



OECD Economics Department Working Papers No. 717

**Financial Stability
in the United Kingdom:
Banking on Prudence**

E. Philip Davis

<https://dx.doi.org/10.1787/222702735047>

Unclassified

ECO/WKP(2009)57

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development

17-Jul-2009

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2009)57
Unclassified

FINANCIAL STABILITY: BANKING ON PRUDENCE

ECONOMICS DEPARTMENT WORKING PAPER No. 716

By Professor E. Philip Davis

JT03268045

Document complet disponible sur OLIS dans son format d'origine
Complete document available on OLIS in its original format

English - Or. English

ABSTRACT/RÉSUMÉ

Financial Stability in the United Kingdom: Banking on Prudence

The UK financial market has been severely affected by the recent financial crisis. The crisis has exposed weaknesses in the supervisory framework as well as that for crisis management and resolution. This paper reviews the supervisory and regulatory framework and the many reforms that have already been adopted to remedy these weaknesses. It also provides recommendations for further reforms. This Working Paper relates to the 2009 Economic Survey of the United Kingdom.([www.oecd.org/eco/surveys/United Kingdom](http://www.oecd.org/eco/surveys/United%20Kingdom)).

JEL classification: G18, G21.

Keywords: Financial stability; financial regulation; UK banking system; macroprudential issues.

Stabilité financière au Royaume-Uni : miser sur la prudence

Le marché financier britannique a été sévèrement touché par la crise financière. Celle-ci a mis en évidence de nombreuses faiblesses des mécanismes de contrôle et des dispositifs de gestion et de résolution des crises. Le présent chapitre examine le cadre de contrôle et de réglementation, ainsi que les nombreuses réformes qui ont déjà été adoptées pour remédier à ses faiblesses. Il s'achève par des recommandations concernant de nouvelles réformes. Ce document de travail se rapporte à *l'Étude économique de l'OCDE de le Royaume-Uni 2009* (www.oecd.org/eco/etudes/Royaume-Uni)

Classification JEL : G18, G21.

Mots clés : Stabilité financière ; réglementation financière ; système bancaire du Royaume-Uni ; questions macroprudentielles.

Copyright OECD 2009

**Application for permission to reproduce or translate all, or part of, this material should be made to:
Head of Publications Service, OECD, 2 rue André-Pascal, 75775 Paris Cedex 16, France.**

TABLE OF CONTENTS

Financial stability: banking on prudence	5
Some background on banking sector developments	5
Banking regulation	8
Why regulate banks?.....	8
The UK regulatory framework	9
Bank regulation	10
Capital adequacy standards.....	10
Liquidity and bank funding	12
Lending standards and “subprime” lending.....	15
Remuneration.....	15
Supervision.....	16
Lessons for supervision from the Northern Rock failure.....	16
Policies for crisis management and resolution	17
Systemic risk and macroprudential regulation	18
Understanding of the risks in the credit cycle.....	19
Stress testing	20
Regulation and pro-cyclicality	20
Strengthening banking regulation and supporting financial stability	21
Bibliography	24

Tables

1. UK banking sector overview	6
2. Financial soundness indicators for UK banks	7

Figures

1. Major UK banks’ customer funding gap and foreign interbank deposits.....	7
2. Share price indices.....	8

Boxes

Box 1. The 2006 tripartite agreement.....	9
Box 2. Recommendations on banking regulation and financial stability	22

FINANCIAL STABILITY IN THE UNITED KINGDOM: BANKING ON PRUDENCE

By E. Philip Davis¹

1. A well-functioning financial market is essential for sustaining economic growth, both to support activity in the short term and to allocate resources to investment for the longer term (de Serres *et al.*, 2006). The UK financial market is highly developed, dynamic and internationally open. It is an important sector of the UK economy and the City of London is a major international financial centre. Sound regulation and supervision are important in ensuring that financial market institutions, particularly banks, function well and that financial stability is sustained. The regulatory approach developed by the UK authorities has been well-regarded (IMF, 2003) and a number of countries have followed the model of a single supervisor for all financial firms.

2. UK markets and institutions were deeply involved in the prolonged global credit and asset-price cycle that has developed into a financial crisis with severe effects on the real economy. The house-price boom was very pronounced and UK banks made heavy losses from purchases of asset-backed securities. Since liquidity and funding pressures led to a bank run at Northern Rock, there have been many policy measures to ease stress in financial markets, and a number of major banks have been brought into different forms of public ownership or required recapitalisation. This paper considers the system of financial regulation and supervision, focusing especially on banks, in the light of recent developments and current reforms. Recent experience points to a range of problems in terms of capital adequacy standards, liquidity and funding arrangements, supervision, crisis management and resolution, and macroprudential regulation. In some areas, reforms have already been made or are under discussion. But more work is required, once the immediate problems have been addressed, to ensure that banking regulation and supervision are adequate.

Some background on banking sector developments

3. The UK banking sector is large, internationally open and highly developed. Total banking assets are over five times GDP, a much higher multiple than in the euro area, even though bank finance is relatively more important there, and a much higher multiple than in the United States (Table 1, Panel A). Around 500 000 people are employed in banking with over 1 million in the wider financial sector. The City of London, a major international financial centre, accounts for a large share of global banking activity. Around two-thirds of overall bank assets and liabilities are denominated in foreign currency, much of it not closely connected to domestic non-financial activity. Only around 20% of banking establishments are UK-owned, although many of the foreign-owned banks are small. UK-owned banks account for around 40% of overall banking assets and around 60% of sterling assets, which are most closely related to

1. Professor E. Philip Davis is Head of Economics and Finance, at the School of Social Sciences, Brunel University. The paper was originally produced for the 2009 OECD *Economic Survey of the United Kingdom*, published in June 2009 under the authority of the Economic and Development Review Committee of the OECD. I would like to thank, without implicating, Andrew Dean, Robert Ford, Peter Hoeller and Petar Vujanovic for helpful comments. I am also grateful to Joseph Chien for technical assistance and Deirdre Claassen for secretarial assistance.

the domestic economy (Table 1, Panel B). The foreign-currency assets and liabilities of UK-owned banks are nevertheless still substantial by comparison with GDP. While the overall concentration of the UK banking system is not especially high, the market concentration of lending and deposits of UK households and companies is considerable, with 63% accounted for by the top 5 banks prior to 2008 (Bank of England, 2008b).

4. Many factors have contributed to the development of the financial and banking system in its current form. The prominence of London's international capital markets began in the 1960s. Restrictions on the banking system were eased substantially during the 1970s and quantitative controls largely disappeared with the abolition of the "corset" arrangement on bank balance-sheet growth in 1980. UK banks began to enter investment banking after the 1986 "Big Bang" deregulation of the equity markets. Building societies, mutually-owned savings banks that specialised in residential mortgages, were allowed to demutualise in 1986 and many became banks, undertaking a wider range of activities.

Table 1. UK banking sector overview

Panel A. Resident banking-sector assets (multiples of GDP)

Country	2007	2008
UK	5.0	5.5
Euro area	3.3	3.5
US	0.9	1.0

Panel B. UK resident banking-sector assets by currency (multiples of GDP)

Bank ownership	£ assets	Foreign currency assets	Total assets
UK	1.40	1.05	2.45
Other European Union	0.47	1.05	1.51
American	0.08	0.44	0.52
Japanese	0.01	0.11	0.12
Other developed	0.16	0.65	0.81
Other	0.01	0.05	0.06
Memo: building societies	0.26	0.02	0.27

Source: Bank of England.

5. Since the recession of the early 1990s, the UK banking sector enjoyed a prolonged period of expansion and profitability with apparently good credit quality. Indicators of financial soundness were favourable over the boom period, perhaps giving banks and regulators a false sense of security (Table 2). An important development during this period was the globally widespread shift towards securitisation of loans. This allowed banks to collect substantial front-end fees for arranging and structuring portfolios of mortgages, without carrying the credit risk on their balance sheet or needing to fund the extension of credit directly. At the same time, banks held large volumes of other banks' structured products on their balance sheets. More generally, the banking sector rapidly increased its lending to the UK corporate and, especially, household sector, fuelling increases in house prices, while also purchasing assets and extending more loans abroad.

