad. But it is about to get worse, for this tells only half the story. This is a repeated game. State support stokes future risk-taking incentives, as owners of banks adapt their strategies to maximise expected profits. So it was in the run-up to the present crisis. In particular, five such strategies were clearly in evidence:

- Higher leverage: The simplest way of exploiting the asymmetry of payoffs arising from limited liability is to increase leverage. For example, if the capital ratio of the hypothetical bank were to halve from 10% to 5%, the beta of the bank's equity would double (Figure 2). In that event, the imbalance between privatised gains (above the zero axis) and socialised losses (below the zero axis) would increase. Private investors would harvest more of the upside and export more of the downside.

  There is clear evidence of this strategy being pursued over long sweeps of history (Chart 2). Chart 7 looks at the behaviour of UK banks over the past decade; it plots their leverage against the riskiness of their assets. UK banks migrated North-West over the past ten years, with balance sheet expansion financed by higher leverage. Because UK and European banks were not subject to any regulatory restriction on simple leverage, there was no effective brake on this leverage-fuelled expansion.

  Higher leverage fully accounts for the rise in UK banks' returns on equity up until 2007. It also fully accounts for the subsequent collapse in these returns. The high-leverage strategy pursued by UK and European banks rather effectively privatised gains and socialised losses.

- Higher trading assets: An alternative means of replicating the effects of higher leverage is to increase the proportion of assets held in banks' trading books. Trading assets are marked to market prices, thereby increasing their sensitivity to aggregate market fluctuations (beta). To illustrate, assume that a bank holds 90% of its assets in the banking book (with a beta of zero) and the remainder in the trading book (with a beta of one). That gives an asset beta of 0.1 and an equity beta of unity (Figure 1). But if the size of the trading book is doubled to 20% of assets, this doubles the equity beta of the bank (Figure 2).

  Chart 8 plots a cross-section of global banks' trading assets as a fraction of their total assets against their leverage. It suggests that efforts to expand balance sheets through higher leverage were focussed on trading assets. In the first part of this

[13] Barro (1979).

decade, rising asset prices delivered mark-to-market gains on banks' expanding trading assets. This boosted their profitability and returns on equity. As long as asset prices rose, this created an Alice in Wonderland world in which everybody had won and all had prizes.

But when asset prices fell, reality returned. The same institutions suffered enormous mark-to-market trading book looses. Across global banks, trading book losses since the start of the crisis total over $900bn. In a number of cases, these losses necessitated state support. Trading book expansion also allowed banks to import the upside and export some of the downside.

- Business line diversification: A third strategy pursued by many financial institutions in the run-up to crisis was diversification of their business lines. For banks individually, this made sense. It helped reduce the idiosyncratic risk from individual business lines. Pre-crisis, this strategy seemed the epitomy of sound banking.

  In fact, it epitomised Keynes' description of a sound banker: "one who, when he is ruined, is ruined in a conventional and orthodox way with his fellows, so that no-one can really blame him".[14] Because, for risk across the system as a whole, this strategy has systemically dangerous consequences. By increasing the similarity of banks' asset portfolios, it increases the system's sensitivity to aggregate fluctuations. Although diversification may purge idiosyncratic risk, it simultaneously reduces diversity and thereby increases systemic risk.[15] It, too, increases the risk of adversity being socialised and prosperity privatised.

- High default assets: A fourth strategy for exploiting the asymmetry of equity payoffs is to originate assets which themselves have asymmetric returns. High risk loans are one example. These assets yield a high fixed payoff in good states of the world, but in bad states default generating large losses. Because losses are bunched in the tail, the result is that more of the gain is privatised and more of the loss socialised (Figure 3).

  This was the strategy pursued by US banks in the run-up to crisis. Unlike banks in Europe, US banks were effectively constrained from expanding their balance sheet by a regulatory leverage ratio. So instead they did the next worst thing: they sought higher return on equity by increasing the riskiness of their asset pool. This explains their venture into sub-prime and leveraged lending and various kinds of securitised exotica.

  Chart 9 looks at the leverage and risk positions of European versus US banks. European banks lie in the North West, as they exploited the absence of a leverage constraint to expand their balance sheets in search of higher return on equity. US banks, by contrast, located themselves in the South-East with lower leverage but higher risk per unit of assets. For US banks, this was a best response strategy for boosting shareholder payoffs. When risk on these high-default assets materialised, however, the result was the same as for European banks – deep losses, often cushioned by the state.

- Out-of-the-money options: The payoffs to high-risk lending can be replicated using an alternative strategy of writing deep out-of-the-money options. This can be achieved, for example, by selling protection in the CDS market. The writer of that protection receives an insurance premium and thus a steady source of income in

[14] Keynes (1931).

[15] Haldane (2009), Beale et al (2009).

good states of the world. Because of that, this strategy appears to generate "alpha" – excess returns – during the good times.

In fact, this strategy is a wolf wrapped in sheep's clothing; it is beta dressed up as alpha. In the event of a bad state of the world – default by the reference entity in a CDS context – the writers of the insurance suffer a significantly negative payoff, eliminating the apparent alpha earned in good states (Figure 3). This was, in effect, the AIG strategy. AIG is believed to have written around $1.0 trillion of CDS protection. This strategy delivered large apparent "alpha" returns during the disco years. But when the music ceased and true beta was revealed, AIG required state support of around $180bn.

These five strategies are the latest incarnation of efforts by the banking system to boost shareholder returns and, whether by accident or design, game the state. For the authorities, it poses a dilemma. Ex-ante, they may well say "never again". But the ex-post costs of crisis mean such a statement lacks credibility. Knowing this, the rational response by market participants is to double their bets. This adds to the cost of future crises. And the larger these costs, the lower the credibility of "never again" announcements. This is a doom loop.

