

FINANCIAL INSTITUTIONS AND MARKETS

2007–2008 — The Year of Crisis

Edited by Robert R. Bliss and George G. Kaufman



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FINANCIAL INSTITUTIONS AND MARKETS: 2007–2008—THE YEAR OF CRISIS
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Section I

Northern Rock—The UK's Too Political to Fail Bank

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“Oh What a Fall Was There”: Northern Rock in 2007

Alistair Milne and Geoffrey Wood

Dramatis Personae

Applegarth, Adam: Former chief executive of Northern Rock
Coles, Adrian: Director general of the Building Societies Association
Darling, Alistair: Chancellor of the exchequer
Gieve, Sir John: Deputy governor of the Bank of England
King, Mervyn: Governor of the Bank of England
McCarthy, Sir Callum: Chairman of the FSA
Ridley, Matt: Former chairman of Northern Rock
Sants, Hector: Chief executive officer of the FSA
Tucker, Paul: Executive director, markets, Bank of England

The positions are those held at the time of the parliamentary enquiry into the collapse of Northern Rock.

Introduction and Background

Introduction

In the autumn of 2007 Britain experienced its first bank run of any significance since the reign of Queen Victoria.¹ The run was on a bank called Northern Rock. Britain had been free of such episodes not by accident, but because by early in the third quarter of the nineteenth century, the Bank of England had developed techniques to prevent them. These techniques had been used, in Britain and elsewhere, had worked, and

appeared to be trusted. Nevertheless, it was the decision to provide support for the troubled institution that triggered the run. That run was halted only when the chancellor of the exchequer (Alistair Darling²) announced that he would commit taxpayers' funds to guarantee every deposit at Northern Rock.

This chapter describes the events leading up to that run and sets out the sequence of responses to it, a sequence culminating in the still uncompleted (as of early November 2008) nationalization of Northern Rock.

Background

Northern Rock was created by the merger of two "building societies," the Northern Counties and the Rock, on 1 July 1965. Building societies were mutuals, owned by their depositors and their borrowers. Their deposits came primarily from retail customers, and their major (essentially sole) lending activity was to individuals to buy their residences. In the 1990s these organizations were allowed to demutualize, and "convert" (in the term of the time) to banks. Most of the large societies converted. Northern Rock did so on 1 October 1997.

Northern Rock's Story

The Development of Northern Rock to end-2006

Two features of Northern Rock's postdemutualization behavior were distinctive. It grew very rapidly. At the end of 1997 its assets (on a consolidated basis) stood at £15.8 billion. By the end of 2006 its assets had reached £101 billion. Despite this rapid growth, it never departed from its traditional focus on residential mortgage assets, which by end-2006 were £86.8 billion, that is, about 86% of total assets. Even so, at the end of the second quarter of 2007 these mortgage loans were only 8% (by value) of the stock of mortgage debt in the UK, and therefore only about 5% of total bank lending.

While on the asset side of the balance sheet it remained close to the traditional building society model, there were dramatic changes in the structure of its liabilities. It adopted an extreme originate to distribute model of funding, using securitization, the issue of covered bonds (bonds issued by banks and collateralized against property), and direct borrowing in the wholesale markets, to finance its lending.

The dependence on wholesale markets for the large majority of its funding was what most distinguished Northern Rock from other UK banks. Retail funds fell as a proportion of the total liabilities and equity of

Northern Rock from 62.7% at end-1997 to 22.4% at end-2006. So far as the Eurozone goes, there is according to the European Central Bank (ECB) no bank with such an extreme degree of reliance on wholesale funding. The same applies for all retail banks in the UK, and a fortiori for building societies, the regulation of which forbids such reliance on wholesale funding.

The unusual nature of the Northern Rock balance sheet is illustrated in the following table, which reports total assets, lending, and deposits of the ten largest UK banks and building societies, as of end-2006.

Table 1.1 illustrates three main points. First, Northern Rock was much smaller than the largest UK banks. Second, loans comprised a relatively large proportion of its balance sheet, that is, it maintained a traditional building society business on the asset side, similar to that of the only unconverted building society in this table, the Nationwide. Third, as already discussed, it relied far less than did other leading UK banks on deposit finance, with a ratio of deposits to total lending of only 31%. Northern Rock was thus pursuing a very unusual business model, with a building society's traditional concentration on illiquid long-term mortgage assets while at the same time relying on very nontraditional sources of securitised and wholesale funding.

Table 1.1 Assets and liabilities of the largest UK banks and building societies

<i>End-2006 (£ billion)</i>	<i>Assets (£ billion)</i>	<i>Loans (£ billion)</i>	<i>Deposits (£ billion)</i>	<i>Loans/ assets (%)</i>	<i>Deposits/ loans (%)</i>
RBOS	848	469	385	55	82
Barclays	997	282	254	28	90
HSBC (UK)	441	200	227	45	113
HBOS	455	217	107	48	49
Lloyds-TSB	346	190	141	55	74
Abbey	192	103	67	54	64
Nationwide	137	116	90	84	77
Northern Rock	101	87	27	86	31
Alliance and Leicester	69	48	30	70	61
Bradford and Bingley	45	36	22	80	61

Source: Bureau van Dijk Bankscope database and authors' calculations.

Table 1.2 Composition of Northern Rock's end-2006 liabilities

<i>£ billion</i>	<i>Total liabilities</i>	<i>Capital and reserves</i>	<i>Retail</i>	<i>Wholesale</i>	<i>Securitization</i>	<i>Covered bonds</i>
Level end-2006	101.0	7.7	22.6	24.2	40.2	6.2
Increase on 2005	18.3	-0.5	2.5	2.9	10.6	2.7

Source: Northern Rock annual report and accounts 2006 and authors' calculations.

Table 1.2 provides a breakdown of Northern Rock's funding at end-2006.

This table highlights the importance of the various nonretail sources of funding. The issue of asset-backed securities, almost all through its "Granite" securitization vehicles, provided 40% of its end-2006 funding; wholesale borrowing provided a further 24%, and covered bonds 6%. The expansion of the Northern Rock balance sheet, that is, the increase in liabilities over the previous year, relied to an even greater extent on nonretail funding. Retail deposits provided only around 12% of this expansion while capital and reserves were actually *reduced* in the course of 2006. More than two-thirds of the 2006 expansion of the Northern Rock balance sheet was funded from the issue of mortgage-backed securities (MBSs) and of covered bonds.

The Challenge of Rolling Over Northern Rock Securitization

Northern Rock's securitization program, its most important source of nonretail funding, supported rapid balance sheet growth for several years. However, because securitization needed to be rolled over on a regular basis any difficulty in accessing securitization markets would have led to serious liquidity problems.

Table 1.3 shows the year-by-year growth in securitization by Northern Rock from its first use in 1999.

The share of funding from the issue of MBSs increased rapidly until 2004. While this share grew more slowly in 2005 and 2006, the volume of issuance reached its peak, with Northern Rock issuing more than £9 billion of net new MBSs in each of these two years.

Much of this securitised funding and also Northern Rock's other wholesale funding was short term. About half of their wholesale borrowing was at a maturity of less than one year. Even more important for their subsequent problems, the size of the Northern Rock securitization program meant that a large amount of mortgage-backed securities needed to be refinanced every year.

Table 1.3 The growth of Northern Rock securitization

	2006	2005	2004	2003	2002	2001	2000	1999
Nonrecourse (securitised) finance (in £ billion)	40.2	31.2	22.1	14.8	9.3	4.7	2.3	0.6
Percentage of customer loans (in %)	46	44	40	34	27	18	11	3
Year on year increase (in £ billion)	9.1	9.1	7.3	5.6	4.5	2.4	1.7	0.6

Source: Northern Rock annual reports and accounts, 2000–2006.

The magnitude of this refinancing is illustrated by Table 1.4. This table shows that net outstanding residential mortgage-backed securities (RMBS) at end-2007 were nearly £24 billion less than the total amount initially issued (£47.9 billion compared with £71.7 billion), that is, some £24 billion of originally issued securities were repaid to investors; much of this required financing by further issue of RMBS.

This need to refinance reflects the difficulties of managing a large RMBS program, particularly the problem of prepayment risk.

By end-2007 the remaining outstanding amount of the 2006 Granite issues had fallen by about 10% from their initial end-2006 levels, while

Table 1.4 Northern Rock residential mortgage-backed securitizations—amounts in issue

<i>Issue</i>	<i>End of year of issue</i>	<i>End-2007</i>
Granite Mortgages 99-1 plc 1 October 1999	600	0
Granite Mortgages 00-1 plc 1 March 2000	750	0
Granite Mortgages 00-2 plc 25 September 2000	1,300	0
Granite Mortgages 01-1 plc 26 March 2001	1,500	424
Granite Mortgages 01-2 plc 28 September 2001	1,500	0
Granite Mortgages 02-1 plc 20 March 2002	2,420	0
Granite Mortgages 02-2 plc 23 September 2002	2,748	1,069
Granite Mortgages 03-1 plc 27 January 2003	2,597	1,645
Granite Mortgages 03-2 plc 21 May 2003	2,305	963
Granite Mortgages 03-3 plc 24 September 2003	2,246	877
Granite Mortgages 04-1 plc 28 January 2004	2,827	1,486
Granite Mortgages 04-2 plc 26 May 2004	3,213	1,695
Granite Mortgages 04-3 plc 22 September 2004	3,787	1,962
Granite Master Issuer plc—Series 05-1 26 January 2005	4,000	2,795
Granite Master Issuer plc—Series 05-2 25 May 2005	3,762	2,414
Granite Master Issuer plc—Series 05-3 31 August 2005	582	504
Granite Master Issuer plc—Series 05-4 21 September 2005	3,891	2,383
Granite Master Issuer plc—Series 06-1 25 January 2006	5,048	4,424
Granite Master Issuer plc—Series 06-2 24 May 2006	2,786	2,460
Granite Master Issuer plc—Series 06-3 19 September 2006	5,400	4,762
Granite Master Issuer plc—Series 06-4 29 November 2006	3,206	2,787
Granite Master Issuer plc—Series 07-1 24 January 2007	5,607	5,607
Granite Master Issuer plc—Series 07-2 23 May 2007	4,571	4,571
Granite Master Issuer plc—Series 07-3 17 September 2007	5,074	5,074
Total:	71,720	47,901

Source: Northern Rock annual report and accounts, 2002–2007. For 2002 and earlier value at time of issue is the value of mortgages transferred to the securitisation vehicle which, because of the usual practice of overcollateralization, exceeds the par value of the issued notes by around 2%. For 2003 onwards the issued value is the par value of issued notes. Granite was the vehicle used for all Northern Rock residential mortgage-backed securitizations. There were also a small number of commercial mortgage-backed securitizations not included in this table.

those of the 2005 issues had fallen by about 30% and the 2004 issues by about 50% from their initial levels. There will have been some matching prepayment of the underlying mortgage pool (regrettably the Northern Rock annual reports and accounts do not provide figures on this) but this will certainly not have been so large, and as a result Northern Rock did face very large refinancing risk from its securitization program.³

This need to refinance maturing RMBS meant that in each year the total gross amount of Granite issuance (the first column of figures in Table 1.4) had to increase even more rapidly than the net issuance (shown in Table 1.3). In 2007 Northern Rock needed to make considerably larger gross RMBS issues than in any previous year and was increasingly vulnerable to a loss of liquidity in this market.