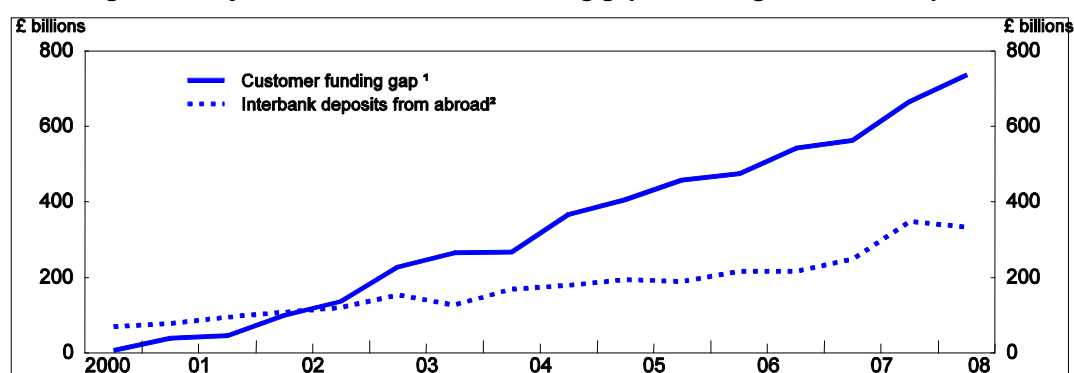
Table 2. Financial soundness indicators for UK banks

	2003	2004	2005	2006	2007	2008 ¹
Major banks tier 1 capital ratios – median	8.1	8.0	7.9	8.0	7.7	7.9
Bank capital to assets – median	26.7	26.6	30.4	30.8	31.2	34.1
Bank non-performing loans to total loans	2.5	1.9	1.0	0.9	0.9	
Bank provisions to non-performing loans	69.8	61.5	54.0	54.6		
Bank return on assets	0.6	0.7	0.8	0.5	0.4	
Bank return on equity	8.6	10.9	11.8	8.9	6.2	

1. June 2008.

Source: IMF (2008) and Bank of England.

6. The increasing dependence of banks on wholesale funding from financial markets (other banks, money market funds, corporate treasuries and other non-bank investors), rather than deposits, was another major development. Major UK-owned banks' "customer funding gap", which indicates net dependence on wholesale funding, rose on the Bank of England's definition from zero in 2001 to £738 billion in 2008 (around 50% of GDP), of which £333 billion was accounted for by net interbank deposits from abroad. The presence of the international banking market in the City of London may have facilitated such borrowing by domestic institutions.

Figure 1. Major UK banks' customer funding gap and foreign interbank deposits

1. Customer funding gap is customer lending less customer funding, where customer refers to all non-bank borrowers and depositors.

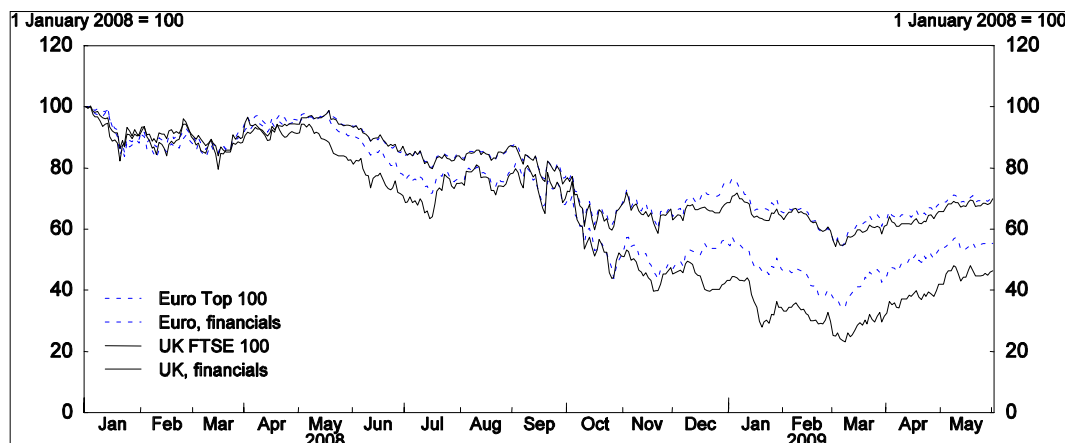
2. Data exclude Nationwide.

Source: Bank of England.

7. The turning of the credit cycle had a severe impact on the UK banking system. Interbank markets have been stressed since August 2007 and almost froze up in autumn 2008, Northern Rock bank faced a customer deposit run, additional measures were implemented to provide liquidity to financial institutions, a number of banks were recapitalised and one bank nationalised. In international comparison, UK-owned banks have been among those most severely affected to date and their share prices have fallen more sharply than the European average, when adjusting for currency movements (Figure 2). Initial estimates suggested that large UK-owned banks were heavily represented among institutions making very large write downs from exposures to asset-backed securities, proportionately more so than euro area or Japanese banks (The Banker, 2008). Losses for major UK-owned banks were estimated by the Bank of England in October 2008 at £36 billion. Most of these losses were due to US assets, notably asset-based securities linked to the US sub-prime market. With their relatively heavy reliance on wholesale funding, UK banks were more exposed to the difficult conditions in interbank and other wholesale markets and the lack of demand for securitised loans. However, despite UK banks' prior dependence on cross-border funding and

on foreign buyers for securitised debt, the link of the crisis to the role of London as a global financial centre should not be exaggerated. Earlier analysis suggested a degree of insulation between the domestic and international banking sectors because many wholesale market transactions are between branches of foreign-owned institutions (IMF, 2003).

Figure 2. Share price indices¹



1. All series are denominated in UK £.

Source: Datastream.

Banking regulation

Why regulate banks?

8. The need for banking regulation arises from the existence of asymmetric information between lenders and borrowers. Uncertainty about the returns to projects for loans that have been advanced can lead to instability in the financial system, which once set in motion, cannot easily be overcome by private markets alone. In addition, information asymmetries between the authorities and lenders create moral hazard for institutions that are “too big to fail” given the impact they have on the wider economy. Regulation is one way of addressing these problems. There are three central objectives of regulation and supervision (OECD, 2007):

- Prevention of systemic risk: maintaining the stability of, and confidence in, the financial system.
- Consumer/investor protection: protecting investors and borrowers from excessive risk of loss or financial harm arising from failure, fraud, manipulation or other forms of misconduct.
- Conduct of business: ensuring effective, efficient and reliable functioning of financial markets with the proper working of competitive forces.

9. A key aspect underlying the need for banking regulation arises from the mismatch between short-term funding of banks and the long-term nature of many bank loans such as retail mortgages. In traditional banking, a large share of short-term liabilities took the form of deposits callable on sight or with short terms. This maturity mismatch makes banks fragile as they can normally operate with low levels of liquid assets (cash, short-term government bonds) to invest in higher yielding illiquid assets, while providing “liquidity insurance” to depositors (Diamond and Dybvig, 1983).

10. There is, however, a risk that an unexpectedly large number of depositors will seek to withdraw their deposits at the same time and there may be “runs” if agents decide to withdraw their deposits in anticipation of a critical mass of other depositors doing the same. This liquidity problem can lead to insolvency if the bank needs to sell its illiquid assets rapidly and cannot obtain the full value but rather receives “fire sale” prices. The more modern model of banking, applicable to the large domestic UK banks, has greater reliance on funding from wholesale money and bond markets than smaller banks. Although such funds may be provided by well-informed investors in generally well-functioning capital markets, market funding has in the current crisis proved subject to runs just like retail deposits, and the difficulties in the interbank market since August 2007 illustrate the risks of a wider absence of liquidity for banks that need to finance long-term assets. There are important externalities between institutions due to actual or perceived interlinkages that imply that “runs” may spread between institutions. Banks have only a relatively small amount of their own equity capital and liquid assets in relation to their overall liabilities. There is therefore an inherent risk of insolvency if a bank’s loans are not repaid or if assets have lower returns than anticipated.

The UK regulatory framework

11. The UK financial system is an integral part of the EU single market in financial services. European single-market legislation provides much of the basic framework for regulation, which itself often follows international agreements (OECD, 2009). Individual countries nevertheless retain substantial discretion on how this framework is transposed into national requirements. Bank supervision remains a national responsibility with the national authorities having the primary responsibility in most areas for institutions incorporated in their jurisdiction, but with much less control over the activities of branches of banks based in other EU countries, which may enter the domestic market using the EU banking passport system. Recent initiatives at the EU level aim to improve coordination between the different regulators of large complex cross-border financial institutions by creating colleges of the different national supervisors involved with an institution. These proposals envisage a coordinating role given for the “lead supervisor”, the supervisor that has the responsibility for the consolidated banking group within the colleges.

12. The UK has relied on a tripartite framework for financial stability: the Financial Services Authority (FSA) is responsible for financial and banking regulation; the Bank of England contributes to the stability of the system through monetary policy, its lender of last resort operations and macroprudential surveillance; and the Treasury is responsible for the overall architecture of the system and aspects affecting the public finances (Box 1). The recent crisis has intensified the cooperation between these institutions as all have been required to work together when dealing with failing banks, the recapitalisation of the banking system and other measures to support the supply of credit. As discussed below, significant changes to the Bank of England’s role in financial surveillance are envisaged in the Banking Act 2009.

Box 1. The 2006 tripartite agreement

The Memorandum of Understanding (HM Treasury, 2006) seeks to define clearly the responsibilities of the FSA, the Bank of England and the Treasury based on four guiding principles: clear accountability, transparency, the avoidance of duplication and regular information exchange.