The "St Petersburg paradox" explains how a gambling strategy which starts small but then doubles-up in the event of a loss can yield positive (indeed, potentially infinite) expected returns. Provided, that is, the gambler has the resources to double-up in the face of a losing streak. The St Petersburg lottery has many similarities with the game played between the state and the banks over the past century or so. The banks have repeatedly doubled-up. And the state has underwritten any losing streak. Clearer practical examples of a policy time-consistency problem are unlikely to exist.

4. Resolving the time-inconsistency problem

In addressing this time-consistency problem, two broad approaches are possible: redesign of the financial system to reduce the scale of insurable risks; and redesign of the social safety net to make it less susceptible to gaming.

(a) Redesigning the financial system

What options best tackle excessive risk-taking incentives? A number suggest themselves, some modest, others more radical.

- Introducing leverage limits: One simple means of altering the rules of the asymmetric game between banks and the state is to place heavier restrictions on leverage. European banks were not subject to a regulatory leverage ratio in the run-up to crisis. They exploited that loophole. Closing it would bring about a clockwise rotation in banks' payoff schedule, lowering the beta of banks' equity returns and reducing risk-taking incentives.

  This is an easy win. Simple leverage ratios already operate in countries such as the US and Canada. They appear to have helped slow debt-fuelled balance sheet inflation. The Basel Committee is now seeking to introduce leverage ratios internationally. To be effective, it is important that leverage rules bite. They need to be robust to the seductive, but ultimately siren, voices claiming this time is different. That suggests they should operate as a regulatory rule (Pillar I), rather than being left to supervisory discretion (Pillar II).

  It is important, too, that leverage limits are set at the right level. Such limits need to be fundamentally re-evaluated. We have sleepwalked into a world in which leverage of 20 or 30 times capital is the rule rather than the exception. Now is a good time to wake up. Evidence from the not-too-distant past suggests there may be less to fear

from materially higher capital ratios – say, a multiple of current ratios – than some would suggest (Chart 2).

- Recalibrating risk weights: With hindsight, the capital assigned to certain categories of high-risk and off balance sheet transactions by Basel rules was far too low. Those mis-calibrations were then arbitraged by the banks in ways which included inflated trading books and an over-expansion into high-risk loans and securitised assets.

  The Basel Committee has already set about trying to correct some of the more obvious of these defects. For example, materially higher risk weights are set to be introduced for trading book assets from the end of 2010. This will include, importantly, securitised and re-securitised products, whose payoffs profiles too closely resembled deep out-of-the-money options (Figure 3). New risk weights should better reflect the tail risk these products embody.

  These reforms will close a regulatory loophole and thereby lower the beta of, and hence systematic risk in, the banking system. They leave open some rather more fundamental questions, which the Basel Committee are also considering. These include whether the distinction between banking and trading books, and the re-securitisation of assets, are necessary in the first place. If a robust financial and regulatory system is one which is parsimonious and transparent, the answer might be that they are not. It may be time to take Occam's razor to regulatory rulebooks.

- Rethinking capital structure: Asymmetry of payoffs risks excessive risk-taking. The source of this asymmetry is limited liability. It is revealing that limited liability was first introduced into banking in the UK in the mid-19th century. That was roughly the time state support for banks took shape. This is unlikely to have been serendipity. So could the distortions from limited liability be tackled at source?

  In the early days of banking, liability was not just unlimited; it was often as much personal as financial. In 1360, a Barcelona banker was executed in front of his failed bank, presumably as a way of discouraging generations of future bankers from excessive risk-taking.[16] It has not been conspicuously successful. From the Middle Ages, debtor prisons replaced the gallows. They were a common feature of many developed countries, including the US and UK, right up until the 19th century.

  The switch to limited liability at that time was a conscious attempt to encourage risk capital into the banking system to help finance growth. In essence, this meant trading off financial risk against future productivity. At first, equity in banks often carried "double liability", with shareholders liable for losses on the purchase price of their shares plus their par value at issuance. Among state banks in the US during the 19th and early 20th centuries, double liability is believed to have helped constrain risk-taking.[17]

  This practice was ended at the time of the Great Depression in the US. Given the likely need to rebuild bank equity in the future, now may not be the time to return to unlimited liability. Fortunately, there are two alternative approaches to adapting capital structure which alter the balance of risk-taking incentives, without jeopardising the flow of risk capital. Both involve operating not on equity, but on debt. And both involve making debt, like equity, a more loss-absorbing instrument in stress events.

  First, contingent capital is a means of automatically converting debt instruments into equity in the event of a capital top-up being needed. The capital structure of banks

[16] Caprio and Honohan (2008).

[17] Grossman (2001).

thereby becomes more malleable. There has been recent interest in contingent capital instruments as a means of providing banks with an extra degree of freedom in stress situations.[18] The benefits in principle seem clear. The difficulties in practice include whether there is likely to be sufficient investor demand for such hybrid instruments.

Second, wholesale debt instruments at present rank equally with retail deposits in the UK in the event of a wind-up. In the US, depositor preference has operated nationally since 1993, with retail deposits ranking ahead of wholesale debt. There are benefits to depositor preference both ex-ante (by heightening debtor incentives to monitor risk) and ex-post (by facilitating resolution). There are also some potential downsides, including causing unsecured creditors to run sooner. It may be a good time to reweigh these arguments in the UK.

- Reconsidering the industrial organisation of banking: Over the past few decades, the global banking system has evolved into a particular organisational form, with a small number of large banks, a high degree of concentration and relatively low rates of entry and exit. Events of the past two years have accelerated these trends. In 1998, the five largest global banks had around 8% of global banking assets. By 2008, this fraction had doubled to around 16% (Chart 10).

  These structural trends worsen the time-consistency problem for the authorities, increasing the pressure for state support to banks "too important to fail". This has heightened recent interest in rethinking the industrial organisation of finance.[19] There are a number of potential forms such a restructuring could take.[20] In weighing these options, there may be lessons from an, on the face of it, unlikely corner of finance: hedge funds.