More than any other factor, it was the need to replace the funding obtained from short-term wholesale and securitization markets, markets which were effectively closed from the summer of 2007, that forced Northern Rock to turn to the Bank of England for liquidity support in September 2007.⁴ Indeed, the timing of this request for support can be explained from Table 1.4. It was the practice of Northern Rock, in order to reduce the costs of issuance, to make a few large issues each year rather than to issue frequently but in smaller amounts. Table 1.4 shows that £5 billion of Granite securitization was due to be issued on September 17, 2007. Northern Rock was unable to sell any of this RMBS issue to investors and had to hold these securities on its own balance sheet. The resulting funding gap could not be filled by wholesale borrowing; so Northern Rock was forced to request emergency liquidity support from the Bank of England in order to avoid default on its short-term wholesale borrowing.

Developments in 2007

So far we have described as best we can with public information the distinctive business model of Northern Rock. We next turn to describing its downfall.

During the first half of 2007 Northern Rock pursued its business model if anything even more aggressively than in previous years. Its net lending to customers rose by £10.7 billion, that is, by more than 12%. This continued growth was despite hints of trouble to come. The Bank of England's Financial Stability Report for April 2007 had, to quote Sir John Gieve, "identified the increasing wholesale funding of banks as a potential risk if markets became less liquid". (p. 14) According to Matt Ridley, that warning, and the expression of similar views in the Risk Outlook of the Financial Services Authority, influenced the decisions of Northern Rock's

board. Adam Applegarth claimed that Northern Rock had noted the warning signs of the U.S. subprime market, and slowed the growth rate of its lending (the available figures in fact suggest entirely the opposite). There were however some modest changes in its business model; it made some efforts to broaden its sources of funding, by expanding its range of retail products (and by starting to secure retail funding in Denmark), and it sought to cut back on the asset side of its balance sheet.

But it was too late. On 9 August 2007 there was a sharp “dislocation in the market” (p. 15) for Northern Rock’s funding, with the start of a major repricing of credit risk in global financial markets. The board of Northern Rock had not totally ignored the possibility of this repricing but had persuaded themselves that such a repricing would not have a major impact on their own business model:

[W]e expected that as markets became tighter and as pricing for risk changed that low-risk prime mortgages (and we were below half the industry average of arrears on our mortgage book) such a low-risk book would remain easier to fund than sub-prime mortgages elsewhere. (p. 16)

But this did not happen. Their belief that “high quality assets and transparency were the way to maintain liquidity” (p. 16) was falsified. Further, they had not foreseen all their funding markets closing simultaneously. In addition, and for much the same reasons, Northern Rock had little liquidity insurance. They had repeated the all too common mistake that Sherlock Holmes pointed out to Dr. Watson—they had confused the improbable with the impossible.

Thus, by early autumn 2007, Northern Rock was facing difficulties.⁵ These difficulties triggered the major changes to its assets and liabilities revealed in its end-2007 balance sheet. By then it had managed net issuance of only £5,580 million of collateralized paper (MBSs and covered bonds) against an increase in loans and advances to customers of £12,041 million, a consequence of its inability to sell the September 2007 issue of its MBSs to investors.⁶

The 2007 balance sheet also reveals the further losses of funding once Northern Rock had lost the confidence of wholesale investors and retail customers, with withdrawal of £15.3 billion of retail deposits, £8.2 billion of unsecured wholesale borrowing (“uncollateralized debt securities issued”), and £3.1 billion of wholesale deposits. Overall Northern Rock lost nearly 30% of its balance sheet funding in the final four months of 2007. The timing of these different funding withdrawals is of importance. As we describe below retail customers did not seek to withdraw their deposits from Northern Rock until after it became public knowledge, on

13 September 2007, that the Bank of England was putting in place emergency liquidity support for Northern Rock. The need for this support was triggered because Northern Rock was no longer able to fund itself in wholesale markets. What led to this major loss of wholesale funding?

Money Market Operations and Regulatory Issues

The Bank of England's Money Market Operations

We first describe the Bank of England's Money Market Operations and (in the following subsection) the arrangements for bank regulation and supervision in the UK. This description is necessary because these arrangements were fairly new, and this was their first test in a period of market stress.

The Bank of England's Money Market Operations are primarily used to implement the decisions made by the Monetary Policy Committee regarding interest rates. The Bank had recently changed its money market techniques because it, and market participants, was concerned about the high level of volatility in the overnight rate as compared to that in similar markets overseas.

Banks operating under the scheme system select their own target for the reserves they will hold with the Bank of England at the start of a "maintenance period." These periods run from one Monetary Policy Committee meeting to the next (roughly one month). Should banks require additional funds during this period, they may use the "standing facility," which allowed them to borrow all they need against eligible collateral and at a rate of 1% above Bank Rate. Another standing facility allowed banks to deposit funds with the Bank of England at a rate below Bank Rate.

On 28 June 2007, as part of its inquiry into the May 2007 Inflation Report, the Treasury Committee questioned Paul Tucker on how the money market reforms had settled in. He replied:

There were four objectives. The first and by far the most important was to reduce volatility in short term money market rates, the market in which we implement monetary policy. I am very glad that that has been successful. Volatility is much lower in short term money market rates and I hope it stays that way. The second objective was to improve the ability of the Bank through its operating system to inject liquidity into the banking system in normal conditions and in stress conditions. I believe that to be the case in normal conditions. I believe it to be the case in stress conditions but we thankfully have not yet been tested on that, but our apparatus is much better than it was in the past. (p. 37)

The Regulatory Structure

Not only had the Bank's money market techniques not been tested under stress conditions when Northern Rock erupted, neither had Britain's regulatory framework. At essentially the same time (1997) as the Bank of England had been granted "operational independence" to conduct monetary policy, it had lost the right and duty to supervise banks, which had been one of its duties since 1979.⁷ It retained responsibility for the overall stability of the financial system, but responsibility for supervising individual banks (and other financial institutions) was transferred to the Financial Services Authority (FSA).

There was then established a "Tripartite Arrangement," comprising the Bank, the FSA, and the treasury, the last inevitably involved because of the possibility of the commitment of public funds in some crisis.

Regulation in the Run up to Crisis

The FSA has recently published its own assessment of how well it supervised Northern Rock. This assessment contrasts remarkably with the views the FSA had expressed earlier. The more recent assessment was distinctly self-critical, and is well summed up in Darling's words:

In hindsight, it would have been much better, would it not, if the FSA when first looking at Northern Rock had said, "Hold on, what exactly is your fall-back position?" and when Northern Rock said, "We haven't got one" they did something about it. (p. 24)

The treatment of Northern Rock's capital adequacy requirements and of its liquidity confirms that its difficulties were a surprise to the regulators.

When adopting the Basel II requirements for capital adequacy, a bank may choose to adopt certain "advanced approaches" to their management of credit risk. The adoption of an advanced approach requires a waiver from the FSA.⁸ On 29 June 2007 Northern Rock was told by the FSA that its application for a Basel II waiver had been approved.⁹

Due to this approval, Northern Rock felt able to announce on 25 July 2007 an increase in its interim dividend of 30.3%. This was because the waiver and other asset realisations meant that Northern Rock had an "anticipated regulatory capital surplus over the next 3 to 4 years". (p. 25)¹⁰

The Basel II waiver, and the dividend increase this allowed to Northern Rock, allowed Northern Rock to weaken its balance sheet—in effect to pay

a dividend out of capital—at the very time when the FSA was concerned about problems of liquidity that could affect the financial sector.

Next we turn to Northern Rock's liquidity. Northern Rock operated under the Sterling Stock Liquidity Regulatory Regime,¹¹ which was introduced in 1996.¹² The FSA in its discussion paper outlined the purpose of the regime:

The objective of the regime is to ensure that a sterling stock bank has enough highly liquid assets to meet its outflows for the first week of a liquidity crisis, without recourse to the market for renewed wholesale funding, to allow the authorities time to explore options for an orderly resolution.¹³

Short-term liquidity stresses were well catered for; but this regime coped less well with “chronic” liquidity stresses of long duration.¹⁴

The demutualization of Northern Rock from a building society to a bank also changed the liquidity regime under which Northern Rock operated. Building societies are explicitly prevented from having as high a proportion of wholesale funding as did Northern Rock. When asked whether Northern Rock would have found itself in such difficulties if it had remained a building society, Adrian Coles, director-general of the Building Societies Association, replied, “Had Northern Rock stayed a building society, it may or may not have been a successful institution but it would not have come to the sticky end that it appears to have come to in the way that it has.” (p. 28)

Nor did stress testing of Northern Rock indicate the dangers. The FSA was aware of some deficiencies in the stress testing being undertaken by financial firms, acknowledging in particular that overall understanding of tail risk was weak. In May 2007 a review of Northern Rock's stress testing was undertaken as part of its Basel II waiver program. This review led to the conclusion by the FSA in July 2007 that the FSA were “not comfortable with [Northern Rock's stress test] scenarios”. (p. 31) Sants later stated that the FSA had pointed out to Northern Rock in July 2007 that it was “very unhappy with [Northern Rock's] stress testing scenarios and asked them to do ‘further distinct liquidity tests and scenario tests’ and give greater consideration to the impact of accelerated cash flows from a trigger event in a liquidity crisis”. (p. 31) In contrast, Applegarth, in an example of the confused communications between Northern Rock and its supervisor, identified the extra stress tests asked for by the FSA as “primarily to do with credit, such as the example . . . of the 40% house price fall”. (p. 31)

It is plain from a wide variety of evidence that Northern Rock's difficulties came as a shock to the Tripartite Authorities. This is not to say that they were not expecting problems—both the Bank of England and the FSA

had been giving warnings about underpricing of risk—but they were not expecting this particular problem.

The Northern Rock Crisis

Another Autumn Crisis

Soon after interbank and other financial markets froze on 9 August, it became clear that Northern Rock would face severe problems if the markets were to stay frozen for long. The then chairman and the then chief executive of Northern Rock first discussed these problems with each other on Friday 10 August. On the same day, the FSA contacted financial businesses it believed might be at risk from the freezing of financial markets. One of these was Northern Rock. Northern Rock replied to the FSA on the next working day, Monday 13 August, alerting the FSA to the difficulties that Northern Rock would face if the market freeze continued. Thereafter, the FSA and Northern Rock were in twice-daily telephone contact.

On Tuesday 14 August, the first discussions of Northern Rock took place between the tripartite authorities at deputy level—Sants, Gieve, and a senior treasury official (unnamed because no record was kept of who it was). The governor of the Bank of England was alerted on that day. On Wednesday 15 August, a more detailed conversation took place between the FSA and the treasury, and the chancellor of the exchequer was informed about Northern Rock on that day. On Thursday 16 August, the then chairman of Northern Rock spoke directly to the governor of the Bank of England and the possibility of a support operation was discussed.

On Wednesday 29 August, Sir Callum McCarthy wrote formally to the chancellor of the exchequer, indicating that the FSA believed that Northern Rock “was running into quite substantial problems.” (p. 36) On Monday 3 September, the Tripartite Committee met at the level of principals—the chancellor of the exchequer, the chairman of the FSA, and the governor of the Bank of England.

Between 10 August and mid-September, Northern Rock and the tripartite authorities pursued a threefold strategy to extricate Northern Rock from its difficulties. The three options they pursued were:

- Northern Rock resolving its liquidity problems through its own actions in short-term money markets and by securitising its debt;
- Northern Rock obtaining the “safe haven” of a takeover by a major retail bank;
- Northern Rock receiving a support facility from the Bank of England guaranteed by the government.

There was considerable overlap between the considerations of the three options. The prospects for a market solution through the money markets (including by securitization) were pursued until 10 September. The search for a private “safe haven” started on 16 August and continued until 10 September. The possibility of a Bank of England support operation was raised as early as 16 August.

