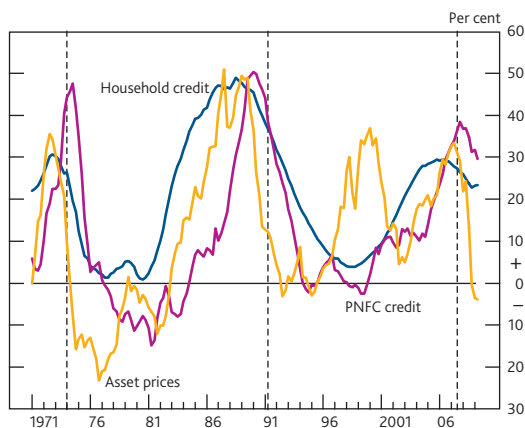


# 3 Safeguarding stability

Over the medium term, there needs to be a fundamental overhaul of the ‘rules of the game’ for the financial system, to deal with the root causes of systemic instability — a tendency for excessive risk-taking during the upswing of the credit cycle and insufficient resilience in the subsequent downturn. An expectation that ‘too important to fail’ firms will receive public assistance, or that unsecured wholesale creditors will not bear losses, exacerbates these risks. A policy response is required across three fronts: regulation, structure and resolution. These measures are complementary and pursuing them together would help establish a policy framework that is robust to future changes in behaviour.

Regulatory policies should give greater emphasis to systemic risks, across the cycle and across institutions. They should be complemented by structural measures to contain the spread of risk through the system, whether across firms or business activities. And because institutional failures cannot, and should not, be prevented, stronger resolution tools are required to limit disruption to the wider economy.

**Chart 3.1** Asset prices and credit growth in the United Kingdom<sup>(a)(b)(c)</sup>



Sources: Bank of England, Global Financial Data Inc., Halifax, Nationwide, ONS, Thomson Datastream and Bank calculations.

- (a) The chart shows ratios of real asset prices, household credit and private non-financial corporate credit to GDP, relative to their ten-year moving averages.  
 (b) The dashed lines show start dates for banking crises. The chart shows the secondary banking crisis, small banks crisis and the current crisis.  
 (c) Asset price index is a weighted average of real equity prices, real house prices and real commercial property prices, weighted according to national accounts data for holdings of assets.

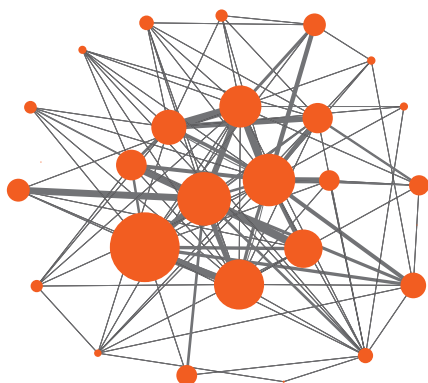
*The recent crisis reveals the need for fundamental reform of the financial system.*

Previous sections of this *Report* have discussed progress in restoring stability of the UK financial system and the near-term measures required to strengthen bank balance sheets. It is also necessary, over the medium term, to strengthen the foundations of the financial system to improve its resilience.

The financial system exists to provide services to the wider economy — payments, credit supply and insurance against risk. A stable financial system should ensure continuity of these services, even when faced with unanticipated shocks. There are two key sources of financial instability, evident in this and previous crises:

- Cyclical overexuberance — or ‘aggregate risk’ — brought about by a collective tendency for lenders and borrowers to take on excessive risk during the upswing of a credit cycle, only to become overly risk-averse during the subsequent downswing (Chart 3.1).
- The failure of individual banks to take account of the spillover effects of their actions on the financial system and wider economy — ‘network risk’ (Chart 3.2). A manifestation of this risk is the tendency for some institutions to become too important to fail.

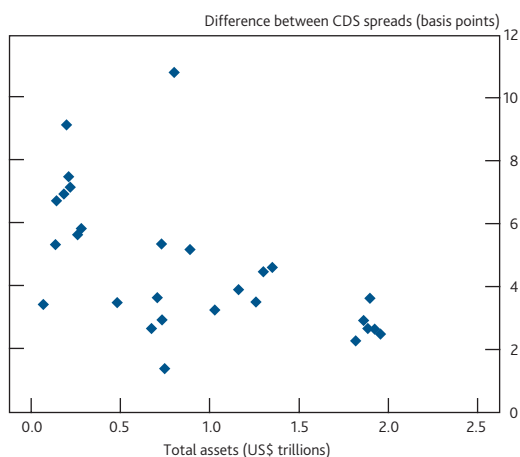
**Chart 3.2** Network of large exposures between UK banks<sup>(a)(b)(c)</sup>



Source: FSA returns.

- (a) A large exposure is one that exceeds 10% of a lending bank's eligible capital at the end of a period. Eligible capital is defined as Tier 1 plus Tier 2 capital, minus regulatory deductions.  
 (b) Each node represents a bank in the United Kingdom. The size of each node is scaled in proportion to the sum of (1) the total value of exposures to a bank, and (2) the total value of exposures of the bank to others in the network. The thickness of the line is proportional to the value of a single bilateral exposure.  
 (c) Based on 2009 Q2 data.

**Chart 3.3** Difference between senior and subordinated CDS spreads for major banks<sup>(a)(b)</sup>



Sources: Bankscope published by Bureau van Dijk Publishing, UBS Delta (Market Partners) and Bank calculations.

- (a) Sample includes 28 of the world's 100 largest banks by total assets, due to data availability.  
 (b) Data from end-2006 are used here to illustrate the pre-crisis relationship.

These sources of instability interact. In the run-up to the recent crisis, markets anticipated that government intervention might prevent the failure of larger banks and insulate creditors from losses (Chart 3.3). That appears to have weakened market discipline and encouraged risk-taking during the boom. It also weakened the resilience of the system in the subsequent downturn.

*A broad range of policy responses are currently under discussion...*

A large number of policy initiatives are currently under discussion, domestically at the Council for Financial Stability and internationally at the Financial Stability Board (FSB), the Basel Committee on Banking Supervision (BCBS) and the G20. The volume and diversity of the debate has raised concerns, including among some market participants, that policy measures will either be disproportionate or inadequately co-ordinated.<sup>(1)</sup> So it is important to consider how these different policy initiatives complement each other in combating systemic risk.

The current policy agenda can be divided into three areas:

- Regulation: including tighter capital and liquidity requirements to restrain risk-taking activities by increasing their cost.
- Structure: measures to improve the resilience of the financial system to network risk by encouraging greater use of central clearing and through steps to ensure the continuity of key financial services in the event of stress.
- Resolution: improvements to arrangements for dealing with financial problems when they emerge, including to ensure that unsecured wholesale creditors incur losses in the resolution of a distressed institution.

No single set of policy measures is a panacea. Regulatory standards are difficult to calibrate accurately and standards may be eroded over time as markets innovate and memories of past crises fade. Similarly, efforts to draw boundaries around certain banking activities can become ineffective if they lead to the emergence of too important to fail institutions operating outside the boundary. And no set of policy tools could, or should, eliminate the risk of institutional failures, necessitating robust resolution arrangements.

*...and should be pursued in parallel.*

A logical response to these challenges is to adopt a robust approach, with complementary policy measures across all three fronts. There are also important interdependencies

(1) Nearly half of all respondents to the Bank's November 2009 *Systemic Risk Survey* highlighted regulatory and accounting changes as a key risk to the UK financial system (see Table C in the Overview).

between these measures, particularly when aimed at containing network risk. For example:

- Some proposals for structural change are, in effect, stricter forms of regulatory reform — for example, requiring banks to hold only highly liquid, low-risk assets ('narrow banking') is equivalent to a 100% liquidity requirement.
- Regulatory requirements and structural measures would both tend to result in fewer institutions that are 'too important to fail', thereby increasing the effectiveness of resolution arrangements.
- Resolution arrangements that ensured that unsecured wholesale creditors bore losses in the event of a bank failure should reduce risk-taking behaviour by sharpening market discipline, complementing regulatory action.

This section of the *Report* discusses how policy initiatives in each area can contribute to tackling the root causes of this and many previous crises.

### 3.1 Regulatory arrangements

Suitably designed prudential regulation can play a key role in reducing network risk and cyclical overexuberance. A notable missing ingredient in the current policy framework is a set of tools targeted explicitly at systemic risk. That is the role of macroprudential policy. But any macroprudential framework needs, importantly, to build on effective microprudential standards.

*Reforms to microprudential standards should consider banks' entire capital structure...*

The starting point for microprudential reforms should be a broad reassessment of the structure of banks' liabilities. Excessive leverage and maturity transformation in the banking system were key propagation mechanisms during the crisis. Equity buffers were too small, while other liabilities (including lower-quality capital instruments) were not always able to absorb losses. And banks were overreliant on short-term wholesale liabilities to fund illiquid assets, relative to more stable sources of borrowing such as insured deposits.

The Financial Services Authority (FSA) is currently consulting on a range of proposals to strengthen the prudential capital regime in the United Kingdom.<sup>(1)</sup> And the international regulatory community, largely under the auspices of the BCBS, has embarked on a wide-ranging review of prudential capital and liquidity standards (Table 3.A). The BCBS will be undertaking a comprehensive quantitative impact study during 2010 to assess the cumulative effect of these reforms. In

#### Regulation could be strengthened through:

- Higher minimum capital requirements, comprising instruments that can absorb losses such as equity, or contingent capital that converts to equity automatically in a pre-defined way.
- Appropriately defined mandatory maximum leverage ratios to complement risk-weighted capital requirements.
- Requiring banks to hold large buffers of reliably liquid assets, and complementary measures to reduce banks' dependence on short-term wholesale borrowing to fund illiquid assets.
- Reducing overreliance on external credit ratings, potentially through regulatory incentives.
- Better disclosure, for example with regard to liquidity positions and exposures between financial institutions.
- The use of macroprudential tools to combat the build-up of risk over the credit cycle and across firms, as outlined in a recent Bank Discussion Paper.

**Table 3.A** BCBS workstreams on reform of prudential standards

#### Workstream

Raise the quality, consistency and transparency of the Tier 1 capital base.