The Bank of England has as a core purpose the maintenance of the stability of the financial system as a whole. This involves the setting of monetary policy and the use of regular market operations to deal with fluctuations in liquidity. The Bank has a lender of last resort function in the case where a problem with an individual institution has a systemic impact on other parts of the financial system. In addition, the Bank has responsibility for oversight of systemically important payment systems and financial infrastructure. The Bank has a wider responsibility for the stability of the financial system, advising on the implications for UK financial stability of developments in the domestic and international markets. The Deputy Governor of the Bank sits on the board of the FSA.

The FSA’s powers and responsibilities are set out in the Financial Services and Markets Act 2000. It authorises and supervises: banks, building societies, investment firms, insurance companies and brokers, as well as securities

listings and clearing and settlement systems. The FSA sets capital or other regulatory requirements. It also has a crisis management role. For a troubled bank it can facilitate a market solution involving, for example, the injection of new capital by one or more third parties. The FSA also has an advisory role in terms of international and European policy initiatives in the area of regulation.

The Treasury shapes the overall institutional structure of financial regulation and the legislation which governs it, including the negotiation of EU directives. Moreover, it is responsible to Parliament for the management of serious problems in the financial system and any measures used to resolve them, including any Treasury decision concerning exceptional official operations. It also has a role with respect to the public finances and public debt management. The Treasury has no operational responsibility for the activities of the FSA and the Bank but it is expected to be closely involved with many aspects of regulation and crisis management.

The Memorandum of Understanding sets out responsibility with respect to information gathering and the need for free information exchange between the FSA and the Bank, the establishment of a tripartite Standing Committee meeting on a monthly basis at deputies (official) level to discuss individual cases of significance and other developments relevant to financial stability with the possibility to meet at principals level (Chancellor/Governor/Chairman) in exceptional circumstances.

Bank regulation

13. The regulation of banks is aimed at achieving stability, both of individual institutions and the system as a whole, and has a number of aspects. Capital adequacy standards influence the overall amount of risk that is taken through the amount of capital held to cover unexpected losses, as well as giving equity holders an incentive to monitor the amount of risk-taking. Restrictions on liquidity and funding practices seek to ensure that institutions have sufficient liquid assets on hand to meet short-term liabilities. Deposit insurance is an important instrument to maintain the stability of banks by reducing the incentive for bank runs. There is a range of other areas of prudential regulation and supervision, such as regulatory oversight of risk management practices. Regulation must be carefully designed to strike a balance between stability and growth, as well as ensuring that possibilities for regulatory arbitrage are minimised (Wehinger, 2008).

Capital adequacy standards

14. The framework for the capital adequacy standards for UK banks up to the end of 2006 was based on the Basel 1 standards (including the 1988 Capital Accord). These were applied in the United Kingdom through the transposition of the relevant EU directives, which followed the principle of minimum harmonisation, thereby allowing national authorities to impose higher standards over a wide range of areas as necessary. Banks were required to hold a minimum of 8% of capital against risk-weighted assets, where risk weightings were defined in terms of broad categories or “buckets” of assets.² In 1996, the Basel framework was supplemented by provisions for the regulation of market risk in trading books. This system had a number of shortcomings: the risk classes were crude;³ and there was an incentive to maximise risk within the classes. In many countries, the 8% risk-based capital ratio became a target and not a minimum. The UK authorities, however, avoided this practice by setting “individual capital guidance”, a minimum level of capital below which supervisors would engage in enhanced intervention. Minimum capital for individual institutions was effectively set at levels often well in excess of 8%, based on detailed analysis of the risks by the supervisor, and banks usually held capital somewhat in excess of the “trigger” levels. Although differences in accounting standards make international comparisons difficult, the available evidence suggests that prior to the crisis UK banks appeared to be well capitalised (in terms of Pillar 1) and had, on average, capital-adequacy ratios that were above the European average.

2. Capital includes both shareholders’ equity (Tier 1) and other quasi equity instruments including subordinated debt (Tier 2).

3. For example, there was a 100% risk-weighting on all non-financial companies, regardless of credit quality.

15. The effectiveness of these regulatory capital ratios was, however, weakened as banks used off balance sheet vehicles to hold securitised assets. These assets had a relatively low impact on the calculation of capital adequacy. As a result, risks to banks' capital were understated, as these vehicles often had claims on banks due to credit risks or back-up liquidity lines. Some EU countries (Denmark, the Netherlands and Spain) required separate capitalisation of subsidiary special investment vehicles (SIVs) and conduits, which effectively removed this problem. Off-balance sheet vehicles also reduce the transparency of a bank's financial position and, although aware of the exposure of individual UK banks, the FSA was surprised by the scope and size of the overall market for SIVs when the crisis began. The International Accounting Standards Board (IASB) is currently looking at ways to improve consolidation of SIVs in financial statements. However, regulatory treatment of SIVs should be tightened in terms of how capital requirements are set and allowance made for counterparty credit risk, as well as other risks arising from SIVs and any other near-bank subsidiaries that may be devised in the future.

16. Capital adequacy regulation since 2007 has been based on the Basel 2 approach, updating the earlier arrangements and applying the EU Capital Requirements Directive. There is a standardised approach for small banks based on risk weightings but with more differentiated categories than in the past and with risk ratings generated by credit rating agencies. More complex banks – such as major UK banks – can use internal risk models as a basis for allocating capital. Under the “foundation” approach, the bank estimates the probability of default and supervisors supply other inputs, whereas under the “advanced” approach banks run models using their own parameters and thereby have complete control of the factors determining their capital allocation. The introduction of Basel 2 has also better integrated other developments in financial markets, including the quality of collateral, guarantees, credit derivatives, netting and securitisation. For UK banks, the implementation of the new framework did not on average lead to a reduction in the amount of capital held for regulatory purposes, although for some institutions the adoption of the “advanced” approach did lead to a reduction. The reliance on both credit rating agencies and internal models for risk assessment may be a weakness in the new framework given the problems revealed by the subprime crisis about rating agency assessments and the short sample of data available for risk modelling. Overoptimistic assumptions on correlations and credit risk, for example, may have been used by rating agencies in the assessment of collateralised debt obligations with an indirect effect on banking institutions holding such assets and the amount of regulatory capital they were required to hold.⁴ Although there is a case for excluding ratings from the Basel 2 process entirely (Brunnermeier *et al.*, 2009), at least for securitisation products, bankers and regulators should at a minimum use considerable caution in the use of ratings in the future and they should not be used mechanically as a substitute for their own analysis.

17. The increasing complexity of commercial banks as they have moved away from traditional activities has made banking regulation and supervision more challenging. Given that it is harder for regulators to monitor how a more complex institution is operating, regulation has shifted to emphasise internal risk management procedures. UK regulators were particularly advanced in the shift from rules-based to principles-based or process-oriented regulation. It is also an important part of Basel 2's three-pillar framework of capital adequacy, supervisory oversight and market discipline. In this approach, supervisors are less involved in setting rules for determining capital adequacy and focus instead on ensuring that internal risk management procedures are adequate. The FSA has been active in the application of the ‘Pillar 2’ individual assessment of a bank's own capital position and requiring ‘capital add-ons’ where the ‘Pillar 1’ capital requirements are judged insufficient. The initial ‘Pillar 2’ approach is described in FSA (2007c) and has continued to evolve. Market discipline was also expected to play an enhanced role through greater disclosure (‘Pillar 3’).

4. The rating agencies appear to have assumed that US-wide falls in house prices are extremely unlikely, which gave a false view of the overall risk of the instruments.

Market risk and the secondary banking market

18. As major banks have moved away from traditional banking activities, market risk has become more important to the stability of the banking system. This trend has been reinforced by the financial and regulatory developments that extended the use of securitisation and holding of securitised loans on banks' balance sheets. The greater reliance on marketable assets, rather than loans, has extended the use of mark-to-market accounting, where the value of assets is frequently reassessed using financial data. In principle, this approach increases transparency by making it harder for firms to conceal losses. It may, however, lead to problems if market prices create misleading signals. In the upswing, market prices are likely to have understated the risk of many assets. Since the turmoil began, mark-to-market losses on securitised structured products were to a considerable extent a reflection of liquidity risk as well as credit risk, with the former estimated to have accounted for around 40% of mark-to-market losses on structured products (Bank of England, 2008b). There is concern that the use of credit default swap (CDS) prices to aid in asset valuation may have contributed to a downward spiral in asset prices because the loss of liquidity lowered prices for a given expected level of default. Furthermore, the "fire sale" problem, namely that banks facing pressure on liquidity find it hard to realise the full value for assets, is arguably exacerbated by marking to market. However, given that historic cost accounting has significant problems also, marking to market remains appropriate for the trading book but it will be important to use recent experience about the behaviour of valuations in guiding how regulators and markets use this information in the future.