*Did the Bank of England Provide Sufficient Liquidity
Assistance to the Money Markets?*

The first option, Northern Rock resolving its liquidity problems through its own actions, required there be no general shortage of bank liquidity. Some have claimed it was a failure on the part of the Bank to provide sufficient assistance to the money markets that forced Northern Rock to turn to the Bank for a support facility.

The banks chose to raise their reserve requirements by 6% in the maintenance period starting 6 September 2007. On 5 September, before the start of the 6 September maintenance period, the Bank of England announced that, if the secured overnight rate had not fallen from its higher than usual level above Bank Rate, the Bank would be prepared to offer additional reserves, amounting to 25% of the requested reserves target, before the end of the maintenance period. On 13 September, this criterion was met, and additional reserves were provided. An additional fine-tuning operation occurred on 18 September—following the run on Northern Rock—again offering £4.4 billion, or 25% of the reserves target.

Would the earlier provision of extra liquidity have saved Northern Rock? The chancellor of the exchequer pointed out that, despite the more proactive approach taken by the Federal Reserve and ECB, banks in the United States and Eurozone also got into difficulties:

[I]n the United States they did make money available. It did not stop three or four institutions from . . . I think in fact three or four institutions have actually had to close down in the United States and have been taken over by other banks. In Europe some of the smaller German banks got into difficulties. So it is not just a problem for here. (p. 43)

Defending the actions of the Bank of England, the governor was keen to explain that, contrary to the “myth” propagated by commentators, the actions of the ECB and the Federal Reserve were “all remarkably similar” (to those of the Bank of England):

[T]he European Central Bank has not increased the amount of liquidity at all since the beginning of August. . . . The amount of liquidity that we are

extending to the banking system is almost 30% higher. . . . Equally, the Federal Reserve has not raised the total amount of liquidity very much. (p. 43)

Explicitly dismissing the suggestion that a market-wide liquidity intervention could have assisted Northern Rock, King said:

You could ask whether the market could have been the lender of last resort for Northern Rock. I think the only circumstances in which that would have been feasible would have been when we had gone back to normal circumstances and banks had already financed the taking back onto their balance sheets of the conduits and vehicles that they now expect, over a period, to take back onto their balance sheets and were once again in a frame of mind to be willing to lend to others who had illiquid assets. (p. 45)

It does seem very unlikely that any *general* lending operation could have been of a sufficient scale to ensure that Northern Rock received the liquidity it required. Northern Rock was too special, its needs were too great, and too little was clear about its business model.

A Safe Haven?

On 16 August, Northern Rock began its pursuit of a “safe haven,” acting “behind the scenes” and with its advisers to encourage an offer for the company to be made. (p. 50) In accordance with its responsibilities under the Memorandum of Understanding, the FSA “encouraged and closely monitored discussions that took place between Northern Rock and potential acquirers”. (p. 51)

Two institutions showed an interest in acquiring Northern Rock. One only showed “a slight expression of interest . . . that never came to anything.” The second institution, which was a major high street retail bank, showed “more specific interest” for a period of two or three days, but no firm offer was made. Northern Rock ceased its pursuit of a “safe haven” on Monday 10 September. (p. 51)

While it is possible to conclude on the balance of probability that pursuit of a money market recovery solution to Northern Rock’s difficulties was more in hope than expectation, it is not possible to reach any conclusion at all about how realistic were hopes of finding a safe haven. There is a complete difference of view between the board of Northern Rock and the authorities.

The first conflict in evidence relates to the nature of the financial support required by the high street bank that considered an offer for Northern Rock. Applegarth implied on several occasions in evidence (to

the Treasury Committee) that the lending facility sought by the potential buyer was similar in nature to the support facility subsequently granted by the Bank of England to Northern Rock itself. Applegarth also indicated his belief that the Bank of England had refused the request for financing, and he strongly criticized the decision to refuse such financing.

The chancellor of the exchequer stated clearly that the financial support requested was in the form of a loan, which “could have been as much as £30 billion . . . to be given at commercial rates by the Bank of England”. (p. 51) The governor also described the request as one to “borrow about £30 billion without a penalty rate for two years”. (p. 51)

The chancellor and the governor also agreed that there was a legal barrier to the provision of financial support. The governor received legal advice that such lending on commercial terms would constitute State Aid under European Community competition law. Both he and the chancellor concluded that, were such lending to be made available to one high street bank, a matching facility would also have to be offered to other potential bidders.

In addition, the governor laid great stress on the legal difficulties faced in accomplishing a smooth takeover of a bank that is a quoted company:

The first way [the Bank of England] might have dealt with [the problems at Northern Rock] was to invite the directors of Northern Rock and prospective purchasers into the Bank or the FSA for a weekend to see if that could be resolved and a transfer of ownership agreed over the weekend such that the depositors in Northern Rock would have woken up on Monday morning to find themselves depositors of a larger and safer bank. That is not possible because any change of ownership of a quoted company—and Northern Rock is a quoted company—cannot be managed except through a long and prolonged timetable set out in the Takeover Code. (p. 52)

Applegarth however was firmly of the view that the initial stages of a takeover could have been accomplished more smoothly and could therefore have prevented a run. First, he said that the run “would not have taken place, in my view . . . if we had been able to announce an offer with a big retail brand.” (p. 53) He subsequently said:

Clearly it would have been impossible to get a completed transaction over a weekend, but it is my view that, had you had an announceable offer over the weekend with a major high street brand, that would have provided sufficient confidence so a run did not happen. (p. 53)

The governor of the Bank of England gave a somewhat different picture of what would have happened in such circumstances, drawing upon his

conclusion that any financial facility to one potential buyer would have to have been made available to other potential buyers:

The idea that if [the chancellor of the exchequer] stood up and said, “I am willing to lend £30 billion to any bank that will take over Northern Rock”—that is not the kind of statement that would have helped Northern Rock one jot or tiddle. It would have been a disaster for Northern Rock to have said that. (p. 53)

The FSA, the governor of the Bank of England and the chancellor of the exchequer all indicated that they actively sought or favoured a solution to Northern Rock’s problems prior to the run through a private sector takeover. But the chancellor of the exchequer concluded that, “as the days went by, it was increasingly obvious that people just did not want to know.” (p. 53)

The Support Operation

By Monday 10 September it was evident that a Bank of England support operation for Northern Rock would be necessary to avoid a default on its short-term borrowing such that Northern Rock was pushed into insolvency. On that day, Gieve spoke for the first time to the then chief executive of Northern Rock about the proposed facility.

By the following day, it was apparent that the operation would need to be publicly announced; doing so was both a legal and a stock exchange requirement. The succeeding days saw preparations put in place for legal agreement on the operation and for handling the announcement and its consequences.

It was initially decided to announce the support operation on Monday 17 September. Northern Rock’s plan was to use the time prior to an announcement on Monday to increase the bandwidth of Northern Rock’s Web site and to make other arrangements for handling customers and others affected by the announcement.

The plan to announce the support operation on Monday 17 September was only abandoned on the afternoon of Thursday 13 September. On that afternoon, according to the governor of the Bank of England, “rumours in the market started” in relation to the proposed operation. (p. 64) At 4.00 p.m. on that day, the Tripartite Standing Committee met at deputies’ level and decided to bring forward the announcement of the operation to 7.00 a.m. on Friday 14 September. The Court of the Bank of England met on the evening of Thursday 13 September. The terms of the emergency liquidity assistance were finalised in the early hours of Friday

14 September. The announcement was made at 7.00 a.m. that morning in the following terms:

The Chancellor of the Exchequer has today authorised the Bank of England to provide a liquidity support facility to Northern Rock against appropriate collateral and at an interest rate premium. This liquidity facility will be available to help Northern Rock to fund its operations during the current period of turbulence in financial markets while Northern Rock works to secure an orderly resolution to its current liquidity problems . . . The FSA judges that Northern Rock is solvent, exceeds its regulatory capital requirement and has a good quality loan book. (p. 64)

But before the provision of emergency liquidity assistance by the Bank of England to Northern Rock could be announced formally on the Friday morning, the outlines of the operation were reported by the BBC on the Thursday evening—at 8.30 p.m. on BBC News 24. Several witnesses to the Treasury Select Committee argued that this disclosure was instrumental in the run that followed.

In explaining the impact of the disclosure, both Ridley and Applegarth contrasted the impact of that disclosure with the likely impact of a planned announcement the following Monday. Ridley said:

Had the leak not happened and we had been able to announce on the Monday the facility with the Bank of England in a measured fashion, with full communication plans in place, undoubtedly there would have been some concern—a lot of concern—to many of our customers but we think it would have been considerably less than it was in the way that it came about. (p. 65)

Applegarth endorsed this view: “I think the chairman is right in that the probability of a retail run would have been lessened had we been able to do the announcement as we had intended on the Monday”. (p. 65)

Whether or not they are correct in that view is for present purposes immaterial; but their defense of it does indicate yet again how unprepared both Northern Rock and the Tripartite Authorities were to handle the episode.

The run on deposits of Northern Rock that took place between Friday 14 September and Monday 17 September became a central element in the problems that Northern Rock faced subsequently. The speed and extent of withdrawals meant that the Bank of England’s emergency facility, which had been envisaged as a “backstop” that would allow Northern Rock time to raise short-term funds in wholesale markets, actually needed to be called upon almost immediately. The run started on the evening of 13 September, following, in the chancellor of the exchequer’s words, “the fairly dramatic

news that a fairly well-known bank had gone to the Bank of England for help” and the run accelerated the following day. (p. 66)

At least two factors were at work. First, depositors were becoming aware that, were the run to continue, Northern Rock would eventually cease to be a going concern. Second, public awareness increased something of which many depositors might previously been unaware—namely, that deposits above £2,000 were not guaranteed in full.

In these circumstances, the governor of the Bank of England stated, the only way to halt the run was to provide a government guarantee of deposits in Northern Rock. The chancellor of the exchequer “became convinced” (p. 68) on Sunday 16 September that action along these lines was necessary. The announcement of the guarantee took place during a press conference after 5.00 p.m. on Monday 17 September; it was not made until then because formal agreement to the support had not been reached before the stock exchange opened and so the announcement had to be delayed until after market hours.

The announcement had the desired effect. The run was halted. Participants in the discussions surrounding the liquidity facility to Northern Rock emphasized the difficulty that they faced in predicting the effect of its announcement. Gieve told the Treasury Committee:

We knew when we did that that the announcement of that would have two effects: a good effect because it would show they had a new source of finance but a bad effect because it would send the market a signal that they really needed a new source of finance. In the event we knew that there was a risk that that balance would go the wrong way and it did. (p. 69)

Ridley also emphasized the unexpectedness of the run:

I think it is worth reflecting that all of us, both here and in the authorities, were surprised by the degree to which the announcement of a facility from the Bank of England—not the use of it but the existence of a facility—and the reassurances that went with it about us being a solvent and profitable business did not have a sufficiently reassuring effect on customers. (p. 69)

In view of the awareness apparent within the Tripartite authorities and within Northern Rock’s board that a retail run was one possible consequence of the announcement of the Bank of England’s liquidity support, the Treasury Committee asked witnesses from the Tripartite authorities about the extent to which a government guarantee—the device that was used on Monday 17 September to halt the run—had been the subject of prior consideration.