Introduce a leverage ratio as a supplementary measure to the Basel II risk-based framework.

Introduce a framework for countercyclical capital buffers above the minimum requirement.

Assess the need for a capital surcharge to mitigate the risk of systemic banks.

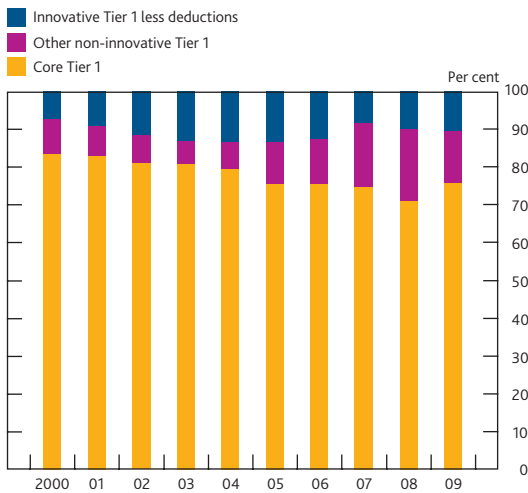
Review minimum levels of capital.

Review the treatment of counterparty credit risk in Basel II.

Introduce a minimum global standard for funding liquidity that includes a stressed liquidity coverage ratio requirement, underpinned by a longer-term structural liquidity ratio.

(1) See FSA (2009), 'Strengthening capital standards 3', *Consultation Paper 09/29*.

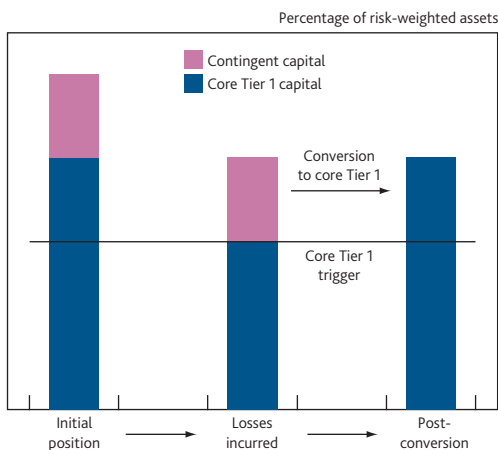
**Chart 3.4** Composition of the major UK banks' Tier 1 capital<sup>(a)(b)(c)(d)</sup>



Sources: Dealogic, published accounts and Bank calculations.

- (a) 2009 data refer to end-H1.  
 (b) Includes Abbey National, Alliance and Leicester and Bradford and Bingley instead of Banco Santander.  
 (c) Due to data availability, Nationwide is included after 2000 and The Co-operative Bank after 2001. Abbey National and Alliance and Leicester are not included in 2009 H1.  
 (d) Northern Rock and Bradford and Bingley are excluded in 2008 and 2009 H1.

**Chart 3.5** Stylised diagram of contingent capital with a core Tier 1 trigger



Source: Bank of England.

calibrating new standards, the higher cost to banks and their customers needs to be weighed against the benefit of reducing the probability of future systemic crises.

*...including improvements in the quality of banks' capital...*

Ahead of the crisis, the composition of banks' capital shifted away from common equity and reserves (core Tier 1 capital) towards lower-quality instruments (Chart 3.4). Experience during the crisis in the United Kingdom and elsewhere has revealed that these instruments were not always able to absorb losses for going-concern banks.

There is now broad agreement internationally that equity and reserves should form a much larger part of banks' capital in the future. The Bank believes that no instrument should be classified as going-concern capital if it does not have the same loss-absorbing characteristics as common equity. In practice, this means either that the principal of the instrument can be written down at the same time and to the same extent as common equity, or that the instrument is convertible into equity — so-called 'contingent capital'.

*...possibly through a bigger role for instruments with mandatory conversion to common equity.*

Contingent capital is any instrument that would convert into common equity upon a pre-defined trigger (Chart 3.5), similar in principle to the recent issuance of Enhanced Capital Notes by Lloyds Banking Group. Contingent capital would, in effect, act as a mechanism for banks to purchase capital insurance from the private sector rather than relying on public sector support. It would also be a way for banks to hold (contingently) higher levels of capital at a lower cost than pure equity.

On what terms private non-bank investors would be willing to provide such insurance remains unclear. For example, investor appetite may initially be restricted if these instruments are excluded from benchmark indices or are not permitted under certain investment mandates. If, over time, an investor base for such instruments did not develop, this would provide a useful signal that debt investors were unwilling to accept losses on their investments in banks.

For contingent capital instruments to be loss-absorbing, their design needs careful consideration. In this respect, the definition of the conversion trigger is crucial. Contingent capital would need to convert automatically, or at the discretion of the regulator, rather than on the initiative of the issuer. Setting the trigger involves balancing the risk of conversion too soon (before capital is needed) and too late (when funding problems may already have emerged). The acceptable level of contingent capital within banks' capital structure also needs to be considered carefully. Too much convertible debt could increase the risk of a bank equity price 'death spiral' — whereby investors may short-sell the stock in

anticipation of dilution as the trigger for conversion comes closer.

This approach would result in a dramatic simplification of banks' capital structures. All capital would in effect be equity, actual or contingent. And the distinction between Tier 1 and Tier 2, as well as upper and lower tiers, would be removed. The Bank believes such a simplification of capital structures would be desirable. It would also be more robust to regulatory arbitrage over time, by reducing the number of arbitrary boundary points.

#### *Minimum capital requirements also need to rise...*

An improvement in the quality of banks' capital needs to be accompanied by a higher aggregate level of capital relative to the size and riskiness of the banking system. The period since the 1960s has seen a trend decline in banks' capital buffers (Chart 3.6). That trend now needs to be reversed.

It is impossible to know with any precision how much capital might be needed in the future to maintain confidence in the financial system. This will vary through time and depend on future shocks to the system. But, as discussed in Box 5 in Section 2, past financial crises point to the need for considerably higher capital buffers to ensure banks are resilient to future stress.

#### *... complemented by restrictions on leverage...*

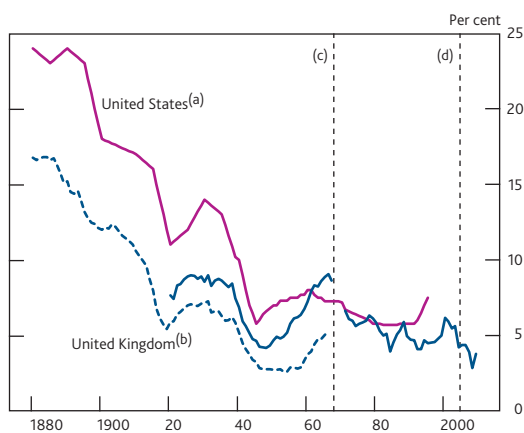
There is a strong case for complementing risk-weighted capital requirements with a maximum leverage ratio to provide a fallback constraint on risk-taking in the banking system. The current Basel II framework seeks to align regulatory capital with economic risk. But it has proven susceptible to measurement error and gaming by banks. Prior to the crisis, banks expanded their balance sheets by increasing their exposures to assets where risk was underestimated to take advantage of lower capital charges. The result was the emergence of a riskier, more highly leveraged banking sector than risk-weighted capital ratios appeared to suggest.

Box 6 explains the importance of applying a maximum leverage ratio alongside risk-based capital requirements. Provided that it can be suitably defined, the Bank supports the introduction of a maximum leverage ratio as a Pillar 1 requirement to ensure consistent implementation of capital standards across jurisdictions. To maximise its effectiveness, the leverage ratio should be simple and transparent so that it is comparable across banks and can be easily understood by stakeholders, thus enhancing market discipline. And it should be comprehensive, by including both on and off balance sheet items.

#### *... and a review of capital held against traded assets.*

Regulators are responding to the inadequacy of capital held against trading book positions in light of subsequent losses

**Chart 3.6** Long-run capital ratios for UK and US banks



Sources: United States: Berger, A, Herring, R and Szegö, G (1995), 'The role of capital in financial institutions', *Journal of Banking and Finance*, Vol. 19(3-4), pages 393-430. United Kingdom: Sheppard, D (1971), *The growth and role of UK financial institutions 1880-1962*, Methuen, London; Billings, M and Capie, F (2007), 'Capital in British banking, 1920-1970', *Business History*, Vol. 49(2), pages 139-62; British Bankers' Association, published accounts and Bank calculations.

- (a) US data show equity as a percentage of assets (ratio of aggregate dollar value of bank book equity to aggregate dollar value of bank book assets).
- (b) UK data on the capital ratio show equity and reserves over total assets on a time-varying sample of banks, representing the majority of the UK banking system, in terms of assets. Prior to 1970 published accounts understated the true level of banks' capital because they did not include hidden reserves. The solid line adjusts for this. 2009 observation is from H1.
- (c) Change in UK accounting standards.
- (d) International Financial Reporting Standards (IFRS) were adopted for the end-2005 accounts. The end-2004 accounts were also restated on an IFRS basis. The switch from UK GAAP to IFRS reduced the capital ratio of the UK banks in the sample by approximately 1 percentage point in 2004.

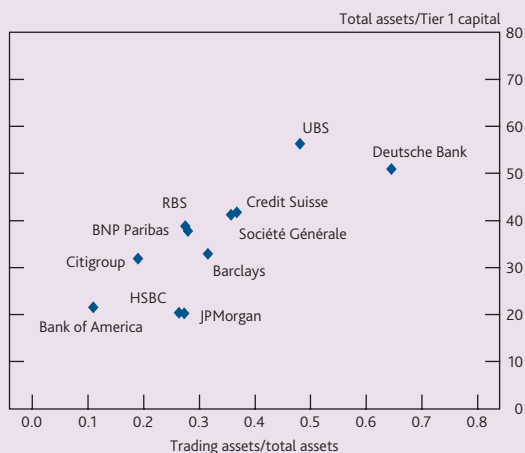
## Box 6 Leverage ratios

A *leverage ratio* is the total value of a bank's assets relative to its capital. The Basel Committee on Banking Supervision has agreed to introduce a leverage ratio to supplement existing risk-based capital requirements. This box considers the arguments in favour of the introduction of a leverage ratio and its possible impact on banks' behaviour.