*Liquidity and bank funding**Liquidity regulation*

19. Liquidity regulation is less extensively covered than capital adequacy in both international and EU frameworks. The UK authorities' approach places significant emphasis on firms being expected to survive liquidity stresses through the market funding rather than central bank funding. The current liquidity regime for large UK banks contains both a qualitative and a quantitative component. The qualitative elements require there to be adequate systems and controls with adequate liquidity, stress tests and contingency plans. These are based on the Basel Committee on Banking Supervision's 2000 *Sound Practices for Managing Liquidity in Banking Organisations*. In addition to these requirements, large UK banks are required to meet the Sterling Stock regime. This policy is designed to ensure a bank has sufficient liquidity for the first week of a liquidity crisis without recourse to wholesale funding and assuming an outflow of retail deposits. The regime requires banks to hold government bonds and central bank reserves and not assume central bank eligibility. The holdings of this narrow set of liquid assets have declined as a share of total asset holdings for the UK banking sector over a long period from the 1970s to 1% in 2008, according to a measure by the Bank of England.⁵ However, the more internationally comparable ratio of liquid assets to total funding for the large UK banks is on average 12%. Like other quantitative liquidity regimes, the Sterling Stock regime displayed a number of weaknesses during the current crisis. The current regulations do not take into account foreign currency and off balance sheet liabilities. As an immediate response to the crisis, the authorities introduced stringent new reporting requirements and stress tests of liquidity: these must now include an assessment of how a bank would cope if there were no more liquidity available over a "prolonged" period consistent with recent experience.

5. Broad liquidity is defined to comprise cash, Bank of England balances, money at call, eligible bills and gilts. The Bank of England's preferred measure is for sterling liquidity as a proportion of total assets. An alternative measure capturing total liquidity as a proportion of total assets is somewhat higher at around 4%.

20. The FSA has been consulting since December 2008 on a new liquidity regime, which would be more closely linked to the funding needs of each bank and based on more severe assumptions about the stickiness and the chronic nature of liquidity shortages (FSA, 2007b and 2008b). The UK authorities are active members of the appropriate EU and international fora and have publicly stated their desire for a global and European liquidity standard. At the same time, the FSA has been clear that it will have to proceed with the required overhaul of its domestic liquidity regime in the absence of international consensus. The proposals emphasise the responsibility of banks' senior management to adopt sound approaches to liquidity risk management. There are six main elements to the planned changes. First, all regulated entities must have adequate liquidity and must not depend on other parts of their group to survive liquidity stresses, unless permitted to do so by the FSA. Second, there will be a new systems and controls framework based on the recent work by the Basel Committee on Banking Supervision (BCBS) and the Committee of European Banking Supervisors (CEBS). Third, there will be a system of quantitative individual liquidity adequacy standards (ILAS) for each institution based on a firm being able to survive liquidity stresses of varying magnitude and duration. Fourth, a new framework for group-wide and cross-border management of liquidity is to be introduced allowing firms, through waivers and modifications, to deviate from self-sufficiency where this is appropriate and would not result in undue risk to clients. Fifth, a new reporting framework for liquidity is introduced, with the FSA collecting detailed, standardised liquidity data at an appropriate frequency so the FSA can monitor both firm-specific and market-wide developments in terms of liquidity-risk exposures.⁶ Sixth, the proposal includes a significant increase in banks' buffer of liquid assets. The FSA would require banks to hold 6–10% of assets in government bonds compared with an average of 5% for the ten largest banks at present. The FSA calculates that this imply that banks could switch £87 to £350 billion of their assets into government bonds. The regulator's calculations assumed the shift would cost banks 150 basis points a year in lost revenues, because the government bonds they will be forced to hold will have lower yields than their current fixed-income instruments.⁷ Internationally, US commercial banks hold 13% of their assets in US Treasury and Agency securities, while euro area banks hold only around 6% in government securities. The new liquidity proposals would be a marked advance, in particular on the previous, one-size-fits-all quantitative approach to liquidity regulation. These measures would also help to address moral hazard issues resulting from the provision of liquidity during the financial turmoil. The buffer is likely to be particularly important and should aim to raise the proportion of liquid assets held by UK banks. It will be important to ensure that regulatory arbitrage is contained if UK regulations were to be comparatively tight.

Deposit insurance

21. Deposit insurance systems are designed to protect against financial instability by preventing "runs" on banks. However, especially because the insurance is typically not priced according to risk, it also gives rise to moral hazard, with incentives for protected banks to take greater risks (Schich, 2008). Up to 2007, the ceiling of insured deposits was £35 000 with co-insurance: the first £2000 was fully covered and the remainder at 90%. The idea was to provide an incentive for depositors to monitor banks to avoid losing money, thereby reducing moral hazard.

22. The Northern Rock episode showed that this scheme was insufficient to prevent bank runs and the co-insurance element was removed in October 2007. As financial market tensions intensified in October 2008, the ceiling was raised to £50 000, which is just above the minimum under new European agreements. This raised the coverage under the pre-2007 arrangements from 96% of eligible retail

6. Apart from reports on systems and controls, all items will be reported at least monthly and in most cases weekly or daily (FSA, 2008b Annex 5).

7. Targets for holdings of government bonds will be phased in gradually to avoid destabilising markets. Banks will be allowed to hold US and European government bonds, as well as UK gilts, depending on the distribution of their assets.

accounts and 50% of the value of deposits to 98% of accounts and 60% of the value of deposits at present. To avoid runs, it is important that expected deposit insurance payouts should be rapid and predictable. Confusion and possible delay in receiving funds were problems in the case of Northern Rock and the authorities are now planning to introduce a target to pay out within 7 days after closure, as soon as changes to bank systems can be made (target of end 2010). This is closer to the practice in countries such as the United States where the scheme pays almost immediately. The Banking Special Provision Act 2008 (BSPA) and the special resolution regime (SRR) in the UK has also enabled several rapid deposit transfers (*e.g.* Bradford & Bingley, Dunfermline Building Society).

23. There is also a need for improved consumer information on the deposit insurance system. Consumers, for example, are unlikely to understand that coverage is per depositor per authorised entity and may not realise that they are only insured once for multiple accounts held with a single entity even if that firm trades under multiple brands. A smooth functioning deposit insurance system can also help winding up failing institutions by ensuring that retail depositors are protected in all eventualities. This aspect appeared to work well with the nationalisation of Bradford and Bingley, where funding provided through the Financial Services Compensation Scheme (FSCS) was an important part of achieving a smooth transition to a new form of ownership. There are also important challenges arising from the presence of cross-border banking operations; the failure of three Icelandic banks in October 2008 left many UK households and institutions exposed but Iceland appeared unable to reimburse these depositors and the UK government financed repayment of retail deposits.

24. Deposit insurance is one of the functions of the FSCS, which also has responsibility as the statutory compensation fund for defaults by other financial firms, such as investment firms (including paying compensation for cases of mis-selling and bad advice where the independent Financial Ombudsman Service has determined that compensation is payable). The FSCS is operationally independent of the Treasury and the FSA. Funding remains on the basis of “what could be reasonably expected within a year” and hence the fund has been very modest. The supplementary government funding provided during the last half of 2008 in respect of Bradford & Bingley, the Icelandic banks and London Scottish Bank has meant that the FSCS has accrued substantial loans which were used to fund resolution of those defaults and which will need to be repaid. Since February 2009, under the Banking Act, the FSCS is now able to borrow from the government’s National Loans Fund to provide payouts in the short run and can continue to raise *ex post* levies on the banks to cover the costs it has incurred. However, pre-funding towards a Treasury-determined target level is possible under new legislation (HM Treasury, 2008c). Although existing claims on the fund and the current situation in the banking system preclude a swift transition to a new system of pre-funding, such a reform might add to the credibility of the deposit insurance regime and avoid the pro-cyclical features of the current system by building up funds during booms rather than charging levies in a downturn. Consideration should be given to a system of risk-based insurance premia as used in other OECD countries (Canada, Finland, France, Italy, Portugal, Sweden, and United States), which would more closely align risks being taken by institutions and thereby reduce the probability that it may need deposit insurance. There is a risk that this differentiated system would stigmatise banks that are already in difficulty, although there is little evidence of such destabilising effects in systems where this approach has been taken.

Funding and securitisation

25. UK banks were heavily dependent on securitisation to sustain the flow of lending that was being made through their operations: securitisation amounted to 25% of new mortgages in 2007. This proved a structural weakness as much of the funding for securitisations came from other banks or from overseas. The subprime crisis in the United States hit the demand for UK securitisations directly. Suspicions arose about the real level of risk of highly-rated securities as a result of the high rate of default on the loans underlying US sub-prime collateralised debt obligations (CDOs). This led to a “buyers strike” also for UK

securitisations, notably by US banks. There could be advantages in creating a more solid basis for UK mortgage securitisations with a stronger base of institutional investors, such as insurance companies and pension funds. The UK authorities passed legislation early in 2008 enabling the issuance of regulated covered bonds compliant with the UCITS Directive, thereby putting the UK at par with some of its European counterparts. This would also provide financial institutions with an expanded number of instruments with which to undertake secured borrowing, while simultaneously providing investors with an additional choice of instruments through which they could obtain the security of direct recourse to the underlying assets. However, after robust levels of issuance for a number of years, the covered bonds market subsequently followed the dislocation of other secured and unsecured credit markets over the course of 2008, as both primary and secondary trading volumes diminished substantially.