Gieve implied in his evidence in September that the possibility of announcing a government guarantee alongside announcement of the support facility was at least considered, and was consciously rejected. On the other hand, Sants did not attach great importance to the early discussions of a government guarantee: “I think I may have some vague recollection of it being mentioned by some working group discussion, but that is the extent of it.” (p. 70)

Whatever the extent of prior discussions, the governor of the Bank of England was firmly of the view that it would have been “irresponsible” to announce a government guarantee at the same time that the liquidity support was announced, commenting that, in such circumstances, “It would undoubtedly be said: ‘Why on earth is this being done?’” (p. 70)

Perhaps it would indeed have been “irresponsible” to announce the guarantee simultaneously with the support operation. But in view of the above statements that a run was seen as a distinctly possible consequence of the announcement, it is surely surprising that a guarantee was not planned at the same time as the support operation. Be that as it may, the idea of a government guarantee was given fuller consideration by the Tripartite Standing Committee at the level of deputies only after the retail run gathered momentum.

Why did the Authorities Provide Support?

By 14 September, in the situation when Northern Rock had started to borrow from the Bank of England, a run had started on Northern Rock, and the chancellor had on 17 September announced a guarantee of deposits there.

It is now useful to step back from this rather hectic series of events and review the range of possibilities considered by the authorities immediately before the loan facility was granted. These options—Northern Rock being able to refinance itself in the markets, a “safe haven,” or Bank of England support—all differed from the traditional response (whether we term this lender of last resort or provision of liquidity to money markets) in that they involve something that may be called, in one sense or another, a rescue.

The authorities could have behaved as they had in the nineteenth century. They could have considered whether the troubled institution was of sufficient importance that its failure would have damaged the reputation of London, as they did in the case of Barings in 1890, and if it failed that test, it would have been allowed to sink or swim, and liquidity provided to the rest of the banking sector as needed to calm any subsequent panic.

As is well known, Northern Rock was not allowed to sink or swim. There was a determined attempt to keep the institution going, and to find a rescuer for it. This can certainly not be justified by the size or reputation of Northern Rock. It was not a particularly large institution, and even its greatest admirer would not claim that it was a bank of international renown similar to that of Barings in 1890, one whose orderly failure might fundamentally damage the reputation of London. Why, then, did the authorities act as they did? We leave that question to other authors in this volume.

The Beginning of the End

The decision to provide support was not the end of the story. In February 2008 the bank was nationalized. What led to the nationalization decision taken over the weekend of 16/17 February is obscure. The government had been seeking buyers for Northern Rock. What was their authority to do so? The government was a large creditor, but this in principle gave them no more authority over the running of Northern Rock than had any other creditor. They were therefore acting as a “Shadow Director”.¹⁵

The Companies Act defines a shadow director as a person who instructs other directors what to do, and those directors follow his instructions. Individuals who act in this way are deemed to have the same duties and responsibilities as properly appointed directors.

This places the government in a strange position—for the duty of directors is to the shareholders. Were they acting in that way when they sought and then rejected buyers? Perhaps they were when they sought buyers, but whether they were when rejecting them may depend on the compensation terms the government offers to the shareholders. These are not yet revealed.

In any event, there were initially four expressions of interest—from Virgin Money, J. C. Flowers, the existing management of Northern Rock, and an ad hoc group led by a former chief executive of Abbey National. Immediately after Richard Branson of Virgin went on a trip to China with the prime minister, Virgin was declared the “preferred bidder”. Reasons were not disclosed. Then it was decided that no bid was good value to the taxpayer. (These grounds for rejecting the bids surely conflict with the government’s “Shadow Director” role.)

The company was then nationalized. An acting executive chairman, Ron Sandler, was appointed, along with Ann Godbehere as finance director. Sandler had helped restructure the Lloyd’s insurance market with considerable success, and had been on the board of National Westminster Bank when it had failed to resist a takeover by Royal Bank of Scotland.

Godbehere had in the past been finance director of an insurance company, and immediately before this appointment had, like Sandler, held some nonexecutive positions. On July 24 Gary Hoffman was appointed chief executive, allowing Sandler to become nonexecutive. Hofmann's previous appointment had been group vice chairman of Barclay's Bank, the third biggest bank in the UK.

Conclusion

In this chapter we have told the story of Northern Rock, from its beginnings as the merger of two building societies to its current situation as nationalized bank (one whose nationalization is still incomplete at time of writing, early November 2008). Three features of the story stand out. First, the bank had a very special business model, one that made it particularly vulnerable to a drying up of liquidity in money markets. Second, the regulators were completely unprepared for Northern Rock's difficulties. Third, the problems of Northern Rock revealed significant weaknesses not just in the implementation of financial supervision and regulation in Britain, but in the framework for that supervision and regulation. Changes are being considered to this framework at the time of writing. There can be no doubt that the effectiveness of these changes will be tested by the next banking disruptions; there can be doubt only about when these disruptions will be.

Notes

1. There were runs on some "fringe banks" in the secondary banking crisis of 1973–74. See Reid (1976) for details.
2. The first time we refer to an individual we give first name and surname, thereafter surname only. All quoted statements attributed to individuals are from the Treasury Select Committee Report on Northern Rock, as are the occasional unattributed phrase.
3. It should be noted that UK mortgage lenders including Northern Rock provide either floating rate mortgages or mortgages with rates of interest fixed from between two to five years; there is no issue of long term (20 year plus) fixed interest mortgages. As a result prepayment rates in the UK, unlike in the United States, are not sensitive to long-term rates of interest.
4. Unlike many other banks, Northern Rock did not make use of asset-backed commercial paper conduits as a source of short-term funding for the issue of mortgage-backed securities; until the autumn of 2007 all its mortgage-backed securities were sold rather than held off-balance sheet.
5. Some in the financial markets had foreseen these problems before the board of Northern Rock and before the regulatory authorities. Northern Rock's share

price started to fall from about mid-May, well before the share prices of the rest of the banking sector.

6. This was the £5,077 million September 17 issue of Granite series 07/03 securitised notes.
7. Before that date it had no formal responsibility for bank supervision, although it had, and had exercised, considerable informal influence.
8. FSA Handbook, BIPRU 1.3, "Applications for Advanced Approaches."
9. Northern Rock's Interim Results, for six months until 30 June 2007, p. 14.
10. *Ibid.*, p. 25.
11. Northern Rock Annual Report 2006, p. 51.
12. FSA, Discussion Paper 7/07, "Review of the Liquidity Requirements for Banks and Building Societies," December 2007, p. 32.
13. *Ibid.*
14. *Ibid.*, p. 33.
15. We are much indebted to Peter Gardner of Hansa Capital Partners for his guidance on the concept of a "Shadow Director."

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The Subprime Crisis, the Credit Squeeze, and Northern Rock: The Lessons To Be Learnt

*Maximilian J. B. Hall**

Abstract

On 14 September 2007, after failing to find a “white knight” to take over its business, Northern Rock bank turned to the Bank of England (“the Bank”) for a liquidity lifeline. This was duly provided but failed to quell the financial panic, which manifested itself in the first fully blown nationwide deposit run on a UK bank for 140 years. Subsequent provision of a blanket deposit guarantee duly led to the (eventual) disappearance of the depositor queues from outside the bank’s branches but only served to heighten the sense of panic in policymaking circles. Following the government’s failed attempt to find an appropriate private sector buyer, the bank was then nationalized in February 2008. Inevitably, postmortems ensued, the most transparent of which was that conducted by the all-party House of Commons’ Treasury Select Committee. (For a review and personal assessment of its January 2008 report see Hall 2008, pp. 26–32.) And a variety of reform proposals are currently being deliberated at fora around the globe with a view to patching up the global financial system to prevent a recurrence of the events that precipitated the bank’s illiquidity.

This chapter briefly explains the background to these extraordinary events before setting out, in some detail, the tensions and flaws in UK arrangements that allowed the Northern Rock spectacle to occur. None of the interested parties—the Bank, the Financial Services Authority (FSA) and the Treasury—emerges with their reputation intact, and the

policy areas requiring immediate attention, at both the domestic and international level, are highlighted. Some reform recommendations are also provided for good measure, particularly in the area of formal deposit protection.

Introduction

Of all the spillover effects from the US subprime crisis, the run on Northern Rock, the first in the UK for over 140 years, is by far the most transparent and worrying for the UK authorities. It exposed the tensions between central banks with respect to the appropriate line to be taken on the provision of liquidity support facilities, the difficulties inherent in the UK's "tripartite arrangements" for dealing with banking crises, defects in UK banking regulation/supervision, and the glaring flaws in UK deposit protection arrangements. It also revealed just how fragile the UK banking system actually is today, thereby shaking the complacency of politicians, bankers, and regulators alike and undermining confidence in the UK financial system, with potentially calamitous effects for the broader UK economy. For these reasons, it is extremely important to analyse why these events unfolded and what can be done to prevent a repetition.

The US Subprime Crisis: Spillover Effects for the UK

The downturn in the U.S. housing market, the connecting collapse in security prices associated with the subprime sector of the market (i.e., those securities, such as residential asset-backed mortgages [RABM] and collateralized debt obligations [CDOs], contaminated by defaults arising from "self-certificated" mortgages or mortgages otherwise granted on the basis of a high multiple of earnings or as a generous proportion [often 100% plus] of the market valuation) and the subsequent global loss of confidence in asset-backed securities (ABS) and other markets¹ have had ripple effects in the UK. The direct exposure of UK banks and other financial institutions, however, has been fairly limited.² But this has not allowed the UK financial system to emerge unscathed. The prime source of contagion has come through the international interbank market where banks have proved very reluctant to lend to each other, even at penal rates. This situation has arisen because of the banks' need to hoard cash to meet the contingent liquidity claims of their off-balance-sheet vehicles that now find they are unable to fund themselves in the traditional wholesale markets (e.g., the asset-backed commercial paper [ABCP] market) because of the uncertainty about their solvency, given their exposure to subprime securities. Additionally, given

the lack of transparency in the market place about where the subprime risks actually lie, and concerns about the likely scale of losses being nursed by prospective counterparties, mutual distrust has set in, causing the market to seize up. These severe liquidity shortages are reflected in abnormally high spreads between three months money and official Bank Rates, and have led to central banks around the globe providing additional liquidity to the markets through a variety of special funding initiatives (see Hall 2008, Table 1). Their intention is to limit the potentially wider damage that could be wrought upon the real economy as liquidity shortages give way to a credit squeeze and lending rates edge up and lending volumes fall, and not just in mortgage markets. Tighter liquidity can also threaten insolvency for institutions overexposed to the wholesale markets as a source of funds; and individual insolvency³ can soon spread to a wider community if depositor/investor panic sets in. Such then were the forces that were to wreak so much damage on the UK financial system and expose its inherent fragility.

The Northern Rock Crisis

The events leading up to and encapsulating the Northern Rock crisis are chronicled in Chapter 1 of this book (see also Hall 2008, Table 2). According to its midterm balance sheet for 2007, the assets of the UK's eighth largest bank and fifth largest mortgage lender stood at £113.5 billion at the end of June, with mortgages comprising £87.9 billion. Revealingly, only £30.1 billion of liabilities was represented by customer deposits; and shareholders equity amounted to £1.95 billion. The balance sheet starkly reveals the strategy of the bank that distinguished it from the other UK mortgage lenders. With only 72 branches to its name, its retail customer base was limited, causing it to rely heavily on wholesale markets for its funding.⁴ As an arch exponent of the "originate and distribute" school, Northern Rock's business model was to expand⁵ through the use of securitization (of its mortgage pool) and other secured borrowing. While such a strategy delivered an industry-beating cost-to-income ratio of around 30%, it always represented "an accident waiting to happen."