  Hedge funds started this crisis in the doghouse. Yet they are the dog that has not barked. Their industrial structure may explain why. Unlike banking, the hedge fund sector does not comprise a small number of large players, but rather a large number of relatively small players. The largest hedge funds typically have assets under management of less than $40bn, the largest banks assets in excess of $3 trillion.

  Unlike banking, concentration in the hedge fund sector is low and has been falling. The top 5 hedge funds comprise around 8% of total assets, down from 30% a decade ago (Chart 10). Unlike banking, the business models of hedge funds are typically specialised rather than diversified. And unlike banking, entry and exit rates from the hedge fund industry are both high. The annual average attrition rate for hedge funds is around 5%. At present, it is around double that. Among US banks, the average attrition rate over the past few decades has been less than 0.1%; it has not come close to hitting 5% at any point since the Great Depression.

  It may be coincidence that the structure of the hedge fund sector emerged in the absence of state regulation and state support. It may be coincidence that the majority of hedge funds operate as partnerships with unlimited liability. It may be coincidence that, despite their moniker of "highly-leveraged institutions", most hedge funds today operate with leverage less than a tenth that of the largest global banks. Or perhaps it might be that the structure of this sector delivered greater systemic robustness than could be achieved through prudential regulation. If so, that is an important lesson for other parts of the financial system.

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[18] King (2009), Dudley (2009).

[19] King (2009).

[20] For example, Kay (2009), G30 (2009).

(b) Redesigning the safety net

- A framework for the banking safety net: Even with systemic risk reduced, the state is unlikely to be able credibly to stand aside when future tail risks eventuate, as they are sure to do. Some bulwark is needed. As in other public policy arena, a pre-defined and transparent regime can help reinforce the credibility of ex-post actions, serving as a pre-commitment device.

  At present, only some of the ingredients of such an ex-ante framework exist. Internationally, deposit insurance frameworks tend to be fairly well-defined; liquidity insurance frameworks somewhat less so. Both are much better defined than frameworks for capital insurance. A well-articulated framework for the banking safety net would not only provide greater clarity on each of these pieces. It would also set out interactions and interdependencies between them – when and how the different insurance strands come together to avert crisis. At present, no such ex-ante map exists. Having one in future would not guarantee, but could only increase, the chances of it being adhered to.

- Time-consistent liquidity insurance: Almost all central banks have flexed their liquidity frameworks during the course of this crisis. And rightly so. In many cases, this has meant a combination of longer-maturity lending to a broader range of financial institutions against a wider set of collateral. Pre-crisis liquidity insurance frameworks were shown during crisis to lack time-consistency. How can we best guard against a recurrence?

  Two elements are key. First, a greater degree of self-insurance by banks to lower the probability of central bank resources needing to be drawn. In practice, this means that liquidity regulation needs to be tightened, reversing the secular fall in liquidity ratios (Chart 3). In the language of insurance, the excess on the central bank policy needs to be raised materially. The FSA's proposed new liquidity regulation provides a good starting point.[21]

  Second, central bank liquidity insurance frameworks need explicitly to recognise the possibility of drastic times requiring drastic measures. The key is to prevent such drastic action becoming disorderly on the one hand, and permanent on the other.

  The first can be achieved by having a pre-defined framework which recognises the need for abnormal liquidity provision, whether in size, collateral quality or term. The second can be achieved by setting prices (fees and collateral haircuts) for liquidity provision which discourage abnormalities from becoming regularities. The Bank of England's new sterling monetary framework, announced last October, seeks to apply those principles in practice.[22]

- Time-consistent deposit insurance: Deposit insurance schemes have been stretched in many countries, to the point of offering blanket coverage of retail deposits. Those actions are already damping the risk senses of depositors, who have rationally reacted by seeking out the highest-yielding accounts. This has contributed to a competitive frenzy in the retail deposit market. In the UK, retail deposit rates have risen over the past year from 100 basis points below base rate to 100 basis points above.

  In general insurance markets, distorted risk choices are guarded against by sharing the risk between insurer and insuree, ex-ante (through risk-based premia) or ex-post (through co-insurance devices). Deposit insurance regimes in some, but not all,

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[21] FSA (2009).

[22] Bank of England (2008).

countries have such features. In the UK, deposit insurance premia are not risk-based. Private risk incentives would be better aligned with the public good if the UK's deposit insurance regime had such a feature.

- Time-consistent capital insurance: In historical terms, capital insurance to the banking system is the newest of the state support mechanisms for banks. Partly for that reason, its framework is least well advanced. Indeed, give or take, there is no framework at present.

Whether one is needed will depend importantly on the levels of private capital held in future by the banking system – the degree of self-insurance. That debate has some distance still to travel. But there are complementary measures which could serve a similar purpose. For example, some academics have proposed private sector capital insurance schemes, funded ex-ante by levies on banks.[23] So too have some policymakers.[24] These schemes are similar in many respects with existing deposit insurance regimes. Like them, such schemes would ideally set risk-based premia and be pre-funded to ensure they were time-consistent.

One potential benefit of private sector contingent capital proposals are that they allow a mutualisation of risk. This lowers the aggregate pool of capital that might be needed by the banking system. If this pool of capital is large enough to accommodate future crisis needs, private sector capital insurance may offer a better cost/risk trade-off than self-insurance. As history shows, however, this is a not inconsiderable "if". Further work would be needed to establish what size insurance scheme would genuinely augment the capital pool.

5. Conclusion

Over the course of the past 800 years, the terms of trade between the state and the banks have first swung decisively one way and then the other. For the majority of this period, the state was reliant on the deep pockets of the banks to finance periodic fiscal crises. But for at least the past century the pendulum has swung back, with the state often needing to dig deep to keep crisis-prone banks afloat.