Lending standards and “subprime” lending

26. Poor lending standards, whereby customers are exposed to excessive levels of risk, can be bad both for borrowers and the soundness of banks. A designated subprime mortgage market did not develop in the United Kingdom and non-deposit taking institutions, which have often been aggressive in lowering lending standards, accounted only for around 1% of the stock of mortgages. Mis-selling of mortgages is likely to have been a relatively minor problem as the sale of mortgage products both by banks and mortgage brokers is closely regulated in terms of suitability for the customer by conduct of business regulations for financial firms.⁸ There is nevertheless evidence of risky lending practices in the mortgage market: there was a significant proportion of self-certified loans and a very large market in buy-to-let mortgages, both of which the FSA considers higher risk for the lender, in part because self-certification increases the likelihood of fraud. Strikingly, these two risky categories of lending accounted for one third of the flow of new mortgages in recent years and already accounted for 12–14% of the stock of arrears by September 2008, far above the rate of arrears on conventional mortgages. Some lenders reduced lending standards during the upswing of the credit cycle, increasing lending to risky categories, extending the maturity of mortgages and allowing higher loan-to-value ratios (LTVs) for mortgages. Northern Rock, for example, offered some loans with LTVs up to 125%, which left borrowers and the bank very vulnerable. Had mortgage standards been tighter, some problems may have been avoided. The regulator could limit the use of high LTV loans by raising the capital charge and closer supervisory attention is warranted for particular segments, such as buy-to-let lending. The FSA plans to publish a paper in September of this year on mortgage regulation considering all aspects of regulation. It will also consider moving from general standards of lender behaviour to prescriptive product regulation, including maximum loan-to-value and loan-to-income caps.

Remuneration

27. Inappropriate remuneration schemes can misalign incentives between banks' management and their shareholders, leading to excessive risk taking. In particular, bonus schemes that reward the short-term performance of an individual can lead managers to increase short-term returns, with the potential of risking greater losses in the future. The Financial Stability Forum (FSF, 2008) has encouraged supervisors to mitigate risks arising from inappropriate incentives. The FSA has considered remuneration packages, as well as aspects of corporate governance, as part of its assessment of risk in financial institutions for some time. However, supervisory information in this area appears to have been limited and no aggregate data on remuneration packages and their components in financial markets are publicly available. In October 2008, the FSA wrote a “Dear CEO” letter to banks for an explanation of their policies in this area and has underlined that remuneration issues could ultimately be reflected in higher capital requirements. The government has also asked banks in receipt of capital assistance to show restraint in paying bonuses. Although it is important to ensure that policy in this area does not lead to a loss of talent towards

8. Kempson (2008) indeed suggests that UK mortgage regulation has some lessons for the United States.

unregulated entities, the current situation could be considerably improved if bonuses were paid over much longer periods, rather than being tied to quarterly or annual results, and perhaps also linked to the performance of the firm as a whole rather than individual traders or managers. The FSA's recent draft Code on Remuneration Policies would move in this direction, by providing that firms should not assess performance solely on basis of short-term performance and requiring good procedures to be in place in line with sound risk management (FSA, 2009). A wider review of corporate governance on bank boards is also underway.

Supervision

28. The UK authorities have developed their own distinctive framework for prudential supervision with a strong emphasis on risk- or principles-based supervision, rather than relying more heavily on rules and one-size-fits-all quantitative regulations.⁹ The FSA has developed the ARROW approach to regulation: this determines what resources should be devoted to supervision of each institution, according to the risk it poses to the system. Such risks to the system reflect in turn both the riskiness of its activities and the impact on the overall financial system if the risks were to materialise. The ARROW 1 approach, adopted in 2001, sought to assess risk for individual firms on the basis of identifying particular areas of risk in accordance with risk categories. The initial "Impact and Probability model" featured a complex mapping of indices of risk against groups of business and control risks. This gave rise to a net probability of risk to the FSA objectives and resulting impact and probability scores. ARROW 2, introduced in 2006, improved on ARROW 1 by being more readily communicable to firms, offering more proportionality and consistency with risks, and giving greater transparency in the relationship between the scores. This approach provides an inherent risk profile, which divides institutional risks into risks linked to the business model (including the banks' customers/products/markets and its business process) and environment risks (the state of capital markets, the economy and legal environment). Supervision under this approach is intended to examine how business risks are mitigated by associated controls within the business and its management, governance and culture. Capital and liquidity are regarded in this framework as "other mitigants". The net probability of a risk event occurring is assessed at major periodic internal FSA meetings of supervisors and managers,¹⁰ and leads to a remedial supervisory programme of greater or less intense prudential supervision. However, as discussed below in the context of Northern Rock, this system appears to have suffered from significant shortcomings in the practical application of the ARROW procedure. Greater disclosure of the assessments resulting from the ARROW process and trigger ratios could improve the market discipline on banks as well as the supervisor. Although care would be needed in communicating the outcomes of the assessments, this would be consistent with the importance accorded to market discipline in the UK's risk-based approach to supervision.

Lessons for supervision from the Northern Rock failure

29. The failure of Northern Rock led to an internal FSA report that highlighted a range of serious failings in its supervision (FSA, 2008a). Among high impact firms, those whose failure could generate systemic risks, Northern Rock had one of the longest regulatory periods between formal ARROW assessments (36 months as compared to 18–24 for most other banks), the lowest number of close and continuous regular surveillance meetings and was the only high impact firm without a Risk Mitigation Programme.¹¹ Supervision had also been hindered by Northern Rock being moved between FSA divisions

9. The approach has also been dubbed "light-touch approach".

10. The ARROW assessments for individual banks are not in the public domain.

11. According to FSA (2006) page 20, "Once during every regulatory period we will perform a firm risk assessment. This risk assessment will have a planning, discovery, evaluation and communication phase. During the rest of the regulatory period (until we conduct the next re-assessment), the firm is subject to ongoing monitoring. The results of the risk assessment itself may also lead to further actions during the rest

three times in as many years. Supervisory resources in the years prior to the crisis were diverted by takeovers, demutualisation and the implementation of Basel 2. The division mainly responsible for Northern Rock had suffered staff cuts. Records of supervisory meetings were often not kept. Even as late as spring 2007, Northern Rock was allowed to pay a large dividend and reduce its capital adequacy target. This was only months before it failed and at a time when the FSA was already concerned about its liquidity (Treasury Committee, 2008a).

30. Underlying these regulatory difficulties were problems with the application of the FSA's ARROW 1 risk assessment mechanism (FSA, 2008a). Supervisory teams did not have to contribute developed financial analyses under ARROW 1,¹² and hence danger signs such as the high publicly-announced target for asset growth and heavy reliance on wholesale funding were missed. The ARROW panel consequently agreed a long review interval of 36 months, on the basis of "behaviour and quality of management", while it judged risks as being of "low probability".

31. The FSA is addressing shortcomings in the way banks are supervised, including by raising senior manager engagement with high impact firms; increasing the number of supervisors engaged in high impact firms; increasing the focus on prudential supervision, especially liquidity and stress testing; raising emphasis on assessing the competence of firms' management; and improving the use of information and intelligence. The ARROW 2 process also provides a sounder basis for supervision than ARROW 1. There will be a greater emphasis on in-depth financial and quantitative analysis, and peer-group comparison in the FSA's approach to supervision. A broader issue is whether macroprudential elements are sufficiently noted in the ARROW process and how the priority risks in the FSA's Financial Risk Outlook are "effectively operationalised" (FSA, 2008a). Connecting macro-prudential analysis to the day-to-day supervisory process is a difficult challenge. The FSA has implemented a process of providing supervisory staff tailored guidance derived from such analysis including its own Financial Risk Outlook document.

Policies for crisis management and resolution

32. The financial crisis, particularly the failure of Northern Rock, exposed a number of weaknesses in the policy and legal framework for crisis management and resolution. Under the 1997 Memorandum of Understanding, the FSA had regulatory responsibilities in this context with the Bank of England being lender of last resort. However, no instruments to take control of a failing bank existed. General corporate insolvency provisions are unsuitable for banks because of the importance of confidence and the speed of possible bank runs, and there is no provision for continuity of service or for depositors to be treated differently from other creditors.

33. Under the Banking Act 2009, the Special Resolution Regime was introduced to allow pre-insolvency intervention in UK based deposit takers. The Bank of England is at the core of this mechanism as an independent agency with the relevant technical competence and due to its role with regard to overall financial stability. Unlike the US system of Prompt Corrective Action (PCA), intervention is dependent on both qualitative and quantitative criteria. Under the Banking Act the FSA will trigger the mechanism as the supervisor. Triggering is to be based on the statutory 'threshold conditions' against which the FSA already authorises and supervises banks, which include capital and liquidity measures. If a bank is failing or is likely to fail to meet the threshold conditions, the FSA will determine whether there are any actions – other than resolution – that could be taken by the bank to re-establish its compliance with the threshold conditions. Once an institution is put into the regime, there are three main options for the Bank of

of the regulatory period directed towards specific issues. These actions are known as a Risk Mitigation Programme (RMP)".