### Risk-weighted capital ratios

Under existing Basel regulatory *capital rules*, banks must hold a minimum ratio of capital relative to the weighted risks of their portfolio of assets. This ratio does not place a direct constraint on leverage. If regulatory risk weights were perfectly calibrated, a risk-based capital requirement would be sufficient to constrain the riskiness of banks' balance sheets. In practice, regulatory risk weights have been subject to measurement error. During the recent crisis, risk models tended to underestimate the risk of trading portfolios, providing banks with an incentive to expand their trading activities. **Chart A** suggests that efforts to expand balance sheets through higher leverage were focused on trading assets, which were also thought to be very liquid.

**Chart A** LCFIs' ratios of total assets to Tier 1 capital and trading assets to total assets<sup>(a)(b)</sup>



Sources: Published accounts and Bank calculations.

- (a) Assets adjusted for cash and cash items in the course of collection from banks and deferred tax assets. Assets adjusted on best-efforts basis to ensure comparability between institutions reporting under US GAAP and IFRS. Derivatives are netted in line with US GAAP rules. Off balance sheet vehicles are included in line with IFRS rules (excluding mortgages sold to US government-sponsored entities).  
(b) Data as at end-2007.

### Leverage ratios as backstops

Excess leverage increases the sensitivity of banks' balance sheets to losses. The aim of a leverage ratio is as a 'backstop' to risk-based capital requirements, constraining banks' incentives to overleverage during the upswing of a credit cycle.<sup>(1)</sup> Although a number of countries currently employ leverage ratios as part of their regulatory toolkit, there is a marked divergence in their design and definition (**Table 1**). This

presents challenges in introducing a simple, non risk-based leverage ratio that ensures comparability across business models with inherently different asset exposures and across jurisdictions where the accounting treatment of such exposures varies. At minimum, a common definition of capital and an agreed measure of both on and off balance sheet assets, adjusted fully for accounting differences, are required.

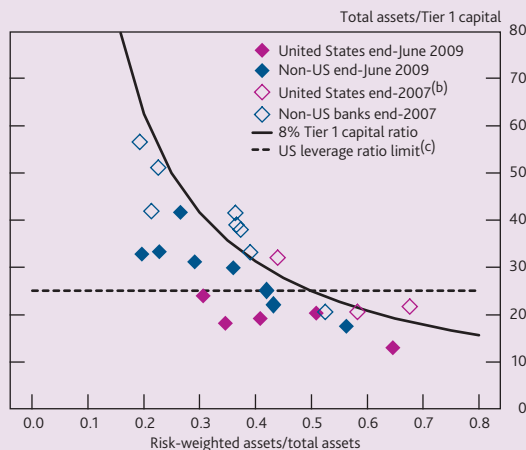
**Table 1** Summary of regulatory leverage ratio limits

United States	Tier 1 capital must be $\geq 3\%$ of <i>on balance</i> sheet assets for 'strong' bank holding companies (BHCs) and $\geq 4\%$ for all other BHCs.
Canada	Tier 1 and Tier 2 capital must be $\geq 5\%$ of <i>on balance</i> sheet plus qualifying <i>off balance</i> sheet assets for BHCs.
Switzerland	Tier 1 capital must be $\geq 3\%$ of <i>on balance</i> sheet assets less Swiss domestic lending for BHCs and $\geq 4\%$ for individual institutions. This is applicable only to Credit Suisse and UBS.

Source: IMF.

To be an effective backstop to a risk-based regime, the leverage ratio should be set at a level that binds only during periods of credit exuberance. Since a leverage ratio increases banks' incentives to invest in higher risk assets, its development must be complemented by a robust risk-based capital framework to ensure capital adequacy relative to risk. **Chart B** suggests that US banks subject to a leverage ratio, while appearing less leveraged in a simple sense than banks operating in other jurisdictions, invested in higher risk assets.

**Chart B** LCFIs' ratios of total assets to Tier 1 capital and risk-weighted assets to total assets<sup>(a)</sup>



Sources: Published accounts and Bank calculations.

- (a) See **Chart A**, footnote (a).  
(b) Excludes the US securities houses.  
(c) US leverage ratio limit proxied by a ratio of Tier 1 capital to total assets of 4%. The inclusion of qualifying off balance sheet assets places some US LCFIs above the leverage ratio limit.

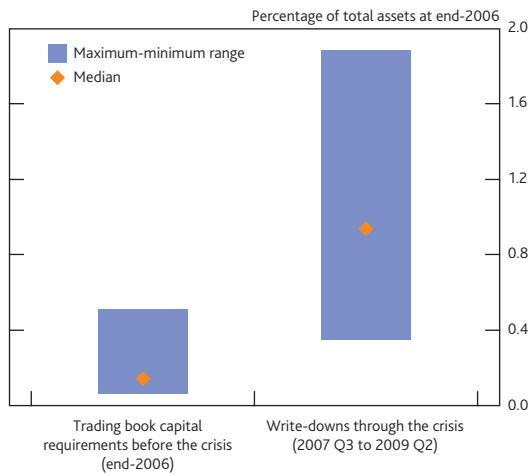
### A Pillar 1 requirement

The Bank would support the introduction of a leverage ratio and this being hard-wired into regulatory rules through Pillar 1, provided that it can be well defined. It will be difficult to set a single standard applicable across different business models and accounting regimes, but it is important to achieve consistent implementation across jurisdictions.

(1) See Section 3 and 'The role of macroprudential policy', *Bank of England Discussion Paper*, November 2009.



**Chart 3.7** Trading book capital requirements and write-downs across UK and European LCFIs<sup>(a)(b)(c)</sup>



Sources: Published accounts and Bank calculations.

- (a) Includes six UK and European LCFIs that reported trading book risk-weighted assets at end-2006.  
 (b) Cumulative write-downs due to mark-to-market adjustments where disclosed by firms.  
 (c) Not all assets accounted for on a fair-value basis will be part of the regulatory trading book. So the chart is likely to overstate write-downs originating in the regulatory trading book.

(Chart 3.7). In July, the BCBS announced a set of revisions to the Basel II market risk framework, which will lead to significant increases in capital requirements against market risk.<sup>(1)</sup> But deep-seated potential fault-lines in the regulatory framework for dealing with traded assets also need to be mitigated. The boundary between trading and banking books was a source of arbitrage ahead of the crisis. Banks classified as part of their trading books a growing range of illiquid assets, such as structured credit products, that would have received much higher capital charges under banking book rules.

The appropriate capital treatment of traded assets is due to be considered by the BCBS as part of a fundamental review of the trading book. Irrespective of whether an explicit regulatory boundary remains, the Bank believes that capital charges on traded assets should probably depend on two key factors. First, banks' trading intentions — assets purchased with the intent to hold to maturity should not be treated differently from non-tradable positions. Second, liquidity in the markets for traded assets, which will depend on the specific characteristics of the market where the relevant instrument is traded, as well as the instrument itself.

*The cost of higher capital may be lower than usually believed.*

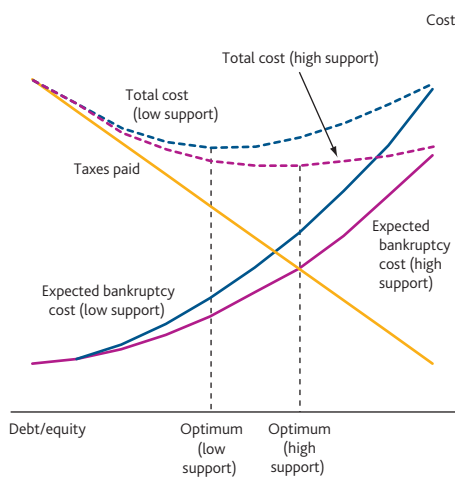
Raising more equity to satisfy tighter regulatory requirements will likely entail costs for banks and borrowers. The preferential tax treatment of debt over equity reduces the relative cost of debt and acts as an incentive for all firms, including banks, to increase leverage. But higher leverage also increases the probability of default, and hence the cost of debt finance, as expected bankruptcy costs rise. The optimal capital structure of any firm will balance these two effects. Regulatory requirements that impose a different allocation between equity and debt naturally imply some costs.

For banks, the relative attraction of debt over equity has been further strengthened by an expectation that government support would shield some creditors from incurring losses. Implicit support of this kind lowers expected bankruptcy costs and increases the optimal level of leverage. Successful policy action to ensure unsecured wholesale creditors are genuinely exposed to losses would reduce this effect. In principle, this should reduce the additional cost to banks of issuing equity rather than debt and, so, limit the difference between a firm's privately optimal capital structure and that imposed by regulatory standards (Chart 3.8).

*Banks should hold larger liquid asset buffers...*

The need for massive central bank liquidity support throughout the current crisis has clearly exposed banks'

**Chart 3.8** Impact of taxes and expected bankruptcy costs on banks' cost of capital<sup>(a)</sup>

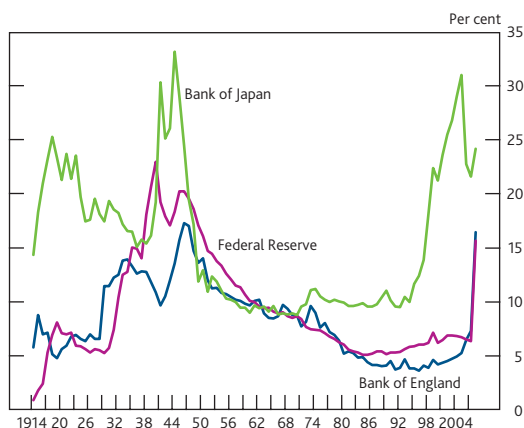


Source: Bank of England.

- (a) 'High support' refers to high expectations of government support and 'low support' refers to low expectations of government support.

(1) See BCBS (2009), 'Revisions to the Basel II market risk framework' and BCBS (2009), 'Analysis of the trading book quantitative impact study'.