Events of the past two years have tested even the deep pockets of many states. In so doing, they have added momentum to the century-long pendulum swing. Reversing direction will not be easy. It is likely to require a financial sector reform effort every bit as radical as followed the Great Depression. It is an open question whether reform efforts to date, while slowing the swing, can bring about that change of direction.

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ANNEX

Table 1: Support packages

($ Trillions)	UK	US	Euro
Central Bank			
- "Money creation"	0.32	3.76	0.98
- Collateral swaps	0.30	0.20	0.00
Government			
- Guarantees	0.64	2.08	>1.68
- Insurance	0.33	3.74	0.00
- Capital	0.12	0.70	0.31
Total (% GDP)	74%	73%	18%

Source: Bank of England *Financial Stability Report*, June 2009. Figures for UK updated to November 4th 2009.

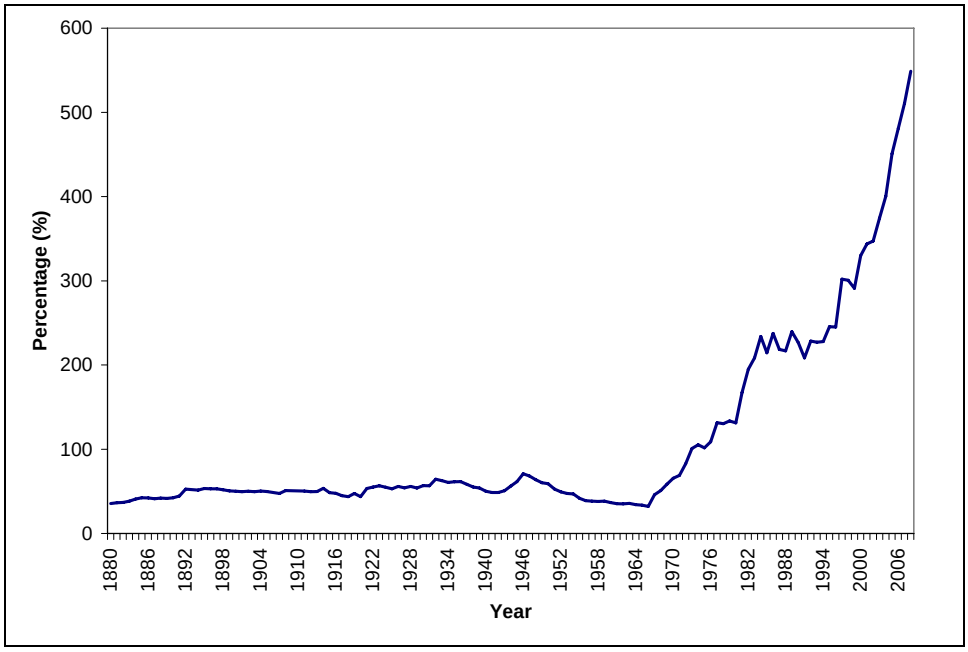
Notes: (1) Exchange rates used: FSR Euro / US dollar exchange rate of 0.710. Sterling / US dollar exchange rate of 0.613.
(2) Money creation includes both monetary and financial stability operations.

Table 2: Capital provision in past UK crises

Date	Crisis	Support recipient(s)	Reason for capital provision	Did UK clearing banks receive direct capital support?	Authority providing capital support	% of GDP at the time
1977	Secondary Banks	Slater Walker	Orderly resolution (wind down)		Bank of England	<0.1
1984	Johnson Matthey	Johnson Matthey	Orderly resolution (wind down)		Bank of England	<0.1
1994	Small banks	National Mortgage Bank	Orderly resolution (wind down)		Bank of England	<0.1
2008	Current crisis	RBS, LBG, Northern Rock	Mitigate systemic risk and promote lending		Treasury	~ 4

Source: Bank of England

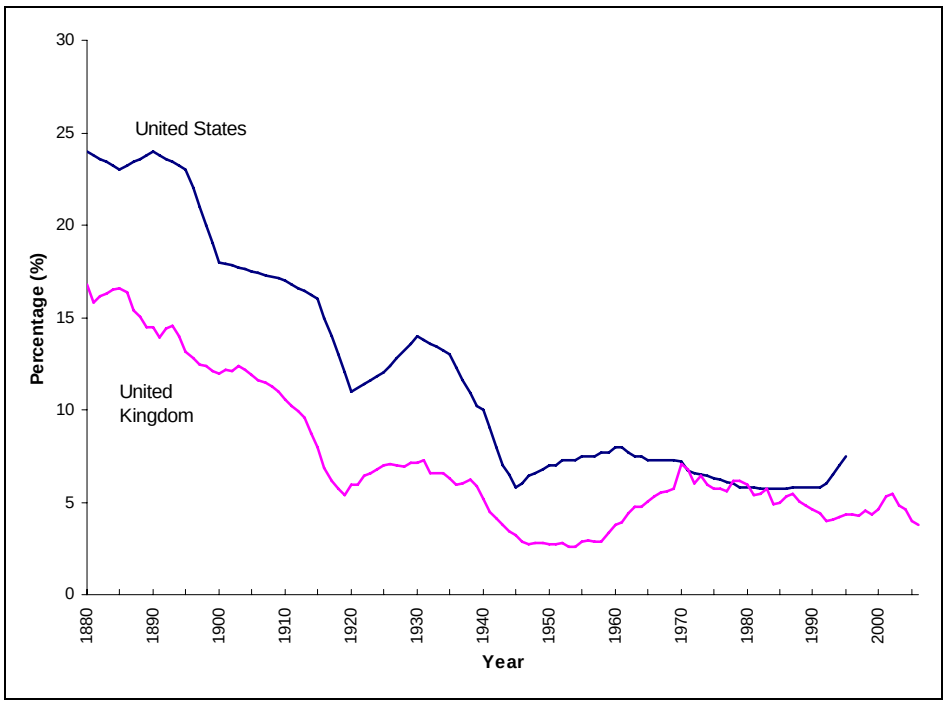
Chart 1: UK banking sector assets as % of GDP



Source: Sheppard, D. K (1971) and Bank of England.