12. Such as assessment of the company's projections of profitability and growth, which would be undertaken in a typical credit analysis.

England: insolvency (closure and payout), a bridge bank or accelerated transfer to a private sector purchaser. In addition and as a last resort if the other options are inappropriate and a specific and more stringent financial stability threshold has been reached, the Treasury may choose to place a bank (or its UK incorporated holding company) into temporary public ownership. In the case of insolvency, the primary duty of the administrator is to help the FSCS to meet its needs with regards to deposit insurance. The Treasury is expected to be closely involved (as it has in recent initiatives to support the financial system), particularly if there are international law issues or if there are significant sums of public money at stake.

34. The new arrangements meet an important need in having a mechanism for crisis management and resolution with a pre-insolvency trigger. This is a useful new instrument to help maintain financial stability, protect taxpayers, obtain continuity of banking facilities and protect depositors' interests. There remain some concerns that the new regime will cut across creditors' and shareholders' rights relative to a normal insolvency and that, under set off and netting arrangements for example,¹³ the creditors in a residual bank could be worse off than under the previous arrangements for liquidation. However, the new arrangements include measures to safeguard property rights. These measures ensure that the Treasury can put in place measures to compensate shareholders and creditors for the loss or interference in their property rights when a bank is placed into the special resolution regime. In addition, a number of measures have been put in place via secondary legislation to ensure that set-off and netting arrangements are protected and that creditors of a resolved bank cannot be left worse-off than if a bank had entered into insolvency proceedings. The new system will make it easier for the authorities to resolve failing banks which is important in disciplining private sector incentives in the long run, and retains considerable flexibility in how the authorities react. There is a risk, however, that the arrangements will strain the managerial, legal and accounting resources of the Bank of England, particularly if there are multiple failures. The Bank of England is addressing this risk by creating a new specialist resolution unit that can draw on external specialist resources when required.

35. Financial stability has been added to the criteria in the Enterprise Act under which mergers can be referred to the Secretary of State for Business, Enterprise and Regulatory Reform to consider whether it is in the overall public interest for the normal competition approval process to apply, although mergers remain subject to the EU rules. In effect, the minister can take a rapid decision, advised by the tripartite committee and the Office of Fair Trading. This change allowed the merger of HBOS and Lloyds TSB to be approved speedily. In this case, however, the merger created a bank with almost one-third of the UK market, which may affect competition in the sector and has created an institution, which is likely to have systemic implications if it were to fail.

Systemic risk and macroprudential regulation

36. The role of banks in the prolonged credit and asset-price cycle that has turned so dramatically raises the question of whether policy should be used to "lean against the wind" during the upswing. These system-wide macroprudential concerns go beyond the institution-specific concerns that have been the focus of microprudential regulation. Experience of conducting such policies is limited internationally, although Wadhvani (2008) argues that the Swedish authorities have been able to undertake them. The system of countercyclical provisioning in Spain may also have helped its institutions, as might setting capital requirements as a function of interest rates as is done in Argentina.

37. Under the pre-crisis arrangements, the Bank of England had responsibility for contributing to the maintenance of financial stability and this was a core purpose of the Bank, alongside monetary policy. The Bank produced twice-yearly Financial Stability Reports and participated in the tripartite arrangements but

13. These are means to ease operations in markets such as swaps by each partner agreeing to accept net exposures to the transaction in question.

had no dedicated instrument with which to target financial stability and did not have direct access to a full set of supervisory information, although the Bank's analysis of financial stability fed into the FSA's ARROW process of risk assessment as well as being sent to the boards of UK banks.

38. Under the Banking Act 2009, the Bank of England will have a legal objective "to contribute to protecting and enhancing the stability of the financial system of the United Kingdom".¹⁴ The Act will also formalise the Bank's role in supervision of payments systems. A Financial Stability Committee, chaired by the Governor, will be set up as a sub-committee of the Bank's Court of Directors to deal with this objective (HM Treasury, 2008a, b, c). An important innovation under the Act is that the FSA be able to request data from banks that it thinks is or may be relevant for the stability of individual institutions or one or more aspects of the UK financial system. This information can be disclosed to the Bank or HM Treasury in order to provide the basis for a much more detailed understanding of developments in the banking system. In particular, experience in the last years of the credit upswing suggests that a few institutions can have a disproportionate effect on the overall availability of credit. The hope is that the Bank will have the information to signal concerns about this to the FSA, perhaps having sufficient basis to signal this publicly if it is sufficiently concerned. These changes are not expected to change substantially the operation of the tripartite committee which, continuing the practice under the Memorandum of Understanding between the Treasury, Bank and FSA, meets once a month, together with a substratum of cooperation at a lower level (Box 4.1). By giving the Bank more involvement and redefining responsibilities more clearly, it is hoped that the new regime will be better able to deal with macroprudential risks. However, there remain risks of unhelpful conflict between the Bank and the FSA or that, equally, importantly, issues may be perceived as falling between the remit of the two organisations. It may be difficult to reconcile the overall macroprudential objective within a structure of two independent institutions, rather than perhaps linking them more closely institutionally and giving responsibility to a joint board of both institutions.

Understanding of the risks in the credit cycle

39. An understanding of the economic and financial cycle is essential to the implementation of macroprudential policy. Timely warnings regarding systemic risks are required as an input to policy decisions, as well as to strategies and market behaviour of financial institutions. Many central banks have sought to develop their macroprudential surveillance, monitoring conjunctural and structural trends to give warning of the approach of financial instability. The Bank of England publishes a semi-annual Financial Stability Report, covering both international and domestic developments, and the FSA has an annual Financial Risk Outlook. These assessments were intended in part to influence the ARROW process, although the FSA Internal Auditors in their report on Northern Rock suggested that priority risks in the Financial Risk Outlook needed to be "effectively operationalised" (FSA, 2008a).

40. The most recent Financial Stability Report before the crisis concluded that the "UK financial system remains highly resilient", while noting that macroeconomic stability and competition in the financial sector have "encouraged a further increase in risk taking" and that this "increased the vulnerability of the system as a whole to an abrupt change in conditions" (Bank of England, 2007). Risks were considered to arise from credit markets, which weakened credit risk assessment, impaired risk monitoring and made financial institutions more dependent on market liquidity leading to "warehousing risk" if institutions piled up loans they were unable to securitise. These were held to compound pre-existing risks arising from high asset prices and vulnerabilities in risk premia, high levels of corporate

14. An explicit definition of financial stability is not provided in the Act, beyond these words. It could be argued that a definition would be appropriate so as to constrain future interpretations, such as defining systemic risk, financial instability or disorder as entailing heightened risk of a financial crisis "a major collapse of the financial system, entailing inability to provide payments services or to allocate credit to productive investment opportunities" (Davis, 2002).

and household debt, dependence on market infrastructure, large financial imbalances among the major economies, as well as from rising systemic importance of large complex financial institutions. There was seen to be a risk of unwinding of low risk premia, triggering a pickup in corporate defaults, an unwinding of leveraged positions in corporate credit markets and consequently lower market liquidity and further falls in asset prices with a generalised retreat from risk-taking and a rise in correlation across markets reducing the scope for diversification against shocks. Such a scenario was seen as calling the ‘originate and distribute’ business model into question. Meanwhile, the FSA (2007a) in its Financial Risk Outlook (FRO), highlighted as “priority risks” that firms should evaluate their responses to extreme situations (stress test) despite current low volatility; they should be aware of valuation problems with illiquid instruments (albeit in the context of conflicts of interest); and they should consider operational and legal risks with derivatives. They were also urged to bear in mind dangers arising from terrorism, crime and, interestingly, the volume of regulatory reform. The FRO also noted that some consumers were at risk from high debt levels. However, the authors felt that “it is highly unlikely that consumer indebtedness problems could lead to a financial stability problem”.¹⁵ While highlighting a number of risks and capturing a number of the mechanisms by which these materialised, Davis and Karim (2008) note that the Bank of England and the FSA, in common with other macroprudential analysts, did not capture the full extent of the crisis. Partly based on the FSA’s view of the remoteness of risks from household debt, no specific action at the level of bank regulation was taken to limit household debt, such as tightening regulations relating to mortgages or increasing capital requirements. Such measures were used to a modest extent, for example, in Estonia and Ireland which faced similar housing booms.¹⁶

Stress testing

41. Stress testing at the system-level, rather than for individual institutions, attempts to quantify macroprudential risks. In 2003, the IMF undertook a Financial Sector Assessment Programme (FSAP) that included extensive stress testing. UK banks were found to be very resilient at that time. A problem with stress testing is that shocks have to be realistic but the bank management’s view of realism may be excessively conditioned by current market conditions (“disaster myopia”) or undermined by incentives to maximise returns in the short run. Stress testing of financial innovations is particularly uncertain because there was no experience to show how the market might be tested in a downturn and there is Knightian uncertainty about the full range of the probability distribution. For example, the risks inherent in CDOs were underestimated until they materialised in stressed market conditions, revealing that excessively optimistic assumptions had been made. Such financial innovations need to be assessed for their macroprudential impact by the Bank of England and not just by the regulators: the Bank should be involved with the details and preparation of regulation generally and this must include the evaluation of financial innovations that could have a systemic impact.