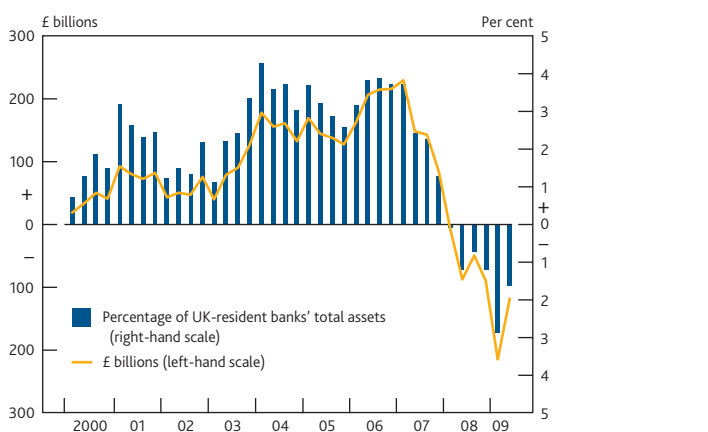
**Chart 3.9** Central banks' balance sheets as a percentage of GDP<sup>(a)</sup>



Sources: Bank of England, Bank of Japan, Federal Reserve, Thomson Datastream, www.measuringworth.org and Bank calculations.

(a) Bank of England balance sheet data: end-February 1914–66, end-year 1967–2008. UK GDP: annual data (nominal). Federal Reserve balance sheet data: end-year 1914–81, end-July 1982–95, end-year 1996–2008. US GDP: annual data (nominal). Bank of Japan balance sheet data: end-year. Japan GDP: annual data (nominal). Between 1914–51 National Income is used as a proxy for Japan's GDP. The National Income data point for 1945 is unavailable and estimated by the average of the 1944 and 1946 data points.

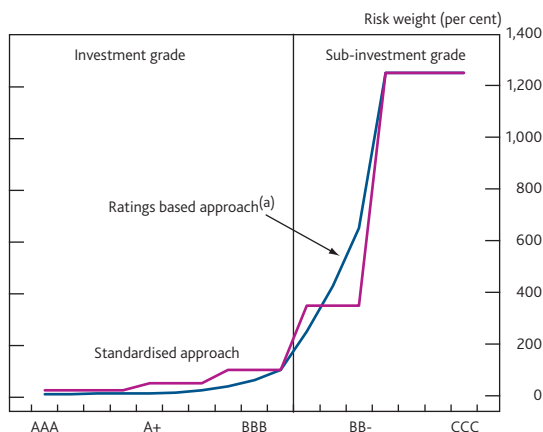
**Chart 3.10** Annual growth in interbank liabilities of UK-resident banks<sup>(a)</sup>



Source: Bank of England.

(a) Interbank liabilities are defined as sight and time deposits from, and liabilities under repo to, other UK banks and building societies.

**Chart 3.11** Risk weights for securitisations in the Basel II framework



Source: BIS.

(a) Base risk weights for securitisation exposures that are externally rated.

vulnerability to liquidity shocks (Chart 3.9). Underpricing of liquidity risk and excessive short-term borrowing from wholesale markets exacerbated cyclical fluctuations in the supply of credit. And, to the extent that wholesale debt funding was provided by other banks, it also contributed to the build-up of network risk, amplifying shocks in the crisis (Chart 3.10).

The June 2009 Report set out the high-level principles that the Bank believed should guide the design of prudential liquidity regulation. These principles are consistent with the United Kingdom's new liquidity regime, published by the FSA in October.<sup>(1)</sup> The FSA policy aims to ensure that banks hold large buffers of high-quality, unencumbered securities that can be reliably traded or exchanged in private markets, including in stressed circumstances.

*...and fund themselves from relatively stable sources.*

Reducing the reliance of the banking system on volatile sources of borrowing to fund illiquid assets is also important. A structural funding ratio could achieve that, by ensuring that a significant proportion of banks' loans were financed from more stable sources of funding, such as retail deposits and long-term wholesale liabilities. Such a requirement is currently being developed internationally as part of the introduction of global minimum liquidity standards by the BCBS. A careful impact assessment will be required to calibrate the new liquidity requirements. And, given the remaining fragilities in the financial system, tightening of liquidity regulation will also need to be phased in over a number of years.

*Regulatory reforms should reduce banks' reliance on external ratings...*

Regulatory reforms should also encourage stronger risk management within banks. By relying on external ratings, firms effectively delegate a key economic function of banking — the assessment and monitoring of borrowers — to rating agencies. Prudential standards could be reframed to provide capital incentives to banks that use both internal and external ratings, with a view to significantly reducing the reliance of the Basel II capital framework on external ratings over time.

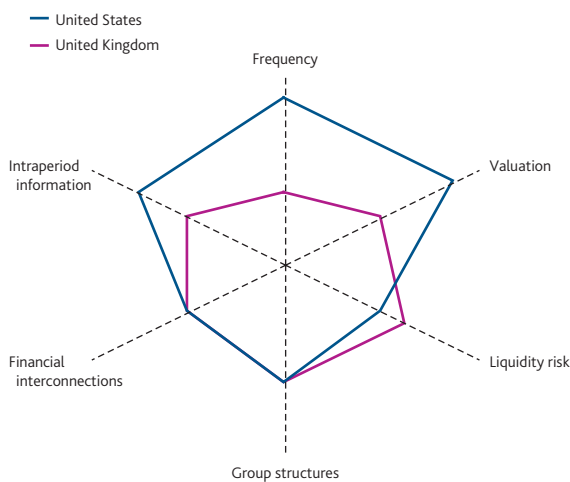
Reducing banks' common dependence on the same external ratings would limit the collective tendency of the financial system to underestimate risk in the upswing, as was evident for example in the ratings of structured credit products ahead of the recent crisis. It would also contribute to reducing procyclicality in minimum capital requirements by addressing the 'cliff effects' caused by rating downgrades in a downturn — for example, as ratings fall below investment grade (Chart 3.11).

(1) See FSA (2009), 'Strengthening liquidity standards', Policy Statement 09/16.



**Table 3.B** Areas for improved disclosure

Valuation	Explanation of fair-value techniques, particularly when there are no direct market observables. Quantitative information on inputs used for key assumptions, including sensitivity analysis.
Liquidity risk	More granular information on the maturity structure and liquidity risk profile of firms' balance sheets and on firms' holdings of liquid assets.
Group structures	Detailed information on balance sheets and profitability of key group affiliates, particularly in the case of large and complex financial groups.
Financial interconnections	Granular information on assets and liabilities to different types of financial institutions, split by the nature of the exposure.
Intraperiod information	Period averages and highs/lows to present a window on the risks that institutions run during reporting periods.
Frequency	More quantitative balance sheet information on a quarterly basis.

**Chart 3.12** Disclosure practices in selected areas of financial reports for large US and UK banks<sup>(a)(b)(c)</sup>

Sources: Published accounts and Bank calculations.

- (a) The sample uses five of the largest US and five of the largest UK commercial banks by total assets.
- (b) This chart summarises an assessment of quantitative information disclosed on fair-value methodologies (Valuation), liquidity risk profiles (Liquidity risk), legal structure and risk positions of key group affiliates (Group structures), exposures between financial institutions (Financial interconnections), period averages, highs and lows (Intraperiod information) and frequency of comprehensive reports (Frequency).
- (c) 2008 and 2009 interim reports (SEC quarterly filings in United States, Interim Management Statements and semi-annual reports in United Kingdom) were used to assess Frequency. 2008 annual reports were used for all other areas.

...and encourage improved disclosure practices.

Reliable, timely and granular information is essential for banks' own risk management and for market discipline to be effective. Better information would have constrained excessive risk-taking behaviour in the run-up to the crisis. And, in stressed times, it would have helped reduce market uncertainty.

There are a number of areas where significant improvements in disclosure would be desirable (Table 3.B), notably liquidity risk, where more granular information is required on the maturity structure of banks' balance sheets and their holdings of liquid assets. Banks should also disclose better information on their exposures to, and funding from, other financial institutions to help constrain network risk.

The Bank welcomes efforts to improve the quality of disclosure in the United Kingdom, such as the British Bankers' Association Code for Financial Reporting Disclosure introduced in a recent FSA Discussion Paper.<sup>(1)</sup> But disclosure practices in the United Kingdom lag those in other countries, including the United States (Chart 3.12). Some level of prescription on disclosure standards may be necessary if principle-based approaches prove insufficient.

*Macroprudential instruments should target systemic risk...*

If prudential regulation is calibrated to individual institutions' balance sheet characteristics, it may overlook the build-up of risk across the system as a whole. Macroprudential instruments might fill a gap in the current policy framework between macroeconomic policy on the one hand and microprudential policy on the other. In a recent Discussion Paper (DP), the Bank contributed to emerging ideas on how such a macroprudential regime could be made operational.<sup>(2)</sup>

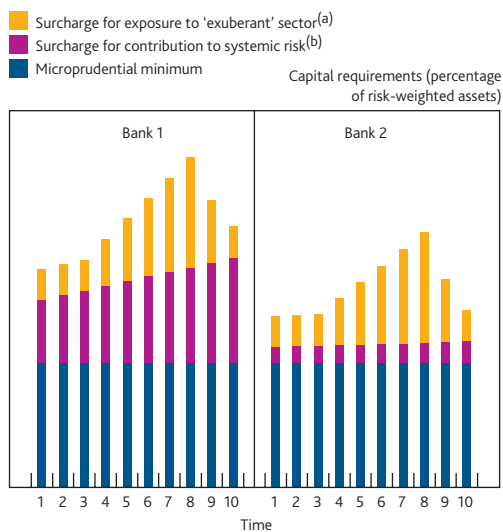
The DP examined the possibility of applying time-varying capital surcharges on banks to dampen cyclical exuberance (the orange bars in the stylised example in Chart 3.13). Raising capital requirements in a credit boom would offer greater self-insurance for the financial system against a subsequent bust. It could also provide incentives for banks to restrain exuberant lending by raising its marginal cost.

In addition, the DP suggested that capital surcharges could be imposed on firms to better reflect their individual contribution to systemic risk (the magenta bars in Chart 3.13). These could be based on factors such as firms' size, complexity, interconnectedness and propensity to cause losses to others through asset fire sales. The key objective would be to lower the probability of default of banks whose failure would impose a large spillover cost on the financial system. Systemic

(1) See FSA (2009), 'Enhancing financial reporting disclosures by UK credit institutions', Discussion Paper 09/5.