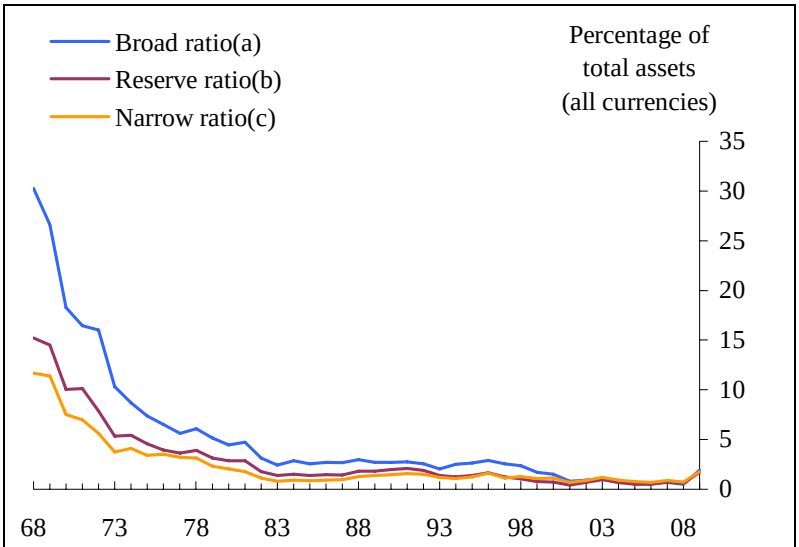
Note: The definition of UK banking sector assets used in the series is broader after 1966, but using a narrower definition throughout gives the same growth profile.

Chart 2: Capital ratios for UK and US banks



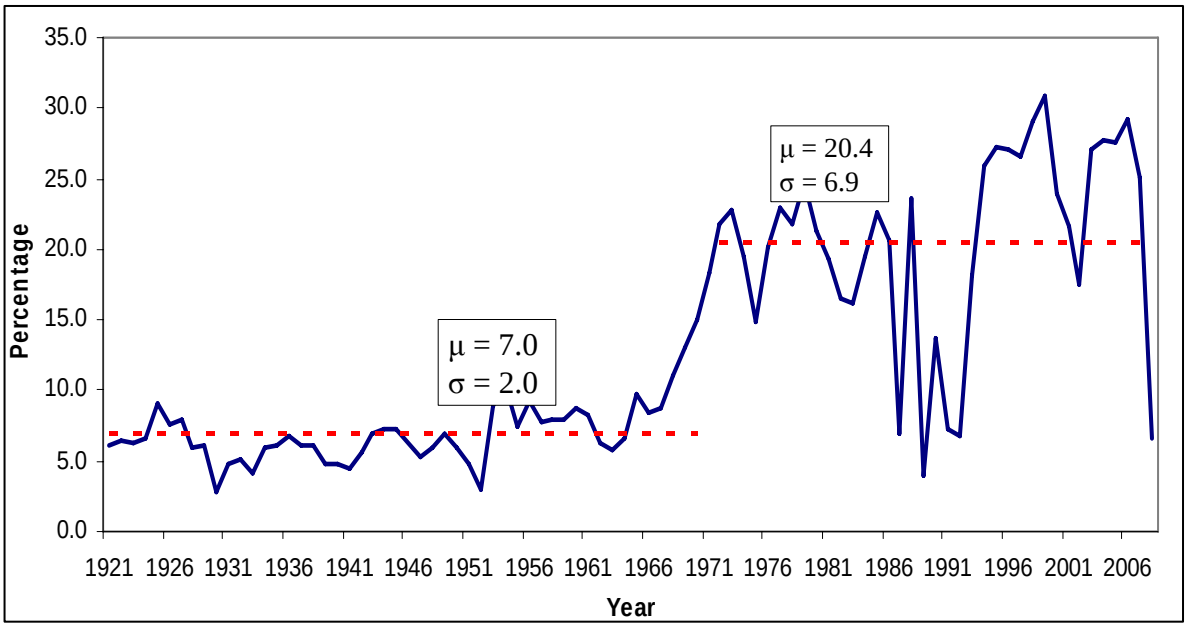
Source: US: Berger, A, Herring, R and Szegö, G (1995). UK: Sheppard, D.K (1971), BBA, published accounts and Bank of England calculations.