Regulation and pro-cyclicality

42. There is limited international experience with designing regulatory standards that act against credit and asset-price cycles, for example by increasing minimum capital ratios to dampen lending growth. There is an on-going debate about whether Basel 2 has made the financial system more or less pro-cyclical. Through-the-cycle ratings should tend to dampen the pro-cyclical forces previously at work (Bank of England, 2008a). The requirement for stress testing for a downturn under Pillar 2 should also act against pro-cyclicality by making banks consider the range of risks that can occur during a cycle or even a long period of time. However, the increased use of marking-to-market and banks’ own assessment of risk

15. FSA (2007a), page 9.

16. Estonia increased the risk weighting on all loans secured by mortgages on residential property and limited mortgage interest rate deductibility. In Ireland the risk weighting on high LTV mortgages for owner-occupiers was raised, as was that for exposure to let property and to commercial property.

may lead banks hit by falling credit quality to contract balance sheets in downturns since raising capital is difficult in such conditions and thereby exacerbate the underlying weakness (Goodhart, 2005). Tougher liquidity standards introduced since the crisis will help to reduce pro-cyclicality, for example, by reducing the ability for banks to expand balance sheets rapidly using wholesale funding.

43. The UK authorities are considering explicit countercyclical regulation, although the details are not yet firm (Bank of England, 2008b). These could include an overall leverage ratio of capital to unadjusted (rather than risk-weighted) assets. This would limit the scope under Basel 2 arrangements for banks to assess their own risk by providing a ceiling and may be helpful in making regulation more transparent, although it is essential that the ceiling applies to all relevant assets and does not encourage banks to use off-balance sheet structures to escape the ceiling. It is notable that, prior to the crisis, risk-adjusted capital adequacy ratios were relatively stable, but leverage ratios (asset to capital ratios unadjusted for risk) rose sharply (Table 4.2). This is consistent with UK banks raising their exposure to apparently high quality assets such as AAA-rated CDO tranches, which later generated major losses. Time varying capital requirements related to lending growth are also under consideration, as is the purchase of catastrophe capital insurance (Kashyap *et al.*, 2008). Dynamic provisioning requires banks to build up loss reserves in good times to cope with bad times and has been implemented in Spain. UK banks did not build up extra provisions in the upturn: the non-performing loans/total loan ratio fell from 2.5% in 2003 to 1% in 2006, while the ratio of provisions to non-performing loans fell from 70% to 54.6%. Potential conflicts with tax rules and with accounting standards would need to be addressed if this approach is to be implemented. More specific regulatory interventions could also be considered such as limiting loan to value (LTV) ratios for mortgages or restrictions on income gearing. In general, countercyclical policies based on discretion are likely to be difficult to implement as the authorities can easily share the same excessive optimism as the private sector about future prospects and risks. In addition, authorities may face political pressures if they try to contain the expansionary phase of a credit cycle, particularly from the financial industry. A rules-based approach to pro-cyclicality, although blunter, would have the benefit of being transparent.

Strengthening banking regulation and supporting financial stability

44. Following a prolonged credit and asset-price cycle, the United Kingdom is facing a serious credit crunch with considerable impairment of its banking system. The actions being taken to sustain the banking system are the most immediate challenge facing the authorities. The crisis has, however, revealed a number of weaknesses in the system of micro and macro-prudential surveillance. Policies have already been or are being strengthened in terms of crisis management and resolution with the Special Resolution Regime and changes to the deposit guarantee scheme. In addition, the macroprudential regime should become more effective as the role of the Bank of England is enhanced by the Banking Act 2009. Major changes are also being considered to the regulation of liquidity, where the previous system of regulation imposed very little by way of restrictions on banks' activities. Broader changes will need to be considered and the authorities will need to rebalance an approach that has relied heavily on principles and market information, perhaps in terms of more quantitative restrictions and a greater use of rules.¹⁷ A broader issue is how to link macro-prudential and micro-prudential regulation more effectively (Barrell and Davis, 2008), including the design of a countercyclical regulatory framework. It is vital that regulation of both types becomes more effective in the sense of ensuring that risky activities do not migrate either internationally or to less-regulated financial institutions such as hedge funds (Goodhart, 2008). In all these areas, it is important for the UK authorities to support and engage constructively in the many international and EU initiatives both to ensure a level playing field in terms of competition but also to ensure that the risk of international

17. As Lord Mandelson, Secretary of State for Business, Enterprise and Regulatory Reform, put it in a speech at the City Trade and Investment dinner at Mansion House (4 March 2009): "We used to talk about light touch; now it's going to be about right touch".

spillovers is minimised. The recommendations for further reform (Box 2) are close to those recently issued by the Turner Review (FSA, 2009).

Box 2. Recommendations on banking regulation and financial stability

The immediate priority of the authorities should be sustaining the banking system. For the longer term, UK banking regulation should be strengthened in the light of recent developments and weaknesses that have been demonstrated. Many of these reforms can be advanced by the UK authorities acting alone, although their impact would be greater if coordinated with other countries. Constructive engagement with international and European initiatives will be essential to securing the best outcomes in most areas. The ECOFIN Financial Turmoil Roadmap and the Financial Stability Roadmap are important frameworks in this regard, alongside the G20 Global Plan for Recovery and Reform (2009) and the work by the de Larosière Group (2009). The Turner Review makes a number of valuable recommendations for national regulation, as well as the supervision of cross-border institutions.

This main recommendations are:

Capital adequacy requirements

- Capital adequacy standards should be strengthened to ensure that banks have a sufficient capital cushion for the risks being undertaken. Banks should be required to hold adequate capital for off-balance sheet risks, so as to counter regulatory arbitrage and reputational risks. Consistent with this, the accounting treatment of off-balance sheet assets should be aligned with the underlying risks.
- External credit ratings should be used with due caution by regulators and supervisors in the assessment of the riskiness of banks' activities and should not substitute for their own analysis.

Liquidity standards and funding

- The new liquidity proposals for banks would be a marked advance and should be implemented. Consideration should be given to further measures, including the recommendations in the Turner Review.
- Over time, the legal and regulatory framework should be reviewed to ensure that there are no undue barriers to the development of a covered bond market or the well-functioning of the securitisation market.

Lending standards

- Lending standards should receive greater regulatory and supervisory attention. Limits on high loan-to-value (LTV) mortgage loans should be introduced or capital requirements for high LTV mortgages raised. Greater scrutiny should be applied to risky and fast-growing activities as these emerge, such as buy-to-let activity lending.

Bank supervision

- Banks should be more tightly regulated and supervised, together with other financial institutions. The FSA has been taking steps to make banking supervision more effective by increasing the resources devoted to major institutions, giving more attention from senior management in the FSA and additional information from banks.
- The quality of financial analysis in the ARROW process should be further improved with a greater emphasis on evaluating comparative performance, as well as better understanding overall developments in the credit market. Macro-prudential concerns should have a real impact on the ARROW assessments.
- Trigger ratios and the details of ARROW assessments, as well as future individual liquidity adequacy standards, should be published as appropriate and in line with international best practice to enhance transparency and market discipline.
- Consideration should be given to what lessons can be learnt from the more rules-based approaches to supervision practiced in other OECD countries.

Risk management

- The regulation and supervision of remuneration policies should be tightened. The FSA should improve its information gathering. It has already clarified what constitutes appropriate practice. Risky practices should result in regulatory or supervisory intervention, such as raising capital requirements.

Crisis management and resolution

- The Special Resolution Regime is an important step forward. Consideration should be given to numerical targets, alongside qualitative judgments, for prompt corrective action. The Bank of England needs to allocate sufficient resources to deal with the possibility of multiple bank failures.

Deposit insurance

- The deposit insurance scheme has been strengthened by raising coverage, removing coinsurance and renewed attention to the operational aspects. The system could be prefunded to a greater extent and consideration given to introducing risk-based premia along the lines of schemes used in other countries.

Macroprudential regulation and pro-cyclicality

- The pro-cyclicality of the financial system should be damped. Consideration should be given to the use of an overall leverage ratio, covering all relevant assets, and dynamic provisioning. The development of other instruments should also be considered. In general, a rules-based framework may be more effective than discretion.
- The Banking Act will provide an improved framework for dealing with risks to overall financial stability. The smooth functioning of the relationship between the Bank of England and the FSA should be monitored and other arrangements introduced if necessary.
- The Bank of England and the FSA should work closely together in the detailed evaluation and preparation of regulation covering financial innovations that could have a systemic impact.