Investor concerns over Northern Rock soon came to the surface once the subprime turmoil hit the U.S. financial system, with astute investors correctly predicting the subsequent trading woes that were to hit Northern Rock as the interbank and covered bond markets ground to a halt. Massive short-selling of Northern Rock's stock—at one stage there was no physical stock left to borrow to facilitate such transactions—and an end-June profits warning saw the share price halve from its February 2007 peak. By August the bank knew the game was up, with no immediate prospect of the credit squeeze ending. As noted above, banks hoarded

cash in the expectation that they would be called upon to honor the contingent lines of liquidity previously agreed with their off-balance-sheet conduits, which were now denied funding,⁶ and due to uncertainty about where the sub-prime losses lie.⁷ Accordingly, it entered into negotiations with a number of potential buyers, duly keeping the Bank of England and the FSA fully informed. Failure to secure a firm bid,⁸ however, drove it into the arms of the Bank of England, with the latter announcing, on 14 September 2007 (the original intention was to make the announcement on 17 September but leaks on the impending announcement necessitated bringing the date forward), that it was providing an emergency line of credit to Northern Rock to allow it to continue operating. Following confirmation from the FSA that the bank was solvent, the decision to offer official assistance was taken to reassure the bank's depositors and prevent a wider systemic crisis. Under the open-ended facility (the original facility agreed on 14 September was replaced by a wider facility on 11 October), the bank is charged a (undisclosed) penal rate and is able to use mortgages and mortgage-backed securities and other assets as collateral to access the loan. The Bank, in turn, is indemnified against any losses and other liabilities arising from its support by the Treasury.

In the event, however, such action proved insufficient to reassure depositors—the mentioning of “last resort” funding appeared to induce just the opposite response—thereby threatening wider contagion. As a result, on 17 September 2007, the Treasury announced a full guarantee of all existing Northern Rock deposits in an attempt to stem the nationwide run on the bank, which had seen over £2 billion (later increased to over £12 billion) withdrawn in a matter of days, and restore financial confidence. The guarantee (which was extended to include existing and renewed unsecured wholesale funding on 20/21 September and covered bonds and derivatives not backed by mortgage collateral on 18 December—see House of Commons 2008a, pp. 131–132, para. 350 for further details) is due to last for as long as the current financial turmoil persists, and will be extended to other depositors if any further UK banks encounter similar difficulties. Thus, not only is Northern Rock continuing to operate as a commercial entity with a state guarantee, but the whole of the UK banking system's deposit base has now been effectively underwritten by UK taxpayers. The belated provision of the blanket guarantee duly caused the queues to disappear⁹ with the chancellor subsequently announcing, on 1 October 2007, an increase in the level of depositor protection to £35,000¹⁰ and a review of deposit protection arrangements (HM Treasury, FSA, and Bank of England 2007).

While all this was happening, the House of Commons' Treasury Select Committee held hearings into the affair, interrogating, in turn, the major protagonists. The first to endure their wrath and ire were senior officials

from the Bank of England, including the governor Mervyn King. The governor was asked, *inter alia*, to explain his *volte-face* on the provision of liquidity to the market (see below) and the background to the Northern Rock fiasco, and to give his views on the workings of the tripartite arrangements. Subsequent to this, senior FSA officials received a similar grilling but, while accepting that their monitoring of Northern Rock was, in some ways, “inadequate” (see below), they too refused to criticize the workings of the tripartite arrangements. Finally—the interrogation of the Treasury is considered below—senior Northern Rock officials themselves were hauled, and mauled, before the committee, but they offered few apologies for their actions arguing that their business model was a “good one,” their stress testing was “sufficient” and that they were the victims of “wholly unexpected events.”¹¹ They also suggested that, had the Bank been willing to extend the liquidity lifeline subsequently agreed for Northern Rock to a potential suitor (i.e., Lloyds TSB), the bank would not be in the position it finds itself in today. The Bank subsequently (on 17 October 2007) released a statement claiming that the suitor had demanded a penalty-free loan of up to £30 billion for a period of up to two years, something which the Bank argued could not be provided, even if it wanted to, given current EU rules on State Aid.

Implications for Central Banking and Bank Regulation and Supervision in the UK

What, then, do these events and revelations imply for central banking and bank regulation/supervision in the UK? Conveniently, analysis can be structured under three headings, namely, central bank liquidity provision and the lender of last resort (LOLR), the tripartite arrangements, and deposit protection arrangements, and each area will now be addressed in turn.

Central Bank Liquidity Provision and the LOLR

Conventional wisdom, as espoused long ago as 1873 by Walter Bagehot, suggests that, faced with a liquidity crisis, central banks should stand prepared to lend, at will, to banks, at a penalty rate of interest and against “good” collateral, until the crisis subsides.¹² The actions taken by the US Federal Reserve (“the Fed”) and the European Central Bank (ECB) in the second week of August satisfied these requirements apart from their failure to impose a penalty rate of interest on borrowers. The Bank, however, initially refused to offer additional liquidity to the market other than through

the “standing facility” under which banks can borrow (against eligible collateral), without limit, beyond their “target reserve balance” at a penalty of 100 basis points above the official Bank Rate, under the modifications to official money market operations introduced in 2006.¹³ The Bank’s stance was eloquently explained in a letter the governor sent to the House of Commons’ Treasury Select Committee on the 12 September 2007. While emphasizing the Bank’s difficulty in balancing the needs of (short run) financial stability against the fear that a wider provision of liquidity would “undermine the efficient pricing of risk” and hence long run stability, the governor went on to assert that proper management of “the current turmoil, which has at its heart the earlier under-pricing of risk . . . should not threaten our long-run economic stability.” Hence the reason for the Bank’s relatively sanguine approach. Additionally, the governor argued that to go further would only increase moral hazard and raise the likelihood and intensity of a future financial crisis. As he put it:

The provision of large liquidity facilities penalises those financial institutions that sat out the dance, increases herd behaviour and increases the intensity of future crises. . . . [And][t]he provision of greater short-term liquidity . . . would undermine the efficient pricing of risk by providing ex-post insurance for risky behaviour . . . encourages excessive risk-taking and sows the seeds of a future financial crisis.

In other words, a tough line is needed pour encourager les autres.

The first sign of the Bank retracting from this principled approach came on 5 September when, in addition to accommodating the UK commercial banks’ increased demand for target reserve balances—they increased by around six%, to £17.6 billion, compared with the previous month’s figure—it announced that it would allow the banks to bid for an additional £4.4 billion of cash the following week, *without payment of a penalty*, if overnight rates remained high. The move was designed to narrow the gap between secured overnight rates and the official Bank Rate (5.75%), which had peaked at around 75 basis points, and to stimulate interbank lending by increasing the banks’ liquidity cushion. Unlike the ECB’s earlier move on 22 August, however, it was not intended to influence the three months’ rate which, the Bank argued, was beyond their control, comprising both liquidity and credit risk premia. In the event, the full £4.4 billion was taken up by the market on 13 September.

Despite this action, the Bank was criticized in some quarters for not doing more to ease the market’s liquidity crunch. Buiters and Sibert (2007), for example, pleaded for the Bank to follow the example set by the Fed and the ECB and to extend the terms of its lending from overnight to at

least 30 days, and to extend the range of collateral accepted at the discount window or in its open market purchases, subject to appropriate “haircuts.” Finally, they argued for an extension in the range of eligible discount window counterparties. The inconsistency in central bank policy also led to the ludicrous situation of some UK institutions accessing the ECB’s more generous facilities through their EU offices (which Northern Rock could have done had it acted earlier to put in place the necessary legal documentation and collateral in its Irish branch); and some (e.g., HSBC) were even able to access the Fed’s facilities, through repurchase agreements, as designated “primary dealers” (Kane 2007).¹⁴ (For the more recent actions by the Fed and the ECB see Hall 2008, Table 1; and for a comparison with the Bank’s operations see Bank of England 2008, pp. 58–60.) Clearly, more international coordination is necessary on this front.

Having initially stood out from the crowd, the Bank was always on a “hiding to nothing” if unfolding events necessitated a change of tack. And, unfortunately for the Bank, just such a change was deemed necessary only two days after publication of the governor’s letter to the Treasury Select Committee. For, on the 14 September, following assurances given by the Financial Services Authority (FSA) that the bank remained solvent, the Bank provided emergency funding to Northern Rock. (Additional lending facilities were also made available on 9 October—see House of Commons 2008a, p. 127, para. 341.) The move was taken to allow the bank to continue operating, to reassure depositors of the bank, and to prevent wider contagion should a bank run spread. Under the arrangements, the bank has access to an unlimited amount of funding (subject to the provision of “suitable” collateral, which can now include mortgages and mortgage-backed securities) for as long as the turmoil persists,¹⁵ although a (unrevealed)¹⁶ penalty rate is imposed. By the end of December, the scale of the Northern Rock’s indebtedness to the Bank had risen to over £25 billion, the UK taxpayers’ total exposure had risen to over £55 billion (because of the extension in the Treasury’s guarantee), and there was no end to the bank’s plight nor the credit crunch in sight.

Subsequent to this, on 19 September, the Bank announced that it would, after all, lend to banks for periods of up to three months and against a wider range of collateral than hitherto (to include, as in the Northern Rock case, mortgages for example) under a new emergency facility. An initial £10 billion injection of cash, via public auction, was to be made the following week, with weekly auctions to follow thereafter until the market turmoil subsides. Unlike the Fed, however, the Bank (i.e., the Monetary Policy Committee) resisted the temptation to cut interest rates early, preferring to wait until the likely impact of the credit crunch upon the real economy, and hence future inflation, became clearer. This was not

deemed necessary until 6 December, when Bank Rate was cut by 25 basis points to 5.5%. And, following a further 25 basis points cut on 7 February 2008, the committee declined to cut rates again at its March 2008 meeting, citing concerns about the possibility of above-target inflation rates in the medium term, which duly materialised with the publication of a CPI figure of 3% for April 2008 on 13 May 2008. (By July 2008 it had risen to 4.4%.)

Given this remarkable volte-face in such a short space of time, it was inevitable that questions would be raised about the governor's judgment, thereby threatening to damage the credibility of the central bank.¹⁷ The first opportunity to cross-examine the governor in public came with his appearance before the Treasury Select Committee on 20 September, just a day after the announcement of the latest initiative. Lacking his usual self-assurance, the governor argued that changing circumstances necessitated a new approach. As outlined in a letter released the previous day by the Bank, the new policy stance arose "because the situation has changed—there has been a run on a bank . . . which threatened the reputation of the British banking system," and there is a need "to alleviate the strains on the longer-maturity money markets." He went on to argue that the volte-face was his decision (i.e., not taken under Treasury duress) and that the moral hazard created by the second initiative would be limited by the provision of a cap on the scale of funding the Bank proposed to supply, both in aggregate and to individual banks, and by the charging of a penalty rate of interest (of at least 100 basis points above Bank Rate).

With respect to the Northern Rock liquidity lifeline, the governor argued that his preferred course of action (not universally shared and deemed impractical by the FSA [House of Commons 2008a, p. 56, para. 123], although the chancellor has since announced he will consider revising the regulatory framework to allow for such a possibility and the Treasury Committee has endorsed its use in specified circumstances [House of Commons 2008a, p. 86, para. 215]) was a covert rescue operation by another bank, but this had been stymied by a series of legislative obstacles. Specifically, the Takeover Code, given a legislative footing in the Companies Act 2006 and the EU's "Market Abuse" Directive (2005) prevented a secret takeover; while the insolvency regime enshrined in the Enterprise Act 2002 (which requires the freezing of bank accounts in the face of insolvency, thereby delaying compensation to depositors) and the Financial Services Compensation Scheme of 2001 (which only provided full protection on the first £2,000 of a depositor's funds) conspired to make a nationwide run on Northern Rock rational.