Chart 3: Sterling liquid assets relative to total assets



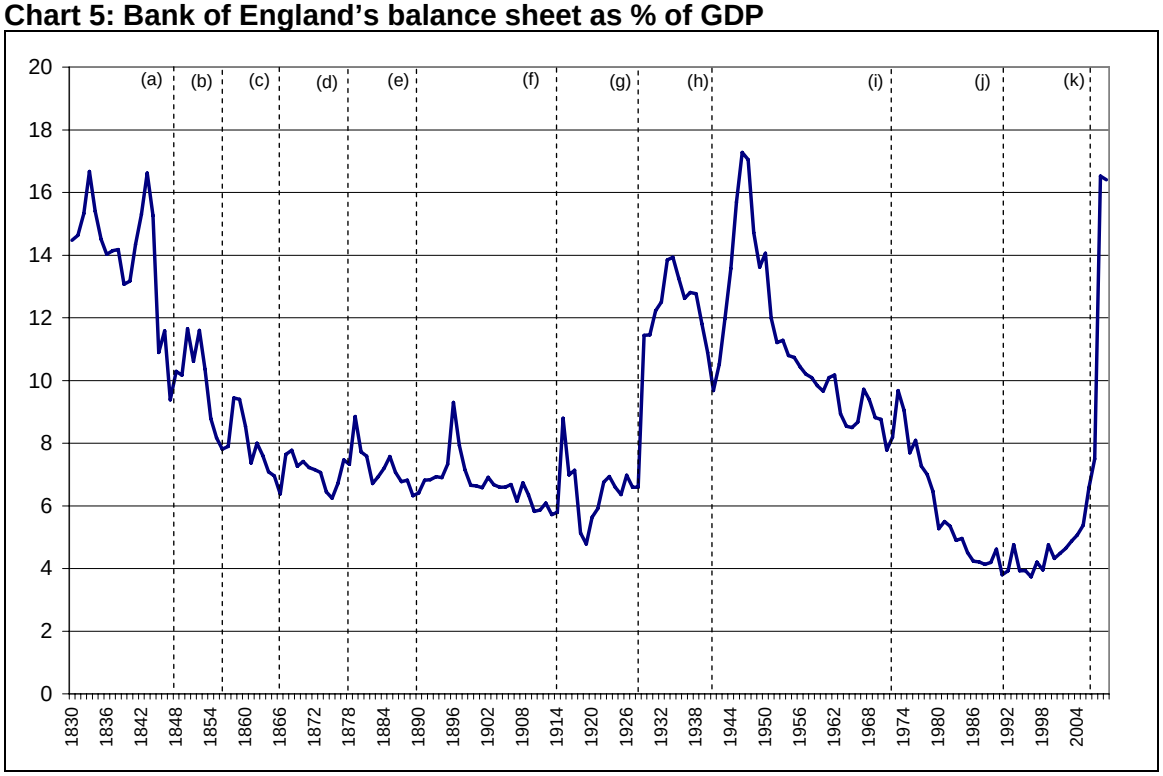
Sources: Bank of England and Bank calculations.
(a) Cash + Bank of England balances + money at call + eligible bills + UK gilts.
(b) Proxied by: Bank of England balances + money at call + eligable bills.
(c) Cash + Bank of England balances + eligible bills.

Chart 4: Return on equity for UK banks



Source: Capie, F. and Billings, M (2004), BBA and Bank of England calculations.
Note: There is a definitional change in the sample in 1967. The latter period has a slightly larger sample of banks and returns on equity are calculated somewhat differently, including being pre-tax.

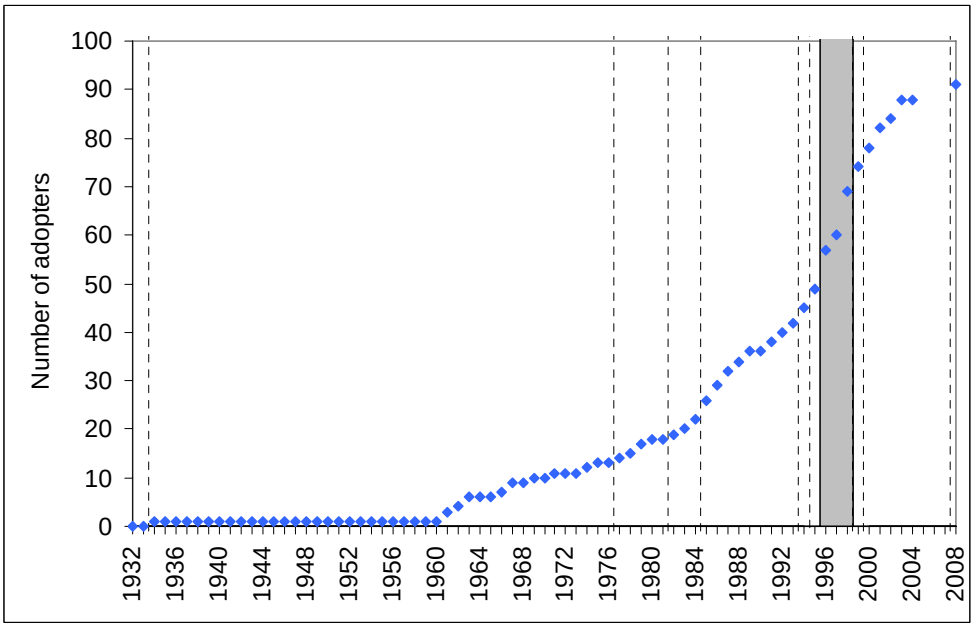
Chart 5: Bank of England's balance sheet as % of GDP



(a) Famine / End of railroad boom (1847)
(b) Overextension of credit from 1855-1866
(c) Failure of Overend Gurney (1866)
(d) Failure of City of Glasgow Bank (1878)
(e) Support for Barings (1890)
(f) WWI (1914)
(g) Currency and Bank Note Act (1928)
(h) World War II (1941)
(i) Secondary Banking Crisis (1973)
(j) Small Banks Crisis (1991)
(k) Current Crisis (2007)

Source: Bank of England.