Bibliography

- Bank of England (2007), *Financial Stability Report*, April 2007, Bank of England, London.
- Bank of England (2008a), *Financial Stability Report*, April 2008, Bank of England, London.
- Bank of England (2008b), *Financial Stability Report*, October 2008", Bank of England, London.
- Barrell, R. and E. P. Davis (2008), "The Evolution of the Financial Market Crisis in 2008", *National Institute Economic Review*, No. 206.
- Brunnermeier, M., A. Crockett, C. Goodhart C, A. Persaud and H. Shin (2009), "The Fundamental Principles of Financial Regulation", Geneva Reports on the World Economy 11, International Center for Monetary and Banking Studies and Centre for Economic Policy Research.
- Davis, E. P. (2002), "A Typology of Financial Crises", *Financial Stability Review*, No. 2, Austrian National Bank.
- Davis, E. P. and D. Karim (2008), "Could Early Warning Systems Have Helped to Predict the Sub-prime Crisis?", *National Institute Economic Review*, No. 206.
- De Serres, A., S. Kobayakawa, T. Sløk and L. Vartia (2006), "Regulation of Financial Systems and Economic Growth", *OECD Economics Department Working Papers*, No. 506.
- Diamond, D. and P. Dybvig (1983), "Bank Runs, Deposit Insurance and Liquidity", *Journal of Political Economy*, No. 91.
- Financial Stability Forum (2008), *Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience*, FSF, Basel.
- FSA (2006), "The FSA's Risk Assessment Framework", Financial Services Authority, London.
- FSA (2007a), *Financial Risk Outlook*, 2007, Financial Services Authority, London.
- FSA (2007b), "Review of the Liquidity Requirements for Banks and Building Societies", *Financial Services Authority Discussion Paper*, No. 07-7, London.
- FSA (2007c), "Our Pillar 2 Assessment Framework", Financial Services Authority, London.
- FSA (2008a), "The Supervision of Northern Rock. A Lessons Learned Review", FSA Internal Auditors, Financial Services Authority, London.
- FSA (2008b), "Strengthening Liquidity Standards", *Financial Services Authority Discussion Paper*, No. 08-22, London.
- FSA (2009), *The Turner Review. A Regulatory Response to the Global Financial Crisis*, March, London.
- Goodhart, C. A. E. (2005), "Financial Regulation, Credit Risk and Financial Stability", *National Institute Economic Review*, No. 192.

- Goodhart, C. A. E. (2008), “The Boundary Problem in Financial Regulation”, *National Institute Economic Review*, No. 206.
- HM Treasury (2006), “Memorandum of Understanding between HM Treasury, the Bank of England and the Financial Services Authority”, HM Treasury, London.
- HM Treasury (2008a), “Financial Stability and Depositor Protection: Strengthening the Framework”, January 2008, HM Treasury, London.
- HM Treasury (2008b), “Financial Stability and Depositor Protection: Special Resolution Regime”, July 2008, HM Treasury, London.
- HM Treasury (2008c), “Financial Stability and Depositor Protection: Further Consultation”, July 2008, HM Treasury, London.
- IMF (2003), “United Kingdom, Financial Sector Stability Assessment”, *Country Report 03/46*, International Monetary Fund, Washington DC.
- IMF (2008), “Global Financial Stability Report, October 2008”, International Monetary Fund, Washington DC.
- Kashyap, A. B. Rajan and J. Stein (2008), “Rethinking Capital Regulation”, paper presented at the Kansas Fed Symposium at Jackson Hole, Wyoming, August 2008.
- Kempson, E. (2008), “Looking Beyond Our Shores: Consumer Protection Regulation Lessons from the UK”, *Working Paper UCC08-16*, Center for Housing Studies, Harvard University.
- OECD (2007), “Ensuring Regulatory Effectiveness and Efficiency”, OECD, Paris.
- OECD (2009), *OECD Economic Surveys: Euro Area*, OECD, Paris.
- Schich, S. (2008), “Financial Crisis: Deposit Insurance and Related Financial Safety Net Aspects”, *Financial Market Trends*, Vol. 2008/2, No. 95, Paris.
- The Banker (2008), “Top 1 000 World Banks”, July.
- The Group of Twenty (2009), “The Global Plan for Recovery and Reform”, April.
- The de Larosière Group (2009), “The High Level Group on Financial Supervision in the EU: Report”, February.
- Treasury Committee (2008a), “The Run on the Rock”, House of Commons Treasury Select Committee Report, UK Parliament, London.
- Treasury Committee (2008c), “Banking Reform”, House of Commons Treasury Select Committee Report, UK Parliament, London.
- Wadhvani, S. (2008), “Should Monetary Policy Respond to Asset Price Bubbles? Revisiting the Debate”, *National Institute Economic Review*, No. 206.
- Wehinger, G. (2008), “Lessons from the Financial Market Turmoil: Challenges ahead for the Financial Industry and Policy Makers”, *Financial Market Trends*, Vol. 2008/2, No. 95, Paris.

WORKING PAPERS

The full series of Economics Department Working Papers can be consulted at www.oecd.org/eco/working_papers/

716. *The English National Health Service: an economic health check*
(July 2009) Peter Smith and Maria Goddard
715. *Economic growth and the role of taxation- disaggregate data*
(July 2009) Gareth D. Myles
714. *Economic growth and the role of taxation – Aggregate data*
(July 2009) Gareth D. Myles
713. *Economic growth and the role of taxation – Theory*
(July 2009) Gareth D. Myles
712. *The effectiveness of education and health spending among Brazilian municipalities*
(July 2009) Luiz de Mello and Mauro Pisu
711. *The bank lending channel of monetary transmission in Brazil: A VECM approach*
(July 2009) Luiz de Mello and Mauro Pisu
710. *How does decentralised minimum-wage setting affect unemployment and informality? The case of Indonesia*
(July 2009) Margherita Comola and Luiz de Mello
709. *Intergenerational social mobility in European OECD countries*
(July 2009) Orsetta Causa, Sophie Dantan and Åsa Johansson
708. *Equity in student achievement across OECD countries: an investigation of the role of policies*
(July 2009) Orsetta Causa and Catherine Chapuis
707. *Intergenerational social mobility*
(July 2009) Orsetta Causa and Åsa Johansson
706. *Taxes or grants: what revenue source for sub-central governments?*
(July 2009) Hansjörg Blöchliger and Oliver Petzold
705. *The spending power of sub-central governments: a pilot study*
(July 2009) Steffen Bach, Hansjörg Blöchliger and Dominik Wallau
704. *Price and volume elasticities of Brazilian foreign trade: A profit function approach*
(July 2009) Luiz de Mello and Mauro Pisu
703. *Current account sustainability in Brazil: A non linear approach*
(July 2009) Luiz de Mello and Matteo Mogliani

702. *The incentives to participate in and the stability of international climate coalitions: a game-theoretic approach using the WITCH Model*
(July 2009) Valentina Bosetti, Carlo Carraro, Enrica De Cian, Romain Duval, Emanuele Massetti and Massimo Tavoni
701. *The economics of climate change mitigation: how to build the necessary global action in a cost-effective manner*
(June 2009) Jean-Marc Burniaux, Jean Chateau, Rob Dellink, Romain Duval and Stéphanie Jamet
700. *Capital inflows, household debt and the boom bust cycle in Estonia*
(June 2009) Zuzana Brixiova, Laura Vartia and Andreas Wörgötter
699. *The effect of financial crises on potential output: new empirical evidence from OECD countries*
(May 2009) Davide Furceri and Annabelle Mourougane
698. *Employment - productivity trade-off and labour composition*
(May 2009) Hervé Boulhol and Laure Turner
697. *Labour market flexibility in Estonia: what more can be done?*
(May 2009) Zuzana Brixiova
696. *Structural policies to overcome geographic barriers and create prosperity in New Zealand*
(April 2009) Yvan Guillemette
695. *Ten years of product market reform in OECD countries – insights from a revised PMR indicator*
(April 2009) Anita Wölfl, Isabelle Wanner, Tomasz Kozluk and Giuseppe Nicoletti
694. *Structural reforms and the benefits of the enlarged eu internal market*
(April 2009) Jens Arnold, Peter Höller, Margaret Morgan and Andreas Wörgötter
693. *Co-benefits of climate change mitigation policies: literature review and new results*
(April 2009) Johannes Bollen, Bruno Guay, Stéphanie Jamet and Jan Corfee-Morlot
692. *The impact of monetary and commodity fundamentals, macro news and central bank communication on the exchange rate: Evidence from South Africa*
(April 2009) Balázs Égert
691. *Assessing the impacts of climate change: a literature review*
(April 2009) Stéphanie Jamet and Jan Corfee-Morlot
690. *The determinants of employment and earnings in Indonesia: a multinomial selection approach*
(April 2009) Margherita Comola and Luiz de Mello
689. *Inflation responses to recent shocks: do G7 countries behave differently*
(April 2009) Lukas Vogel, Elena Rusticelli, Pete Richardson, Stéphanie Guichard and Christian Gianella
688. *Infrastructure investment in network industries: the role of incentive regulation and regulatory independence*
(March 2009) Balázs Égert