(2) See 'The role of macroprudential policy', Bank of England Discussion Paper, November 2009.

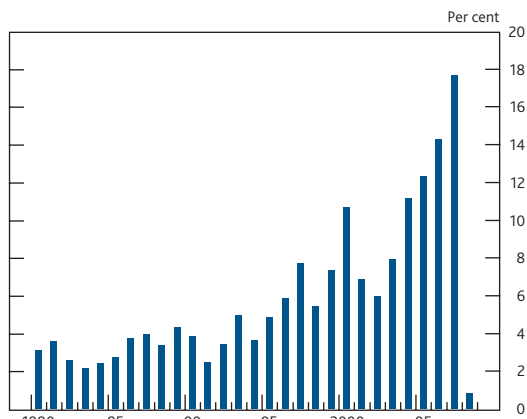
**Chart 3.13** Stylised representation of a macroprudential regime based on capital surcharges



Source: Bank of England.

- (a) Cyclical surcharge on sector that becomes increasingly exuberant through periods 4–8.  
 (b) Surcharge based on the contribution of each bank to systemic risk. Bank 1's contribution is assumed to be large and slowly rising through periods 1–10. Bank 2's contribution is assumed to be smaller throughout.

**Chart 3.14** Global cross-border capital flows (percentage of world GDP)<sup>(a)</sup>



Sources: IMF *World Economic Outlook* and Bank calculations.

- (a) Sum of purchases of foreign assets by domestic residents.

#### Structural changes to support stability could include:

- Extension of central counterparty (CCP) clearing for financial contracts, backed up by robust CCP risk management.
- Development of capital markets to reduce economic dependency on credit intermediated by the banking system.
- Insulation of core financial services — such as payments and credit provision — from disruption stemming from other activities, and removal of the expectation of government support for wholesale creditors.

surcharges could also provide incentives for banks to alter their balance sheets or business models, supporting structural initiatives in this area (see Section 3.2).

*...although significant operational challenges still need to be overcome.*

Calibrating macroprudential surcharges in practice would be a considerable challenge. Policymakers would need to consider trends in the real economy, developments in the financial system, and the interaction between the two. They would need to draw on quantitative data, analysis, market intelligence and modelling. That suggests macroprudential policy decisions are likely to require a substantial element of discretion. Such discretion could, however, be constrained by placing macroprudential choices within an explicit policy regime.

International leakages could limit the effectiveness of a macroprudential regime in practice. Given the free flow of capital across borders (**Chart 3.14**), it is generally not possible to control tightly the quantity of credit to the real economy from abroad. But even without strong international co-ordination, macroprudential tools could still strengthen the resilience of the domestic banking system to future shocks.

## 3.2 Structure of the financial system

The regulatory measures discussed above aim to reduce the likelihood that banking system distress will undermine the stable provision of financial services to the real economy. But calibration challenges, coupled with the risk that regulatory standards might be eroded over time, suggest that they may not be sufficient by themselves. There is merit in considering structural measures to contain systemic risks.

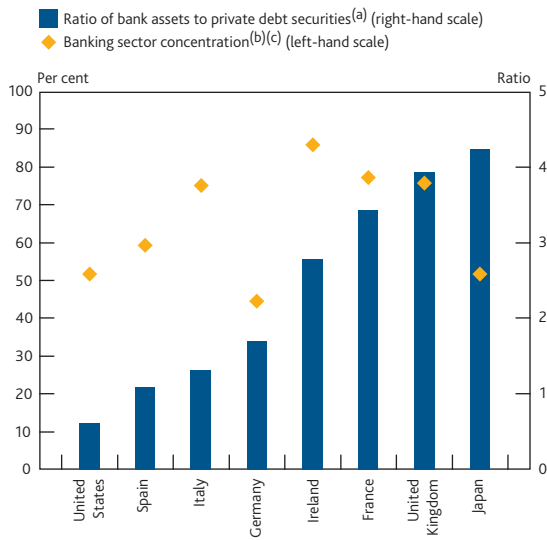
*More diversified funding sources for the real economy are required...*

Relative to other major economies, UK firms are heavily reliant on finance from a small number of large banks (**Chart 3.15**). Further development of alternative channels of intermediation, such as debt capital markets, could help smooth the credit cycle by reducing borrowers' dependence on bank finance. It would also reduce the economic disruption that would be caused by the failure of a major bank.

With these objectives in mind, HM Treasury has announced that it intends to publish a discussion paper on developing non-bank lending channels in the United Kingdom, drawing on advice from the FSA and the Bank.<sup>(1)</sup> Key issues to be considered include identifying necessary improvements to market infrastructure that will help corporate borrowers to access non-bank investors.

(1) See Chapter 3 of the Pre-Budget Report 2009.

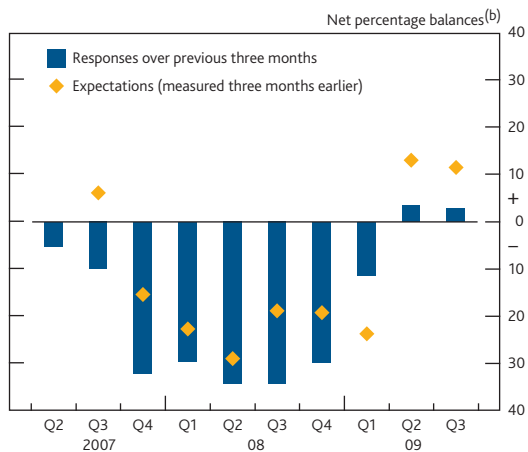
**Chart 3.15** Ratio of bank assets to private debt securities and concentration of domestically owned banking sectors



Sources: *The Banker*, Bankscope published by Bureau van Dijk Electronic Publishing, IMF and Bank calculations.

- (a) Bank assets defined as total assets of commercial banks, including subsidiaries. Data are for 2008.
- (b) Concentration defined as the three largest domestically owned banks' share of total domestically owned banking sector assets. This includes assets of domestic banks held abroad.
- (c) UK data are from Bankscope as at end-2008 and include all banks and building societies. Data for all other countries are from *The Banker's* ranking of the world's largest 1,000 banks as at end-2007. This measure will underestimate the size of banking systems that have a large proportion of banking sector assets outside of the list.

**Chart 3.16** Credit conditions for UK households and businesses during the financial crisis<sup>(a)</sup>



Source: Bank of England *Credit Conditions Survey*, 2009 Q3.

- (a) Net percentage balances are calculated by weighing together the responses of those lenders who answered the survey questions on the change in the availability of credit. A simple average has been taken across household secured, household unsecured and corporate lending.
- (b) A positive balance indicates that more credit is available.

*...but banks will remain the key provider of certain core financial services...*

Non-bank finance is a substitute for some of the financial services banks provide to the wider economy. But in other areas, notably payments and lending to households and small businesses, there are fewer alternatives available. Adequate safeguards are needed to ensure that bank failures do not unduly compromise the continuity of these financial services. Substantial government support for distressed banks, along with robust market infrastructure, have ensured that essential payment services have been largely uninterrupted during the present crisis. But these measures have not been able to prevent a sharp reduction in credit availability for UK households and businesses (Chart 3.16).

Losses incurred by banks should, to the fullest extent possible, fall on their shareholders and unsecured wholesale creditors before the taxpayer. Arrangements that insulate banks' utility services from disruption stemming from other types of banking activity would reduce the likelihood that government support will be needed to ensure continuity of these services.

*...and preserving the integrity of these services could be achieved in various ways.*

One way of ensuring continuity of payment services could be to require banks to invest retail deposits solely in risk-free assets such as government bonds — an approach commonly referred to as 'narrow banking'. A number of commentators have put forward proposals along these lines in response to the crisis.<sup>(1)</sup> This could be seen as an extension of arrangements already in place for private banknotes issued by some Scottish and Northern Irish banks. These banks are required to hold cash or credit balances with the Bank of England fully backing their note issuance. These assets cannot be used for any other purpose and would be excluded — or 'ring-fenced' — from any insolvency proceeding and reserved for satisfying the claims of note holders.

An arrangement where retail deposits are backed by risk-free assets need not require the creation of dedicated narrow banks, although this could conceivably occur naturally over time. Existing banks could instead be required to segregate their retail deposit books and the assets backing them within their internal structures. The segregated part of a bank would effectively be subject to a 100% liquidity requirement, and would need to be easily extractable from the wider group using available resolution tools. In this way, the integrity of the payment system would be assured, while still allowing banks to exploit economies of scope between payment services and other types of banking activity.

(1) See, for example, Kay, J (2009), 'Narrow banking: the reform of banking regulation', Centre for the Study of Financial Innovation, September.

*Imposing restrictions on banks' activities is one possible option...*

Narrow banking is one particular form of a broader approach to improving the resilience of the financial system through structural change. More generally, utility financial services could be insulated from risks associated with other banking activities by imposing restrictions along two different dimensions:

- Business lines — the activities that different types of financial institution are permitted to undertake; and
- Geographical — the ways in which banks operate outside their home country.

Current regulatory arrangements impose relatively few restrictions on business lines and across geographical borders. For example, building societies must ensure that at least three quarters of their lending is secured against residential property, but otherwise UK financial institutions are generally free to engage in a wide range of activities. In the geographical dimension, European law allows banks incorporated in any European Economic Area (EEA) country to operate throughout the European Union via branches, although tighter restrictions can be imposed on banks incorporated outside the EEA.

*...with some historical precedents and parallels in other industries...*

There are historical examples of regulators imposing restrictions on banks' business lines, notably the Glass-Steagall Act in the United States. Prior to its repeal in 1999, this legislation — crafted during the Great Depression — placed limits on the ability of retail banks to participate in investment banking activities and *vice versa*. Some US commentators have suggested the reintroduction of similar restrictions — for example, by limiting commercial banks' involvement in activities more suited to capital markets.<sup>(1)</sup> In the United Kingdom, restrictions on membership of the London Stock Exchange prior to the reforms of the 1980s had the effect of establishing a *de facto* boundary between the activities of commercial banks and securities firms active in regulated exchange-traded markets.