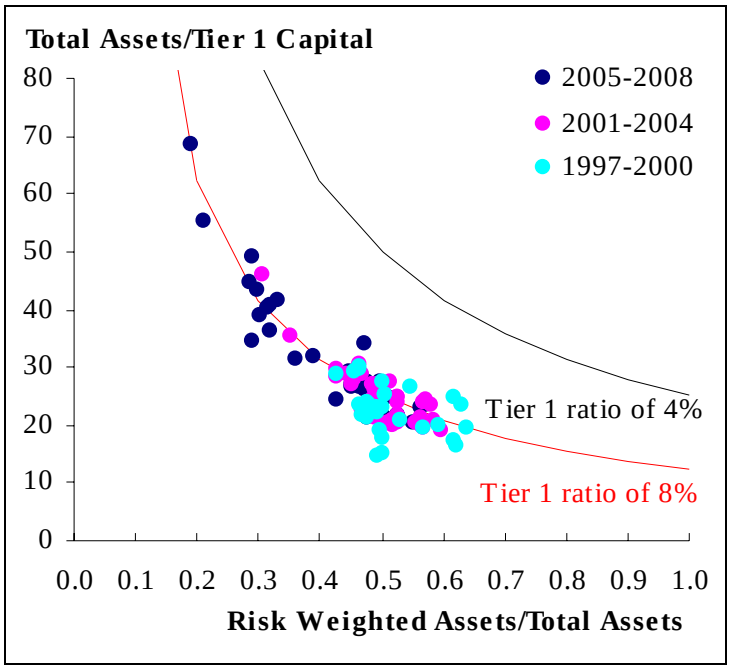
Chart 6: Number of deposit insurance schemes and crises



1934 – Great Depression (US)
1977 – Banking crisis (Spain)
1982 – Banking crisis (Kuwait)
1985 – Banking crisis (Kenya)
1994 – Banking crises (Czech Republic, Uganda)
1995 – Banking crises (Brazil, Bulgaria)
1996 – Banking crises (Belarus, Lithuania)
1996-1998 – Asian crisis (Indonesia, Korea, Malaysia, Thailand)
1998 – Banking crisis (Ukraine)
1999 – Banking crises (Ecuador, El Salvador)

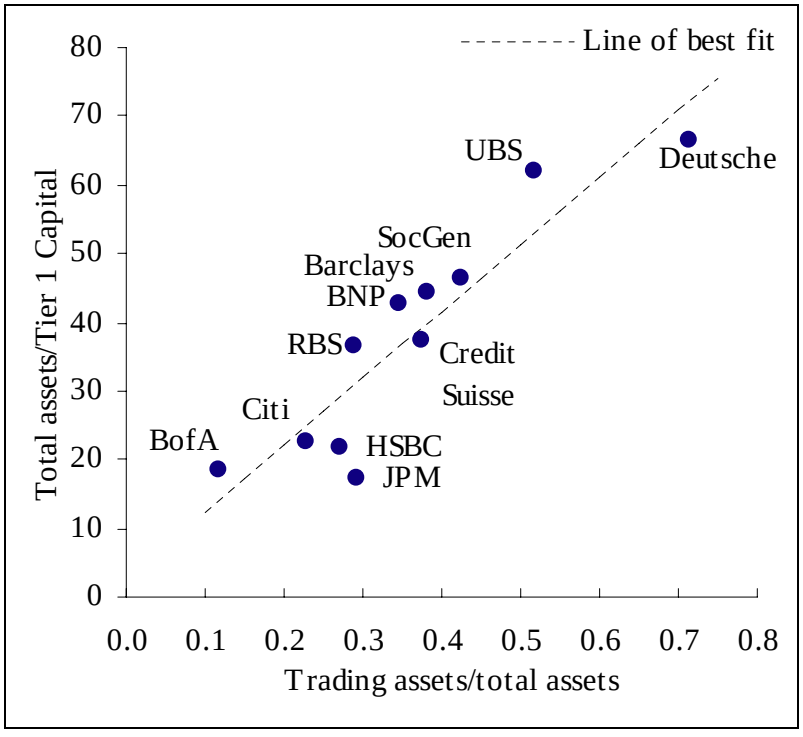
Source: Demirgüç-Kunt, A., Kane, E., and Laeven, L (2008); Laeven, L. and Valencia, F (2008).

Chart 7: Leverage and risk-taking in UK banks



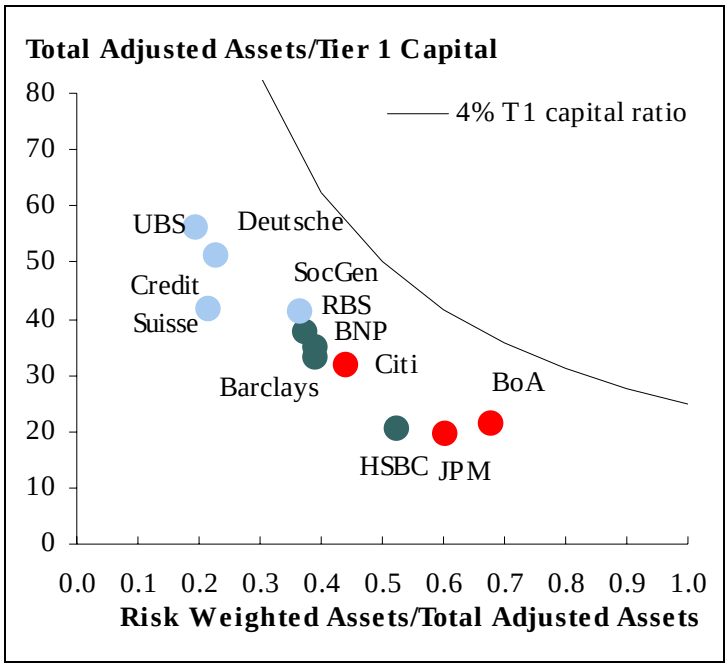
Source: Published accounts and Bank calculations.