While you have to have some sympathy with the governor's predicament, many argue that the governor's initial "high brow" approach was naïve and always likely to be overtaken by events. Moreover, his preferred

solution for handling the Northern Rock crisis has been openly challenged, even accepting the legitimacy of the legal advice he apparently received.¹⁸ Additionally, there are those who argue, including the senior management of Northern Rock, that had the Bank adopted the tactics revealed on 19 September much earlier in the day, like its counterparts in Europe, Northern America, and Asia, Northern Rock's very need for a liquidity lifeline would have been obviated; a clear case of "too little, too late." The Bank has since refuted the latter claim arguing that a "massive" injection of liquidity would have been necessary to achieve this result. Finally, the Bank has also rebutted the claim that it blocked Lloyds TSB's attempted takeover of Northern Rock, pointing out that it was, in fact, the chancellor (albeit with the agreement of the Bank) who took the decision.

Whatever the respective merits of their arguments, the Treasury Select Committee was unconvinced by the Bank's explanations¹⁹ and announced a formal enquiry into the Northern Rock affair, the results of which were published on 24 January 2008. Moreover, in the event, there were no takers for the newly proffered funds either at the auction held on 26 September or in subsequent weeks. Whether this reflected an underlying improvement in banks' liquidity positions, the costly nature of the funding or a reluctance by borrowers to be stigmatised by taking advantage of it, nobody is too sure. But it is clear some small banks still faced funding problems in the wholesale markets; and the market's appetite for the auction of three-month money announced on 12 December suggests that funds, at the right price, were still widely needed and that borrowers' fears of being stigmatised if they avail themselves of the special funding facilities may be waning. Indeed, this appears to be one of the positive outcomes of the coordinated central bank action announced on 12 December (see Hall 2008, tables 1 and 2), together with a narrowing of the spreads between three-month interbank rates and official rates, although some (e.g., Buiters 2007) regard the event as providing "empty gestures."

The Tripartite Arrangements

The so-called tripartite arrangements (Bank of England 1998) relate to the arrangements put in place in October 1997 to deliver financial stability by ensuring close cooperation and coordination between the interested parties (the Bank, the Treasury, and the FSA), especially in the event of a financial crisis, following the Labour government's decision to strip the Bank of responsibility for banking supervision (Hall 1997). The involvement of the Bank is necessary because of its continuing LOLR function and its responsibility for "maintaining overall financial stability,"²⁰ while the FSA's presence

is obviously required as the main regulatory/supervisory authority and the first port of call for any financial firm which gets into difficulties. Finally, the Treasury is primarily responsible for the international structure of regulation and the regulation that governs it, and has to be consulted if there is a perceived need for an official “support operation.” Basically then, in the case of the liquidity lifeline thrown to Northern Rock, the FSA’s role was to determine whether or not the bank was solvent, following an appeal for help from the bank; the Bank, as well as the FSA, had to determine whether its failure posed a systemic threat; and the Treasury, as keeper of the nation’s purse strings, had to decide, following the receipt of advice from the former bodies, whether to authorize a support operation.

Although both the FSA and the Bank²¹ were at pains not to criticise the working of the arrangements during their interrogations at the hands of the Treasury Select Committee, outside commentators took a different view. Moreover, the Treasury, in its evidence before the committee (given on 25 October), indicated that it would seek clarification, in a future draft, of its power to ultimately determine the outcome of Tripartite talks in a wider set of circumstances than it believes is currently covered by the agreements. (Should the Bank have bowed to FSA/Treasury pressure to provide additional liquidity earlier?) Additionally, like the Bank, it is keen that the central bank is involved more directly in the monitoring of individual banks’ financial health, notwithstanding the FSA’s broader remit in this area.

Intriguingly, the challenge to the tripartite arrangements posed by the Northern Rock episode suggests that one of the main reasons for separating monetary policy from banking supervision—to protect the integrity of the monetary authority in the face of inevitable bank failures (Hall 2001a)—may have been overplayed. This is because the handling of its residual role of LOLR is open to challenge, as in this case, exposing the Bank to a possible loss of credibility through this route. Moreover, there are those central banks who continue to argue (e.g., the Fed and the Bank of Japan, although they both have vested interests!) that continuing central bank involvement in banking supervision is essential, not least because it provides *direct* access to important market information that can prove invaluable in crisis situations. Would the Bank’s earlier knowledge of problems at Northern Rock have precipitated an earlier change of heart on its behalf?²²

Supervision by the FSA

As the body currently responsible for UK banking supervision, the FSA clearly had a number of questions to answer in relation to its treatment of Northern Rock, as it acknowledged before the Treasury Select Committee (FSA 2007b). First and foremost, given what the FSA now recognizes as an

“extreme” funding model where around 75% of its resources are accessed from the wholesale money market, why didn’t the FSA force Northern Rock to carry out a stress test for a market shutdown of the type which materialised in August? Did the FSA insist on additional safeguards being met given the bank’s clear violation of liquidity norms concerning the diversification of liquidity sources?²³ If so, what were they? Why didn’t the FSA know that Northern Rock had only secured \$2.3 billion of liquidity insurance (House of Commons 2008a, p. 17, para. 26)? Did the FSA ever raise with the management of the bank the wisdom of growing their mortgage book so rapidly in a maturing market? And why didn’t the FSA spot that Northern Rock was not only a “high impact” bank but also a high risk operation (an “accident waiting to happen”), requiring full scale reviews more frequently than every three years (the next one was due in 2009)?

Given their expression of concern earlier in the year about a possible tightening of credit conditions and the Bank’s similar public warnings, the conclusion must be that, in the case of Northern Rock, the regulator took its eye off the ball. Clearly, the regulation and supervision of bank liquidity will have to be looked at again and its importance raised to parallel that of bank capital adequacy assessment, the subject of years of development under the Basel II process (Hall 2004).

Deposit Protection Arrangements

The final area of controversy, admirably highlighted by the nationwide run on Northern Rock, concerns the operation of UK deposit protection arrangements. Although these were reformed back in 2001, their current operation under the guise of the UK Financial Services Compensation Scheme is still deeply flawed. As was pointed out long ago (e.g., Hall 2001b and 2002), this is due in part to the long-standing objection to the implementation of such arrangements by the clearing banks (Why should they, as conservatively managed organizations, subsidize their less conservative brethren?) and, more recently, to the introduction of the EU guiding Directive²⁴ on the subject. The latter, for example, placed restrictions on the use of deposit insurance information in advertisements (because of fears that this would distort competition), failed to mandate the risk adjustment of premium contributions and set the maximum period for depositor compensation at three months, in normal times, without suggesting a minimum. The first flaw means that very few people in the EU actually know about the existence of deposit protection until a crisis occurs, thereby destroying its potential as a stabilization device.²⁵ Moreover, once they become aware of the limited de jure protection they actually enjoy, they have every incentive to be at the front of the queue. The second flaw, meanwhile, results in cross-subsidies

occurring (as argued by the clearing banks) and a failure to minimize moral hazard (or excessive risk-taking) on behalf of the banks, thereby storing up future trouble for the banking system, as is only too well illustrated by the savings and loans crisis which struck the United States in the 1980s (Kane 1985). Finally, the third flaw means that, because of the excessively high liquidity costs imposed by the enforced wait for compensation, depositors again have every incentive to join in deposit runs, as again proved to be the case in the Northern Rock fiasco.

Of course, EU member states have always had the freedom to improve upon the Directive's arrangements, which only stipulated *minimum* requirements, but all too few have bothered. As regards the UK, for example, public awareness of the Scheme is (or was!) extremely low, risk-related premium are not imposed and compensation delays are likely to exceed the normal three-month maximum, because of our insolvency arrangements. Moreover, in an attempt to limit the moral hazard for depositors (i.e., to ensure they have an incentive to monitor, however difficult, the recipient banks) UK policymakers decided to apply the principle of coinsurance, only offering 100% protection on the first £2,000 of deposits, with the next £33,000 being subject to a 10% haircut. While this is desirable on efficiency and long-term stability grounds it is inimical to short-run stability, as the Northern Rock saga so clearly demonstrated. While the government's subsequent decision to do away with coinsurance may reduce the likelihood/intensity of future deposit runs, a more carefully thought out reform, addressing in particular the issues of moral hazard and agency/principal conflict (Hall 2002), is urgently required. This must also embrace a reconsideration of our insolvency arrangements, as the authorities recognise (HM Treasury, FSA, and Bank of England 2007, 2008c), and examination of the merits of linking deposit insurance arrangements to "prompt corrective action" type programmes, as is undertaken in the United States and Japan (Hall 1993). (See also Nieto and Wall 2006.)

The UK Authorities' Response

Response by the Bank of England

As noted earlier, the Bank has been widely accused of tardiness, at least compared with its central bank counterparts elsewhere in the world, in the provision of emergency liquidity to the UK banking system and of a lack of imagination in the conduct of its open market operations. It has also faced the charge of failing to coordinate its actions with those of other central banks and was ridiculed for its abrupt volte-face in September 2007 with respect to the terms on which it was willing to provide emergency

liquidity. The Bank's initial defense of its actions has also already been noted; its tardiness to act was driven, in part, by a desire to limit moral hazard, and due to a belief that the situation was manageable with traditional tools. Once it became clear, however, that the picture was darkening, and especially after Northern Rock's appeal for liquidity support, it acted decisively and imaginatively by extending the period for emergency lending from overnight to three months and widening the range of acceptable collateral beyond the traditional prime (i.e., with a minimum credit rating of "Aa3") public sector securities. (It subsequently introduced, in April 2008, a new "Special Liquidity Scheme" under which it is willing to swap up to £50 billion of Treasury bills for illiquid securities backed by mortgages or credit card loans for a period of up to 364 days—see Hall 2008, Table 2 for further details.) Moreover, it increased the flexibility of its reserve balance management regime, not least by widening the ranges around banks' reserves targets within which reserves are remunerated at Bank Rate. If this is perceived as an embarrassing *volte-face*, so be it. Additionally, as claimed by the Bank's governor before a hearing of the Treasury Select Committee on 29 November, the Bank can be shown to have been marginally more successful than the ECB, and certainly more successful than the U.S. Fed, in keeping LIBOR (London InterBank Offered Rate) rates close to policy targets; and its actions (accommodation of banks' increased demand for reserves was offset to only a small degree by short-term open market operations) resulted in a significant increase (i.e., over 42% between August 2007 and April 2008) in the cash reserves held by reserves scheme participants, unlike in the Eurozone and the United States. And finally, its willingness to tackle a perceived year-end funding problem and to participate in the coordinated central bank action announced on 12 December but agreed, in principle, at the G20 meeting held in November in Cape Town—involving a further widening in the range of acceptable collateral and a willingness to allow the market to determine the price of money, with no minimum rate applying—is evidence of its desire to refute the charge of aloofness. (But at the cost, as for other central banks, of diluting its own balance sheet quality and subsidizing the weak/reckless relative to the strong/conservative.) Whatever one's views on the strength of the Bank's defense, the Bank itself felt sufficiently concerned to announce a wide-ranging review of its money market operations on 18 December 2007.

As for its role in the decision taking of the Tripartite authorities, the Bank, again, has been accused of naivety, not least because of the governor's apparent attempt to shift the blame for blocking Lloyds TSB's takeover of Northern Rock on to the Treasury—at least that's how the market perceived the comments made in a television interview—and the apparent Bank

briefing that it was the Treasury which was mainly responsible for the delay in reforming the deposit protection arrangements. Away from this “blame game,” the Bank is supportive of a review of the tripartite arrangements and has no desire to retake responsibility for banking supervision.