Business line restrictions are a common feature of regulatory arrangements in other industries that provide public services through a tightly connected network. One example is the energy sector, where licences for major network operators place limits on their activities. Utilities regulators typically complement business line restrictions with measures intended to improve firms' financial resilience and special arrangements for responding to problems that do occur (Box 7).

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(1) See, for example, the testimony of Paul Volcker (former chairman of the Federal Reserve) to the US House of Representatives' Committee on Banking and Financial Regulation in September 2009.

## Box 7

### Possible lessons from utilities industries

In common with banking, many utilities industries supply 'essential' services to the public. Many also involve networks through which problems could spread widely. Utilities regulators use a number of tools to address various market failures and promote continuity of service. This box looks at possible lessons for how banking regulation could address network risk and the too important to fail problem.<sup>(1)</sup>

#### Regulatory tools in utilities industries

Energy and water regulators use a range of tools including:

- **Financial resilience measures** can limit incentives for risk-taking and reduce the likelihood of financial distress. Provisions in the utility sector include requiring licence holders to meet requirements such as minimum credit ratings.
- **Special administration regimes** for utilities are designed to ensure that essential activities continue in the case of the operator being (or likely to be) unable to pay its debts, without the provisions of normal insolvency applying. The energy and water regulators have signalled that costs of financial distress arising from inappropriate actions of the operator should be borne by investors.
- **Ring-fencing** can be applied to both activities and financial structure. In the energy sector, for example, licences for major network operators place limits on their core activities. Activity by non-licensed (or non-exempt) operators is prohibited. Financial ring-fencing provisions in some water and energy operator licences seek to prevent cross-subsidy of non-regulated activities either by financial transfers from or risk transfers to regulated activities.

Reporting requirements support a number of these tools. For example, financial accounting requirements can support enforcement of ring-fences, and network reporting can help regulators assess the need for future investment.

**Table 1** Examples of regulatory tools used in different industries<sup>(a)</sup>

Sector (regulator)	Ring-fencing	Financial resilience measures	Special administration arrangements
Water and sewerage (Ofwat)	Financial	Minimum credit ratings	Priority is transfer
Energy networks (Ofgem) <sup>(b)</sup>	Activities and financial	Minimum credit ratings	Explicitly allows for 'rescue'
Banking (FSA)	Limited	Capital against risk exposures	Special Resolution Regime

Sources: Bank of England, Energy Act (2004), FSA, Ofgem, Ofwat and Water Industry Act (1991).

(a) This table shows examples and is not an exhaustive list.

(b) Examples shown for electricity distribution and transmission, and gas transportation.

These tools can work together to ensure successful private sector transfers of utility functions in the case of wider group financial distress. Such transfers include the YTL acquisition of Wessex Water, following the failure of the parent company (Enron) of Wessex's owner (Azurix) in 2002. Ring-fencing provisions enabled Wessex to be successfully extracted from the wider group and auctioned without use of special administration, government support or disruption to services.

#### Parallels with banking regulation

Some of the tools used in utility regulation have clear parallels in banking. Financial resilience measures such as capital and liquidity requirements are a key feature. Arrangements for resolving failure outside of normal insolvency regimes are relatively common. For example, the United Kingdom's Special Resolution Regime is designed to facilitate orderly resolution and continuity of key financial services.

Reporting is also a common theme of banking regulation — for example, banks are typically required to provide data on large exposures. Regulators need to ensure they have adequate information to understand risks to the system as well as risks to individual institutions. For example, timely and granular data on interconnections between banks could help to calibrate macroprudential instruments.

There are fewer parallels with ring-fencing in banking regulation. While there are some historical examples of activity restrictions, currently these are largely limited to the building society sector.

Experience in the utilities sector suggests that ring-fencing might be an area worth exploring in banking. In combination, appropriately designed financial resilience measures and ring-fencing could reduce the probability of financial distress. And in the event of distress, special administration and ring-fencing could help ensure continuity of service without eliminating potential losses for investors or protecting non-utility functions.

However, there are limitations in applying ring-fencing as used in utilities to banking. Network utilities are typically natural monopolies supplying services that may not be feasibly replicated outside the regulated sector. By contrast, the banking sector is more competitive and there could be a number of substitutes for 'utility' functions such as deposit-taking. As such, a key challenge in banking would be to prevent the potential disintermediation (regulatory arbitrage) from the utility bank sector to a 'shadow' sector. This challenge could be met by establishing and robustly policing a clear boundary between essential public services and other activities.

(1) The parallels between utilities and banking have been noted by a number of commentators, including John Kay — see for example Kay, J (2009), 'Narrow banking: the reform of banking regulation', Centre for the Study of Financial Innovation.



**Table 3.C** Stylised example of modularity in financial systems

A comparison of two alternative configurations of the financial system can usefully illustrate the relationship between diversification and systemic risk. In the first panel below, a single diversified bank invests in two assets (A and B), while in the second panel two banks invest only in asset A or asset B. In both cases banks hold 10% equity.

An idiosyncratic shock that results in a 20% drop in the value of asset A causes the diversified bank to fail. In the modular system, by contrast, only one bank is affected and the other can continue to provide financial services to the wider economy. Intuitively, the effect of diversification is to expose the equity backing asset B to shocks affecting asset A and vice versa.<sup>(a)</sup> The benefits of modularity are greatest where the likelihood of a common shock affecting returns on the two assets A and B is relatively low.

Diversified system							
Pre-shock				Post-shock			
Bank 1				Bank 1			
Assets	Liabilities			Assets	Liabilities		
A: 100	Equity: 16			A: 80	Equity: 0		
B: 60	Debt: 144			B: 60	Debt: 140		
Modular system							
Pre-shock				Post-shock			
Bank 1		Bank 2		Bank 1		Bank 2	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
A: 100	Equity: 10	B: 60	Equity: 6	A: 80	Equity: 0	B: 60	Equity: 6
	Debt: 90		Debt: 54		Debt: 80		Debt: 54

(a) This example is a numerical illustration of the general result that a portfolio of options is always at least as valuable as an option on the portfolio established by Merton, R (1973), 'Theory of rational option pricing', *The Bell Journal of Economics and Management Science*, Vol. 4(1), pages 141–83.

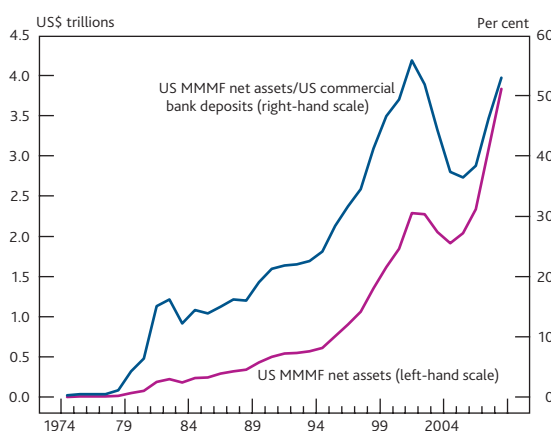
There are clear parallels between utilities and banking, in the sense that both provide essential public services. Equally, there are also some important differences — while utilities tend to be natural monopolies, banks face competition from alternative providers of financial services. Business line restrictions in banking may therefore be susceptible to disintermediation.<sup>(1)</sup>

#### ...and which could help reduce systemic risk.

Imposing restrictions on banks' activities could trigger fundamental changes in the structure of the financial system. Banks may become smaller and more specialised and the financial system, thereby, more diverse. By reducing the economic impact of financial distress at any one institution, expectations of government support would be reduced. A more modular financial system, with sufficient diversity across banks, may also be better able to absorb shocks without disruption to core financial services, as illustrated by the stylised example in Table 3.C.

#### Other measures would also be necessary to support business line restrictions.

Wherever the boundary is drawn, business line restrictions would need to be complemented by suitable regulatory and resolution arrangements for institutions on either side of the boundary. For banks providing utility services, a robust resolution regime would still be required to cater for unexpected problems and ensure continuity of key financial services. Suitable measures to prevent institutions outside the utility sector from becoming too important to fail would also be needed — for example, a capital structure that ensured losses automatically fell on investors, thereby reducing expectations of government support.<sup>(2)</sup>

**Chart 3.17** Size of US money market mutual funds' (MMMFs) total net assets relative to US commercial bank deposits, 1974–2008

Sources: Federal Reserve, Investment Company Institute and Bank calculations.

A pertinent example here might be the experience of US money market mutual funds (MMMFs), which have expanded rapidly over the past few decades (Chart 3.17). Most of these funds seek to maintain a constant net asset value (CNAV) and provide their customers with similar payment services as banks, despite being subject to substantially weaker regulatory requirements. As discussed in the June 2009 Report, the Bank believes that CNAV MMMFs (and other non-bank entities offering withdrawal at par and, effectively, on demand) should be required to convert into variable net asset value funds, so that losses are borne by investors, or be subject to the same regulatory standards as banks.

#### More investment in market infrastructure is needed...

Robust infrastructure can contribute significantly to altering the structure of the financial network and thereby improving

(1) For more discussion on the risk of disintermediation in finance, see Goodhart, C (2008), 'The boundary problem in financial regulation', *National Institute Economic Review*, Vol. 206, pages 48–55.

(2) A proposal along these lines, essentially requiring all financial intermediaries to be 100% equity funded, is put forward in Kotlikoff, L and Goodman, J (2009), *Back to basics*, New Republic, May.



its resilience. For example, expanding central clearing of financial instruments can help reduce network complexity by interposing a central counterparty (CCP) between the original counterparties to a trade.

Significant progress has been made in expanding the use of CCP clearing by major dealers in markets for standardised and liquid over-the-counter (OTC) instruments, such as interest rate swaps and credit default swaps. But there would be benefits in extending CCP clearing to other key OTC markets where concerns about counterparty risk contributed to contractions in liquidity during the crisis. This would include cross-currency interest rate swaps, forward rate agreements and longer-dated FX swaps, forwards and options. CCP clearing should also be expanded in markets where it is already available, such as equity derivatives and repo. Expanding direct access to CCP clearing services in these markets would help reduce network complexity, although the CCPs themselves would need to manage carefully any additional risks that might result.