Chart 8: LCFIs' trading portfolios and financial leverage – 2007



Sources: Published accounts and Bank calculations

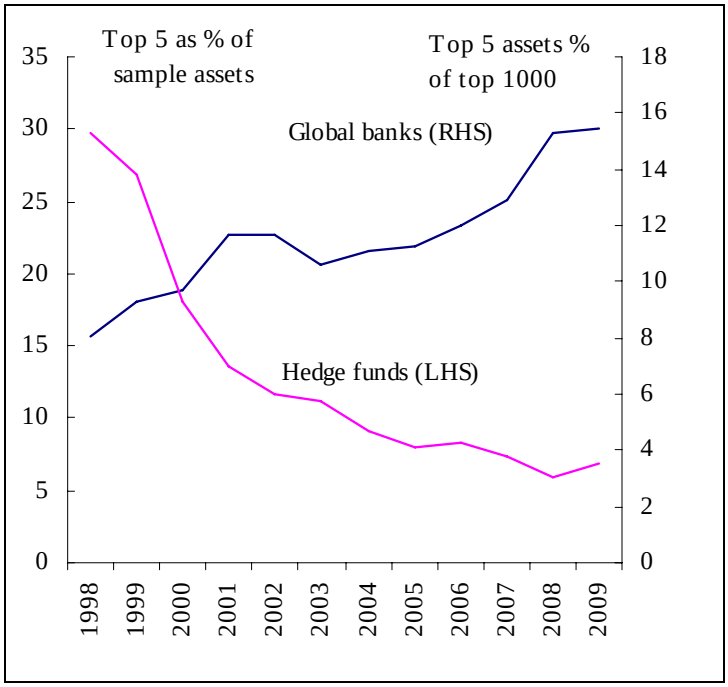
Chart 9: Leverage and risk-taking in international banks – 2007



Sources: Published accounts and Bank calculations.

Notes: These adjustments aim to ensure a common accounting treatment of exposures between US and European banks.

Chart 10: Bank and hedge fund concentration



Source: TASS and The Banker

Figure 1: Payoff profile for bank equity

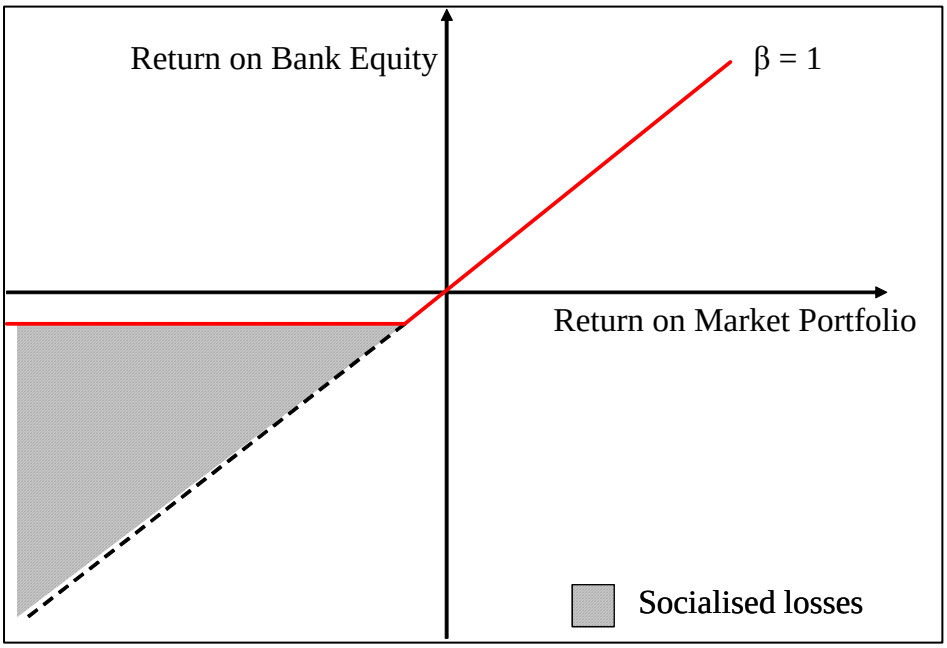


Figure 2: Payoff profiles for bank equity

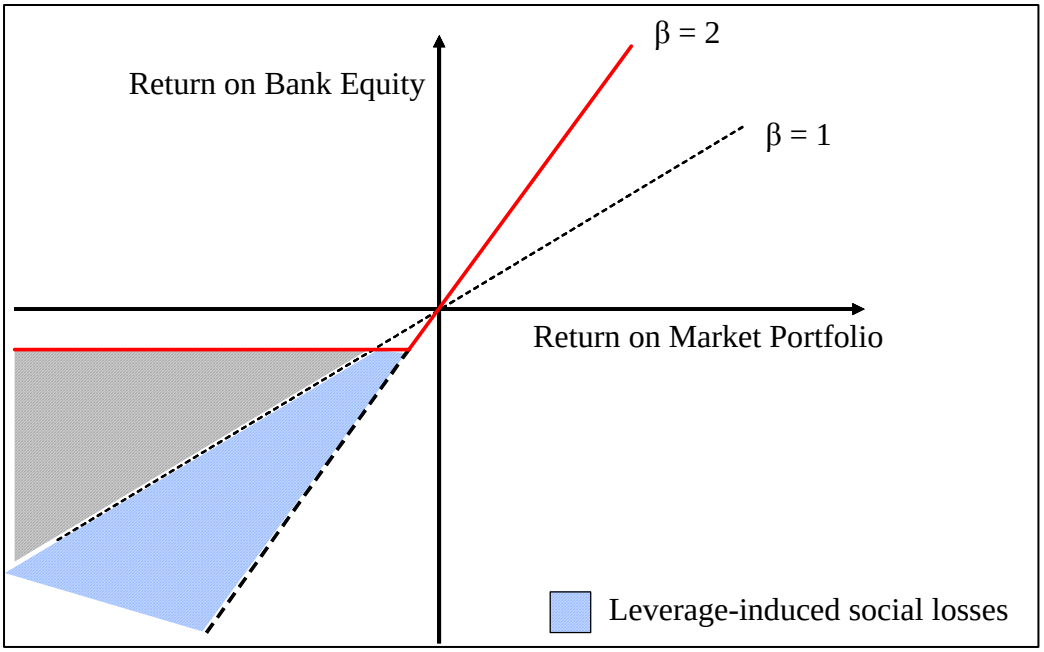


Figure 3: Payoff profile for bank equity