Response by HM Treasury

As discussed earlier, the Treasury has already taken action to amend the deposit protection arrangements and to put in train, with the other tripartite authorities, a wider review of such arrangements. (Under the proposals announced by the FSA in November 2007 for adoption in April 2008, the Financial Services Compensation Scheme’s annual capacity to pay out depositors will increase from £2.7 billion to £4.03 billion, to be funded through *ex-ante* contributions from financial intermediaries.) Whether this results in a further increase (i.e., beyond the £35,000 limit introduced in October 2007) in the *de jure* level of protection enjoyed by depositors remains to be seen as, contrary to the chancellor’s public pronouncement, the British Bankers Association claims a further increase is unnecessary as the current level protects over 95% of customer deposits.

As for its participation in the “blame game,” the Treasury has made it abundantly clear that the decision to block Lloyds TSB’s takeover had the full backing of the Bank. Moreover, it is unaware of any overtures from the Bank, at least before August 2007, demanding immediate reform of the deposit protection arrangements.

Finally, and apart from its desire to improve the workings of the tripartite arrangements, the chancellor has aired his general views about the nature of desired reforms in an interview given to the *Financial Times* on 3 January 2008 (to the consternation of certain MPs!). He is looking for legislative reform to deliver the following: enable the FSA (rather than a newly created body) to intervene promptly in the case of a failing bank and allow it to seize and protect depositors’ cash in such a scenario; provide the FSA with greater powers with respect to the gathering of information, thereby allowing for effective liquidity adequacy assessment; and create a Cobra-style arrangement whereby the Bank and the FSA would advise the Treasury in crisis situations, but HM Treasury would possess the clear and unambiguous power to make the final decision. The formal tripartite proposals for reform were subsequently revealed in January and July 2008 in the shape of three consultation papers (see HM Treasury, FSA, and Bank of England 2008a, 2008b, 2008c). (For a review of the January 2008 document and a personal assessment of the proposals therein see Hall, 2008, pp. 33–46.)

Response by the FSA

Apart from endorsing the moves to reform the deposit protection, failure resolution, and tripartite arrangements, the FSA has also published a discussion paper reviewing liquidity requirements for banks and building societies (FSA, 2007c) in the light of its earlier acknowledgement of flaws in its assessment regime. A consultative paper on the subject, with firm proposals, is envisaged for mid-2008. It intends to develop UK policy in line with the international work being undertaken by the Basel Committee and the Committee of European Banking Supervisors, but currently envisages the continued use of some form of quantitative liquidity requirement and an intensification in the supervision of individual firms' stress testing and contingency funding plans as well as their off-balance-sheet vehicles. (Further insights into the need for reform are contained in Goodhart 2007b.)

Further to this work, the FSA is currently monitoring all wholesale and retail banks and deposit-taking institutions more closely under a continuing principles-based philosophy, while reviewing its risk-assessment and risk-mitigation practices. Its internal audit division also delivered a report on the lessons to be learnt from the Northern Rock affair, although the Treasury Committee much preferred an independent inquiry (House of Commons 2008a, p. 104, para. 268). The conclusions were subsequently made public (FSA, 2008).²⁶ And, finally, the FSA has already revealed a shake-up in its operating model (*Financial Times* 11 January 2008), partly in anticipation of the chancellor's demand for an enhanced role for the regulator in bank failure resolution policy and banking supervision more generally.

Wider Regulatory Issues

Apart from the parochial difficulties facing the UK authorities, there is a range of regulatory issues facing the wider international community (pre-March 2008 action is summarized in House of Commons 2008b, section 5). The perennial problem surrounding the operations of *rating agencies* is again to the fore, given the inherent conflicts of interest they face (e.g., they are paid by the issuers they rate rather than the investors they serve; and their consultancy fees can dwarf the ratings fees earned). With respect to the subprime crisis, the rating agencies have been castigated for not foreseeing the problem early enough, for not reacting quickly enough once higher than expected defaults arose, for making errors in their computer models, and for being so closely involved with their investment

banking clients in the structuring of complex, high-yielding securities (e.g., RMBSs and CDOs) so as to secure the “Triple A” ratings, which are required to attract investment from pension funds and others. While the agencies argue that they are only giving an opinion on the likelihood of default and/or likely size of expected losses, and caution that further due diligence is necessary on behalf of investors before making decisions, they have, nevertheless, admitted that some of their “opinions” proved wide of the mark and that some computing errors were made (i.e., in respect of the rating of “constant proportion debt obligations” [CPDOs]). Accordingly, most have moved to amend their ratings methodologies for subprime securities, and some (e.g., Moody’s) are considering adding indications of “liquidity” and “market value” to their usual credit ratings. (Other suggested improvements are contained in Bank of England 2007a, p. 57, and in House of Commons 2008b, section 7, pp. 67–74.)²⁷

Despite these developments, some investors are keen to test their apparent immunity from prosecution in the law courts; and many bodies, including the SEC (Securities and Exchange Commissions), IOSCO (International Organization of Securities Commissions), the European Community, the U.S. president’s “Working Group on Financial Markets” and the U.S. Congress, are currently embroiled in debates about what can be done to improve matters. (In May 2008, IOSCO unveiled a revised “code of conduct” for the rating agencies focussing on, inter alia, improving transparency and reducing potential conflicts of interest. In contrast, the EU Commission is seeking a tougher regulatory response—in the shape of a registration system and formal external oversight—while the SEC is seeking to reduce the extent to which ratings are “hard-wired” into regulatory rules and investment processes.)

The questioning of the roles and performance of the rating agencies conveniently leads into the second general area of concern, namely, the possible need to modify the *Basel II arrangements* for bank capital adequacy assessment. Apart from formally embracing the agencies’ ratings within the so-called standardised approach (Hall 2004), the banks’ widespread use of off-balance-sheet vehicles, such as “conduits” and “structured investment vehicles” (SIVs),²⁸ represents the latest form of “regulatory capital arbitrage” (Jones 2000) undertaken by the industry. While it is true that Basel II reduced the banks’ incentive to engage in such activities via securitization compared with Basel I, and that Basel II, unlike Basel I, does levy a capital charge against contingency risks (such as those arising from the provision of contingent liquidity lifelines to conduits), scope for regulatory capital arbitrage remains. Moreover, there may be a case for levying a capital charge against some off-balance-sheet activities even when legal opinion attests to the lack of a residual exposure, if only

to tackle reputational risk. Finally, given the failure of the banks' models to predict the recent subprime losses—the seizing up of the wholesale markets signalling, once again, the problems in dealing with fat-tailed distributions—the Basel Committee needs to look afresh at the whole use of models for setting regulatory capital charges. (The case for additional disclosure requirements is made in Bank of England 2007a, p. 61.²⁹)

The use of off-balance-sheet vehicles to reduce tax is another issue that requires scrutiny, as well as the more obvious abuses that have become apparent concerning the use of securitization to drive the banks' "originate and distribute" models. While securitization has long been regarded as a highly useful form of financial innovation that increases economic efficiency, with benefits for borrower and lender alike (Rosenthal and Ocampo 1988), and spreads risk, thereby reducing banking fragility, only now are policymakers waking up the problems posed by lack of transparency and complexity. No one is sure where the risks reside and too many end investors fail to appreciate the true nature of the risks they run because of the complexity of the products involved. Belated recognition of these problems has created fear and investor panic, resulting in the implosion of wholesale markets and the spread of the very contagion the innovation was designed to avoid. Possible solutions being considered are measures to ensure that those (including banks) who securitize assets retain an incentive to monitor their subsequent performance, greater scrutiny of both regulated and unregulated entities which originate loans (brokers' main concern is to maximize fees not the welfare of the borrowers),³⁰ and plans to ensure greater transparency and standardization in the industry. Pressure is increasing to force banks to reveal more about the conduits and other off-balance-sheet vehicles they have established, the performance of structured products, the composition of assets inside complex instruments, and the prices at which the securities trade in private. Likewise, hedge funds have to accept responsibility for disclosing more about their activities and exposures and possibly endure restrictions on their activities as a quid pro quo for the de facto support they are likely to enjoy in the event of a crisis (as proved to be the case with Long-Term Capital Management in the United States in 1998) as a result of their capacity to damage the banking and wider financial system.

In summary, the emerging consensus, for example, as outlined in Bank of England (2007a, section 4) and, more recently, in Bank of England (2008, pp. 12–14) and IMF (2008),³¹ is that the world needs to do more to address the weak points in the global financial system so cruelly exposed by the fallout from the U.S. subprime crisis. This requires, inter alia, measures to improve credit risk assessment, increase transparency, address weaknesses in banks' liquidity risk management practices and limitations in its

regulation, improve stress testing and contingency planning within firms to guard against extreme and correlated stocks, and to improve financial crisis management arrangements. Beyond this, and equally importantly, measures need also to be taken to ensure compensation packages secure a closer alignment between the interests of managers/brokers/traders on the one hand and those of shareholders/regulators/taxpayers on the other. With respect to bonuses, this will require design features seeking to address the predilection toward the creation of short-term gains and “tail” risks, suggesting the greater use of risk-related and deferred bonuses. And finally, the frequency and severity of financial crises might be reduced if “macro-prudential” policies focussed more on excessive credit growth and asset price inflation, as recently argued by the BIS (Bank of International Settlements) (BIS 2008).

Conclusions

While the level of UK financial institutions’ direct exposure to the U.S. subprime market was fairly limited, the shockwaves eventually transmitted through the international financial market place soon revealed stresses and weaknesses in the UK’s arrangements for handling financial/banking crises. The modus operandi of each of the main players involved—the Bank, the FSA, and the Treasury—has been called into question, along with the mechanisms in place for protecting depositors and ensuring coordination and cooperation between the parties involved in delivering financial stability. The nationwide run on Northern Rock served to highlight most of these deficiencies and the fragile nature of the UK banking system. The postmortems into the affair, not least that conducted by the House of Commons’ Treasury Select Committee, have served to focus minds on how best to deal with the evident shortcomings, and the authorities themselves have duly responded with proposals for reform; but a wider debate needs to be held into the best way to proceed. No less than the reputation of the UK financial system and its integral components is at stake, a highly disconcerting fact given the enormous contribution it makes to the health of the UK economy. The analysis and recommendations contained in this article are offered up as a contribution toward and stimulant of this wider debate that is urgently needed given the continuing threats faced by the domestic and international financial system.³² For, although the cumulative action of central banks around the world may well have eased liquidity conditions³³—albeit at the expense of a weakening in their own balance sheets—and reduced systemic risks, and despite some market signals³⁴ that the worst of the crisis may be behind us, there are sufficient grounds³⁵ for believing that we are not out of the woods just yet!³⁶

Notes

* An earlier version of this paper appeared in the *Journal of Financial Regulation and Compliance* 16, no.1 (March 2008): 19–34. And a full version of this paper is available at the Department of Economics' (Loughborough University) website (<http://www.lboro.ac.uk/departments/ec/Research.htm>).