*...including reducing barriers to central clearing...*

A critical practical question is how to introduce CCP clearing in markets where no such arrangements currently exist. There are a range of potential impediments to rapid progress in this area. Actual or prospective CCPs need to develop ways of managing risks from expanding clearing in new markets. And, given the perceived costs of higher collateralisation, market participants may prefer to retain bilateral clearing arrangements with their counterparties and clients.

It is important that the authorities provide the right incentives to use central clearing. Capital requirements on bilaterally cleared positions need to increase relative to those on CCP-cleared positions.

Bilateral clearing arrangements will continue to be necessary for markets that lack the requisite liquidity or standardisation to enable CCPs to clear them safely. The Bank welcomes current industry initiatives to enhance portfolio reconciliation, improve dispute resolution procedures, and strengthen collateralisation arrangements underpinning bilateral clearing.

*...although central counterparties' own risk management standards need to be strengthened...*

As central clearing expands, policymakers must ensure that CCPs have in place more robust arrangements than in the past for managing credit, liquidity and operational risks. Current global standards need to be strengthened to take account of advances in risk management and lessons learned over the past few years.

CCPs should be required to conduct high frequency stress tests of their margin models, default funds and treasury operations, allowing for both participant default and impaired market

liquidity. CCPs need adequate protection against the possible failure of their largest counterparties. The appropriate size of default funds should be reviewed. CCPs must be able to call intraday margin where market conditions warrant.

International standards should also require CCPs to restrict their investment policies so that they can access liquid funds in a timely way. In practice, this means that CCPs should concentrate their investments in highly liquid and creditworthy assets. And a CCP's payment arrangements need to minimise credit, liquidity and other risks.

A segregation of client accounts from house accounts (and ideally segregation between client accounts) would appropriately protect CCPs and facilitate post-default processes, including the transfer of client positions and collateral. It would also provide clearing members with incentives to collect appropriate margin from their clients.

*... which will require international co-ordination.*

Many central counterparties clear in a range of currencies, reflecting the reality of multi-currency trading in major financial centres and the netting benefits available across currencies. Requiring that a CCP clears only the currency of its own jurisdiction would significantly hinder systemic risk reduction. Any CCP clearing in the foreign exchange markets would, by definition, have to operate in a range of currencies. At the same time, national authorities have a legitimate interest in ensuring that a CCP clearing their currency of issue is suitably robust. For genuinely international infrastructures, the Bank believes that these interests are best met through effective co-operative oversight involving relevant national authorities, based on strengthened global standards.

#### Better crisis resolution arrangements should include:

- Pre-funded and risk-based deposit insurance to limit subsidies to riskier banks.
- The use of recovery and resolution plans (RRPs) to identify and reduce barriers to orderly resolution of financial institutions and to ensure losses can fall on unsecured wholesale creditors.
- Consideration of stronger arrangements to cater for the resolution of non-deposit taking institutions whose failure could undermine financial stability in some circumstances.
- Clear principles for public provision of capital support that ensure banks' shareholders and unsecured wholesale creditors bear losses.

### 3.3 Financial system resolution arrangements

No set of regulatory or structural policy measures would, or indeed should, prevent all bank failures. There is a need for robust arrangements to deal with failures when they occur. Effective resolution arrangements that ensure unsecured wholesale creditors incur losses improve market discipline by strengthening investor incentives to monitor banks' behaviour. This should reduce the accumulation of risks during the upswing of the financial cycle. And when failures do occur, robust resolution arrangements can mitigate network risks and wider economic disruption by helping to contain spillover effects.

*The scope of special resolution arrangements should be reviewed...*

The creation of the Special Resolution Regime in the United Kingdom under the Banking Act 2009 has enhanced the ability of the authorities to resolve deposit-taking institutions in a way that does not lead to systemic

disruption.<sup>(1)</sup> But disorderly failure of other types of institution could also cause material disruption. For example, the failure of Lehman Brothers — a non-deposit taking institution — in September 2008 led to a sharp reduction in the provision of credit and risk insurance in the United States and internationally. This episode has prompted legislative proposals in the United States to establish a special resolution regime for non-bank financial institutions.

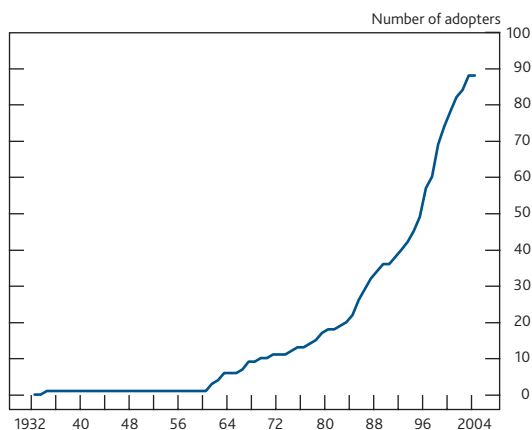
The tripartite authorities are currently exploring ways to improve resolution arrangements for UK investment firms, and HM Treasury has recently published a consultation document outlining a package of policy initiatives in this area.<sup>(2)</sup> A review of the scope of resolution arrangements should also cover the tools available to deal with bank holding companies. The Banking Act allows a bank holding company to be taken into temporary public ownership, if this is deemed necessary to resolve or reduce a serious threat to financial stability. But temporary public ownership is a tool which, by design, should be used only in extreme situations. Consideration should now be given to strengthening resolution arrangements for bank holding companies, and any non-deposit taking subsidiaries of those holding companies, whose failure could have systemic effects.

*...as should deposit insurance arrangements...*

A well-designed deposit insurance regime can help to facilitate orderly resolution by protecting the interests of retail depositors, preserving the integrity of the payments system and mitigating the network spillovers caused by retail depositor runs. The merits of deposit insurance are now widely accepted. Following a steep rise in adoption over the past two decades (**Chart 3.18**), deposit insurance schemes are now in place in nearly 100 countries. But there are variations in design, specifically in funding arrangements and the pricing of insurance premia (**Table 3.D**), which influence the effectiveness of deposit insurance regimes in mitigating the build-up of risks in the system.

The FSA intends to review the funding model for the Financial Services Compensation Scheme, which operates the depositor protection fund in the United Kingdom, in 2010.<sup>(3)</sup> As discussed in the June 2009 *Report*, the Bank believes that deposit insurance should be pre-funded through risk-based levies on banks. Box 8 outlines the benefits of pre-funding, discusses how risk-based premia could help to mitigate the distortion in deposit rates caused by deposit insurance, and suggests how risk-based levies could be set in practice.

**Chart 3.18** Number of deposit insurance schemes worldwide



Sources: World Bank and Bank calculations.

**Table 3.D** Comparison of selected deposit insurance schemes

	Pre-funded?	Risk-based premia?
Canada	✓	✓
Germany	✓	✓
Italy	✗	✓
Japan	✓	✗
Sweden	✓	✓
United Kingdom	✗	✗
United States	✓	✓

Sources: Canada Deposit Insurance Corporation, Deposit Insurance Corporation of Japan, European Commission and Financial Services Compensation Scheme.

(1) For further discussion, see Brierley, P (2009), 'The UK Special Resolution Regime for failing banks in an international context', *Bank of England Financial Stability Paper no. 5*, July.

(2) See HM Treasury (2009), 'Establishing resolution arrangements for investment banks'.

(3) See FSA (2009), 'Banking and compensation reform', *Policy Statement 09/11*.

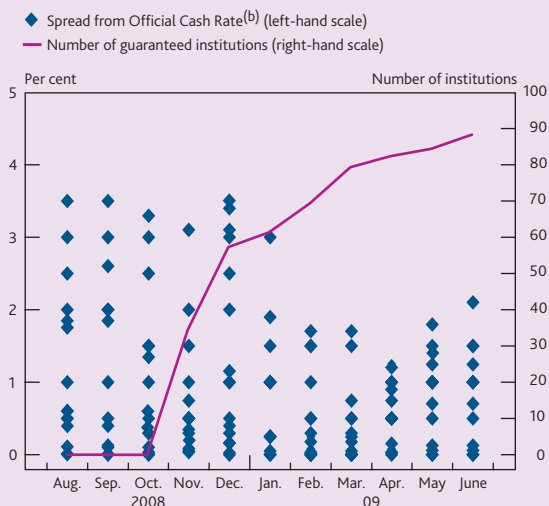
## Box 8 Pre-funded deposit insurance with risk-based levies

In the June 2009 *Report*, the Bank supported a pre-funded deposit insurance scheme with risk-adjusted levies. This box considers the case for such a scheme and discusses options for its design. The case for a risk-adjusted levy system is considered separately from the arguments for pre-funding, as it is possible to design schemes with one feature but not the other.<sup>(1)</sup>

### Case for risk-adjusted deposit insurance levies

Like any insurance contract, deposit insurance weakens depositors' incentives to monitor banks. It also causes a distortion in deposit rates by lowering risky banks' cost of obtaining retail deposits. An empirical study found that risk premia on retail deposits are over 40 basis points lower on average in countries with deposit insurance.<sup>(2)</sup> Without the need to pay risk premia, competitive pressures should cause deposit rates to converge, as occurred in New Zealand following the introduction of a deposit guarantee scheme in October 2008 (Chart A).<sup>(3)</sup>

**Chart A** Spread of six-month deposit rates from Official Cash Rate in New Zealand<sup>(a)</sup>



Sources: New Zealand Treasury, Reserve Bank of New Zealand, [www.interest.co.nz](http://www.interest.co.nz) and Bank calculations.

(a) Figures are for deposit accounts with minimum balance requirements of NZ\$5,000, other terms may vary.

(b) Spreads of commercial institutions' six-month term retail deposit rates from Official Cash Rate are for the first week of each month.

One way to correct for the effect of deposit insurance on risky banks' deposit funding costs is to impose risk-adjusted capital requirements on banks. These requirements would need to be calibrated to equalise across banks the impact their failure would have on the deposit insurer. But, in practice, perfect calibration would be very difficult to achieve. Moreover, the

principle for calibrating minimum microprudential capital standards is to set an upper bound on banks' probability of failure, rather than to equalise expected losses to the deposit insurer. Differences in banks' business models and risk appetites mean that there is a difference between their failure probabilities and expected losses to the deposit insurer.

### Case for pre-funded deposit insurance

There are three main arguments for a pre-funded deposit insurance scheme. First, building up a deposit insurance fund in advance of a crisis is likely to be less procyclical than a pay-as-you-go (PAYG) scheme that levies banks when their profitability is weak. For this reason, levies payable to the Financial Services Compensation Scheme (FSCS) are currently capped at £1 billion until March 2012. If a pre-fund sufficient to cover FSCS payouts during the current crisis had been accumulated over the ten years prior to the crisis and invested in risk-free assets returning 4%, annual levies would have averaged around 7% of the ten largest UK banks' aggregate profits over the period.

Second, a PAYG scheme is reliant on government support. The FSCS has borrowed around £21 billion from taxpayers during the present crisis, at a charge of Libor plus 30 basis points. A pre-funded scheme would avoid this borrowing cost. Third, importantly, a pre-funded scheme is more equitable because failed banks will have contributed to the cost of compensating their own depositors.

### Designing a risk-based, pre-funded scheme

The design of a pre-funded deposit insurance scheme with risk-adjusted levies can be classified as either top-down or bottom-up.

#### Bottom-up approach

The bottom-up approach attempts to charge banks levies equal to the risk they pose to the deposit insurer. It requires the deposit insurer to calculate individual banks' actual level of risk. No specific pre-fund size is targeted; instead the fund fluctuates naturally over time. Although some deposit insurers use such bottom-up approaches, they tend to use relatively simple methods to calculate risk, which are prone to significant measurement error.

The bottom-up approach is conceptually appealing. It is socially fair because in the long run payouts would be fully financed by levies on insured banks. On average, banks' contributions would equal the amount they draw from the fund when they fail. However, it is difficult to design an accurate bottom-up scheme. Methods to calculate individual banks' riskiness exist — for example, variations of the Merton (1974) model of credit risk.<sup>(4)</sup> But these methods rely on market data such as equity prices or CDS spreads, which are

unavailable for some banks and not always reliable measures of risk. Inaccurate measures of banks' level of risk could result in charging banks unfairly large or small levies.

### Top-down approach

Top-down schemes target a certain size of pre-fund, set according to an estimate of the deposit insurer's aggregate exposure to insured banks. Annual levies are calibrated so that the pre-fund will meet this target in a given time frame, with individual banks' levies varying according to their relative riskiness. The United States and Canada are among the countries that have this type of scheme.

An advantage of the top-down approach is that it may be easier to estimate the exposure of the deposit insurer to the banking sector as a whole rather than to individual banks. And there are established methods to measure banks' relative riskiness. A top-down scheme can also be administered using regulatory information that is readily available on all banks.

The top-down approach is not without difficulties. First, this crisis has shown that it is difficult to calculate an appropriate target fund size. In the United States, significant draws on the deposit insurance fund have required the deposit insurer to impose special levies to maintain the fund.<sup>(5)</sup> It is important that the target fund size is calculated on the basis of robust rules so that it is not vulnerable to lobbying pressures when the banking sector is performing well. This is likely to be important in a concentrated banking sector like the United Kingdom, where bank failures are infrequent. Second, to avoid the distortions in deposit pricing, the design of the top-down scheme will need to allow for risk-adjusted levies to be charged even when the fund approaches or reaches its target size. One possibility is to pay out dividends, distributed on the basis of past contributions to the fund, while simultaneously charging risk-adjusted levies.

### Other design issues

The approaches outlined above focus primarily on the probability of bank failures and the aggregate exposure of the deposit insurer. However, the risk a bank poses to the deposit insurer is also determined by the deposit insurer's loss given default (DLGD) when a bank fails. There are a number of factors that may cause DLGD to vary between banks — for example, it is likely to increase when a bank's funding structure means depositors are subordinate to the majority of other creditors. Using balance sheet data, it is possible to identify and assess a bank's DLGDs relative to other banks, though it is difficult to quantify the effect of each factor.

### Conclusion

This box sets out the case for risk-based, pre-funded deposit insurance, and identifies options for the design of such a

scheme. Further analysis is required to assess alternative design features.

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(1) For example, Italy has an *ex-post* funded scheme with risk-based levies and Japan has a pre-funded scheme with flat-rate levies (see Table 3.D).  
 (2) Batholdy, J, Boyle, G W and Stover, R D (2001), 'Deposit insurance and the risk premium in bank deposit rates', *Journal of Banking and Finance*, Vol. 27, pages 699–717.  
 (3) There was no deposit insurance in New Zealand prior to the introduction of the deposit guarantee scheme.  
 (4) Merton, R (1974), 'On the pricing of corporate debt: the risk structure of interest rates', *Journal of Finance*, Vol. 29, No. 2, pages 449–70.  
 (5) [www.fdic.gov/news/news/press/2009/pr09178.html](http://www.fdic.gov/news/news/press/2009/pr09178.html).

**Table 3.E Recommendations of the BCBS Cross-border Bank Resolution Group (CBRG)**

In September 2009, the BCBS CBRG published a report as part of an ongoing project stocktaking the legal and policy frameworks for cross-border crisis resolution. It makes ten recommendations:

- (i) **Effective national resolution powers** — National authorities should have tools to ensure orderly resolution of all types of financial institutions.
- (ii) **Frameworks for a co-ordinated resolution of financial groups** — Each jurisdiction to co-ordinate resolution of financial groups and conglomerates within its jurisdiction.
- (iii) **Convergence of national resolution measures** — Authorities to facilitate the co-ordinated resolution of cross-border financial institutions.
- (iv) **Cross-border effects of national resolution measures** — Authorities should consider procedures to facilitate mutual recognition of crisis resolution measures.
- (v) **Reduction of complexity and interconnectedness of group structures and operations** — Authorities to consider encouraging simplification where necessary for effective resolution.
- (vi) **Planning in advance for orderly resolution** — Systemic cross-border financial firms to promote resilience of key functions, and plan for recovery and rapid resolution.
- (vii) **Cross-border co-operation and information sharing** — Key authorities to agree arrangements for information sharing, for contingency planning and crisis management.
- (viii) **Strengthening risk mitigation mechanisms** — Authorities to promote the use of risk mitigation techniques that reduce systemic risk and enhance resilience during crisis or resolution.
- (ix) **Transfer of contractual relationships** — Allow resolution authorities to temporarily delay contractual termination clauses to complete a transfer in resolution.
- (x) **Exit strategies and market discipline** — Authorities to have clear options or principles for exit from public intervention.

Source: BIS.

**Table 3.F Resolution funds in selected European countries**

Feature	Spain	Sweden
Current size (% of GDP)	€9 billion (0.8)	€3.21 billion (1.0)
Flexibility (% of GDP)	Can be expanded to €90 billion (8.3)	Set to reach €7.7 billion (2.5)
Resolution powers	Capital injection, merger or total/partial transfer of business units	Capital injection (Tier 1) into ailing or sound institutions
Funding	Public (75%) and private (25%)	Public (45.5%) and private (54.5%)

Sources: Banco de España, IMF, Regeringskansliet and Bank calculations.

*...and financial firms should be required to prepare recovery and resolution plans.*

Financial firms' recovery and resolution plans (RRPs) can also help protect against threats to the smooth provision of financial services posed by network risks. Recovery plans aim to reduce the likelihood of a firm's failure, by ensuring the continuity of critical financial services under severely adverse conditions. Resolution plans aim to help ensure that, when firms do fail, they can be resolved in a way that protects financial stability, depositors and public funds. Effectively enforced, such plans might lead to some institutions changing the structure and legal complexity of their businesses. The FSA will establish rules on RRP, following the passage of the Financial Services Bill, a pilot exercise, and a consultation process.

RRPs could be a useful input to reducing impediments to effective cross-border resolution. The objective should be to avoid a situation in which tensions between national regimes (or uncertainty over how they would interact) make large cross-border banks too difficult to resolve. One option could be to promote greater convergence between national regimes, as recommended by the BCBS Cross-border Bank Resolution Group (Table 3.E) and as suggested more recently by the European Commission.<sup>(1)</sup>

*But government may still be required to provide rescue capital...*

Systemic financial crises have often resulted in government provision of capital to banks. An IMF study found that banks were recapitalised by the government in 33 out of 42 systemic crises over the period 1970–2007.<sup>(2)</sup> During the recent crisis, capital has been provided, or made available, by governments to banks in most countries of the European Union, in the United States and in Japan. Some European countries have recently established resolution funds, which effectively serve as sources of rescue capital (Table 3.F). A similar approach is under discussion by the US authorities.

Reform of regulation, structure and resolution arrangements should be designed to remove the need for such support by governments in the future. But no set of measures can remove entirely the risk that a systemic crisis will occur. One way to deal with this fundamental uncertainty is to set up clear principles for the role of the state as provider of rescue capital.

*...for which transparent principles and design features should be developed.*

Rescue capital should be provided only where necessary to prevent serious systemic disruption to key financial services,

(1) See BCBS (2009), 'Report and recommendations of the Cross-border Bank Resolution Group' and European Commission (2009), 'An EU framework for cross-border crisis management in the banking sector'.

(2) See Laeven, L and Valencia, F (2008), 'Systemic banking crisis: a new database', IMF Working Paper, WP/08/224.



and only if distressed banks' shareholders and unsecured wholesale creditors incur losses. One possible option could be to require that the principal value of banks' unsecured debt instruments was automatically written down on receipt of rescue capital — an approach broadly analogous to the role of contingent capital in absorbing losses for going-concern institutions.

Ensuring unsecured wholesale creditors knew that they stood to make losses in all states of the world would be the crucial design feature of any rescue capital scheme, and would sharpen these creditors' incentives to discipline bank management. Another important design feature would be the funding arrangements for rescue capital, as considered by HM Treasury in a recent discussion document.<sup>(1)</sup>

The recent crisis has made it clear that an overhaul of the financial system is required. But no single set of policy measures is likely to be a panacea. So it is important that tighter regulatory standards are complemented by structural reforms and improvements to resolution frameworks. That would deliver a policy framework that is more robust to future changes in behaviour.

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(1) See HM Treasury (2009), 'Risk, reward and responsibility: the financial sector and society'.