1. The unfolding of these developments is well documented in Bank of England (2007a), at pp. 6–9, and explored in more detail in Goodhart (2007a).
2. This is reflected in the scale of UK bank write-downs on subprime-related business relative to those of their overseas counterparts. For further details see Hall 2008, tables 1 and 2.
3. The solvency of individual institutions is also adversely affected by the conservative write-downs called for by auditors wary of litigation post-Enron, further deterioration in structured finance markets, accelerating credit downgrades of CDOs, SIVs, and “monoline” guarantors and reintermediation following the consolidation of SIV balance sheets. For further information see Hall 2008, endnote 3, p. 54.
4. No other UK mortgage provider came near to operating a 75% / 25% wholesale/retail funding mix, with the Alliance and Leicester and Bradford and Bingley, the next most heavily dependent on wholesale funding, running ratios of nearer 50% / 50%. Ironically, this didn't protect them from speculators on the hunt for further victims, causing extreme volatility in their respective share prices.
5. Its residential lending in the UK rose by 55% in the first eight months of 2007 at a time of slowing house price rises. And its share of net new lending in the UK housing market rose to 19% by mid-2007.
6. The world's banking system is estimated to have around \$1.4 trillion of exposures to such conduits. Two of the worst affected Germany's IKB and Sachsen LB have already become casualties (see Hall 2008, Table 1) as their conduits' funding dried up.
7. Banks have been hit directly as a result of their own investments and indirectly because of failed syndications, the downward pressure on asset prices arising from investment vehicles' fire sale of assets and exposure to the leveraged buy-out industry.
8. The preferred solution of all concerned was an outright sale, preferably to a larger bank. Despite its relative attractions—low cost operator, better than average quality loan book, continuing access (but at penal rates) to the Bank's liquidity lifeline for as long as EU rules allow—however, formidable problems remained for potential bidders. The business was running at a loss (i.e., the yield on the mortgage book was lower than the funding cost). The bank's franchise value had been greatly reduced by the reputational damage caused. The scale of the funding burden (the Bank, which had already lent over £25 billion, would also have to be repaid) was enormous. And no one was sure how long the liquidity crunch would last for.

In the event, only two “approved” private sector bidders were left in the race following the withdrawal of the U.S. private equity group J. C. Flowers and Co. on 6 December 2007. This comprised the Virgin-led consortium, which had earlier acquired “preferred bidder” status, and the private equity firm, Olivant. Subsequent

to this, Olivant dropped out and Northern Rock's own management entered the fray. In February 2008, however, the government decided to nationalise the bank having deemed this a better "value for money" option for UK taxpayers. (For further details see Hall 2008, endnote 8, p. 54–55.

9. Ironically, some melted away faster than others, the laggards maybe doubting the word of ministers—not totally unsurprising given the previous chancellor's well-documented raids on pension funds and the limited restitution on offer to policyholders in the aftermath of the collapse of Equitable Life—or otherwise questioning the credibility of such a mammoth undertaking.
10. Under the UK Financial Services Compensation Fund protection was previously limited to 100% of the first £2,000 and 90% of the next £33,000, on a per customer per bank basis. Maximum protection has thus been increased to £35,000 from £31,700, and "coinsurance" (see text) no longer applies.
11. Notwithstanding the fact that both the Bank and the Treasury had prophesied just such an eventuality (i.e., of market liquidity squeezes and a tightening of lending terms) in their April 2007 "Financial Stability Report" (p. 47) (Bank of England 2007b) and January "Financial Risk Outlook" (FSA 2007a) respectively.
12. Noyer (2007) notes that such action is justified as it represents accommodation of an exogenous increase in demand for Bank money, arising from the temporary financial turbulence and uncertainty, rather than a change in medium term-oriented monetary policy.
13. Barclays Bank twice accessed such funding in the summer of 2007. Although borrowers in such situations are supposed to remain anonymous, its identity leaked out to the market causing Barclays furiously to deny that it was in need of an infusion of liquidity other than for technical reasons. Barclays' experience is likely to cause other banks to think twice before taking advantage of the facility, even if it were profitable to do so.
14. Moreover, Barclays and the Royal Bank of Scotland have since been granted (collateralized) access by the Fed to \$20 billion and \$10 billion of funding respectively under an emergency discount window facility designed to alleviate the problems of distressed U.S. securities customers of the banks' U.S. operations.
15. Although some argued a six-month limit may be operable under EU law on State Aid (the Treasury was looking toward a solution being reached by February 2008), a further six months of "restructuring" (as opposed to "rescue") aid may be possible.
16. The presumption is that a rate of at least 7% is being charged as this would be in excess of the penalty rate (6.75%) charged on drawings under the standing facility discussed earlier in the text. The size of "haircuts" being applied to the nonstandard collateral is unknown also.
17. To avoid such a situation recurring, some suggest that the governor should, in future, be restricted to serving one term of office.
18. Some dispute the advice (House of Commons 2008a, pp. 59–62, paras. 129–137), while others rightly ask why it took a crisis for the hamstrung nature of the surrounding legal framework to be revealed. Couldn't this have been ascertained earlier?

19. Some, as a result, wondered if there was something out there that the Bank had had forewarning of, but the market had not yet spotted.
20. The allocation of respective responsibilities under the “Memorandum of Understanding” was modified in March 2006, changing the Bank’s remit to one of “contributing to the maintenance of stability of the financial system as a whole.”
21. The Bank has since acknowledged that improvements in the Tripartite arrangements are required along with the other components of the crisis management arrangements (i.e., bank insolvency arrangements and deposit insurance arrangements) (Bank of England 2007a, p. 2). And the need for a review was acknowledged by the chancellor in his statement to the House of Commons on financial market instability on 11 October 2007.
22. Again, the Bank has since said that, although it does not believe it needs to take back responsibility for banking supervision, there may be a case for it to, once again, gather more information on individual banks.
23. Apart from asking for adequate diversification of liquidity sources, supervisors have long applied either a high quality liquidity stock requirement, designed to allow large UK retail banks to survive without one week of wholesale funding, or maturity mismatch limits (for all other banks) (Hall 1999, chap. 18). Clearly the former requirement, which was presumably applied to Northern Rock, would always have proved woefully inadequate in the event of a sustained seizure in the wholesale markets. (In its defence—see House of Commons 2008a, p. 15, para. 22—Northern Rock argued that it had sought to diversify funding sources both by product [i.e., retail deposits, covered bonds, securitisation, and wholesale deposits] and geography.)
24. The Deposit Guarantee Schemes Directive was adopted by EU member states in May 1994 for implementation by 1 July 1995.
25. The idea is that the mere provision of such arrangements helps obviate the need for their activation by reducing the incentive for individual depositors to precipitate or participate in a deposit run. If people don’t know of its existence they can’t possibly act in the presumed manner.
26. The FSA’s bout of “navel gazing,” reminiscent of the Board of Banking Supervision’s review of the Bank of England’s supervision of Barings plc (see Hall 1999, chap. 12), makes for painful reading. For a review see Hall 2008, endnote 26, p. 56.
27. The first rating agency to respond to the calls for reform was Standard & Poor’s, which revealed a set of reform proposals on 7 February 2008. The proposed reforms aim to tackle concerns about conflicts of interest (e.g., through the enforced rotation of analysts and monitoring of the track record of analysts who leave to work for issuers), the accuracy of ratings (through increased historic review), the remit of its analysis (trading liquidity and securities valuation may accompany the traditional default risk analysis), the transparency of ratings (e.g., “identifier” marks may be used to flag up new complex securitization processes and scenario analysis is likely to be more widely used), and investor ignorance (to be dealt with through enhanced investor education).
28. The conduits fund themselves largely by issuing ABCP and invest in highly rated, but high-yielding assets, such as CDOs. Once investors were spooked

by the valuation of CDOs, the ABCP market went into freefall. SIVs are very similar but are more highly geared. They typically lack the backup lines of liquidity enjoyed by conduits and invest more heavily in RMBS.

29. The Basel Committee's plans for strengthening the resilience of the international banking system in the light of the fallout from the subprime crisis are set out in Basel Committee, 2008a, 2008b, and 2008c. It plans to do this by boosting capital cushions, creating robust liquidity buffers, strengthening risk management and supervision, and enhancing market discipline through increased transparency.
30. As part of the Fed's reform of mortgage regulation in the United States, implemented in January 2007, some abusive practices are banned, including the offering of "no-documentation" loans and the extension of loans made without regard being paid to a borrower's ability to repay.
31. Both the Financial Stability Forum (FSF), representing major national supervisory authorities and central banks, and the Institute of International Finance (IIF), representing large banks primarily, also released reports in April 2008 outlining their proposals for reform. The former set of recommendations are summarised in Hall 2008, Table 3.
32. The Bank (Bank of England 2007a) has highlighted, in particular, the threats posed to the equity (this came to fruition with a global stock market crash on 21 January 2008 and renewed weakness in mid-July 2008) and commercial property markets and by a continued weakening in the external value of the US dollar, as well as the continuing threats posed to credit markets. Despite the subprime-related losses already revealed (see Hall 2008, endnote 2, p. 54) analysts believe further major write-downs need to be made before the crisis is over, with the G7 forecasting total global subprime-related losses may exceed \$400 billion and the IMF trumping this with a "guesstimate" of nearly \$1 trillion.
33. Although differentials between three-month LIBOR rates and policy rates remain uncomfortably high as concerns about counterparty risk give way to "hoarding," in part a response to continuing fears that accessing special central bank lending facilities will tarnish one's reputation in the market place. Hoarding by US banks, in particular, has placed additional strains on European banks now starved of dollar-denominated interbank funds, which their U.S. counterparts, until recently, had been willing to provide (funded, in turn, by U.S. money market funds).
34. For example, by mid-May 2008, bank share prices were generally recovering (in recognition of the fact that most—perhaps 80% or so, as argued by Fitch Ratings—of the losses on subprime-related assets had been written off with write-downs probably overdone, and in light of the recapitalization of the banking system), investors were cautiously returning to the mortgage-backed bond and distressed mortgage assets markets, and the costs of protecting against financial institution defaults in the derivative markets were falling sharply. A more sombre mood, however, had returned by July 2008. And, following the House of Representatives' rejection of the U.S. government's bailout plan (the "Troubled Asset Relief Programme" or TARP) at the end of September 2008, bank share prices tumbled yet again.

35. Residual fears relate to the continuing fragility of investor confidence following the collapse of Lehman Brothers in the United States—notwithstanding the Fed's provision of liquidity support to Bear Stearns, the FDIC's rescue of the Californian-based IndyMac bank, and the U.S. Treasury's takeover of the running of the government-sponsored entities Freddie Mac and Fanny Mae—the slowdown in major economies (e.g., UK/United States), which central banks are increasingly hamstrung from tackling because of the resurgence in inflation and which promises to raise bank losses on consumer and corporate lending at a time when credit conditions are already tightening, and further deterioration in housing conditions. The record fall in house prices in the United States in the first quarter of 2008 (by over 14% compared with a year earlier according to the S&P/Case–Shiller Index) foreshadows further subprime losses and rising repossessions, a situation matched in the UK housing market which continues to dog the prospects of UK mortgage providers. Indeed, with the FSA's blessing, the Nationwide Building Society announced, in September 2008, an impending merger with the Derbyshire and Cheshire Building Societies to prevent the possible failure of the last two mentioned from causing a wider crisis of confidence in the building society sector. And, in September 2008, Bradford and Bingley, the UK's eighth largest bank, was also nationalised.
36. Indeed, the half-year results for UK banks revealed in August 2008 portray a sorry picture of UK banking. Alliance and Leicester reported a collapse in profits to just £2 million, a few days after selling out to Santander Bank at a knockdown price. Lloyds TSB and HBOS both reported 70% plus falls in pre-tax profits, while RBS reported a half-year loss of £691 million after making a subprime related write-down of £5.9 billion. Meanwhile, Bradford and Bingley was subject to an FSA-orchestrated rescue and recapitalisation after experiencing (along with HBOS) a failed rights issue, prior to reporting a first half loss of £26.7 million. Finally, Northern Rock revealed a first-half loss of £585 million, threatening the taxpayers' investment in the bank.

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Northern Rock: The Anatomy of a Crisis—The Prudential Lessons*

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Abstract

This chapter attempts to analyze the main characteristics of the Northern Rock crisis and the responses of the Bank of England as lender of last resort (LOLR). On the basis of the diagnosis about the causes and the handling of this banking crisis we detect the shortcomings prevailing in the UK prudential device. We therefore try to draw the prudential lessons of this experience. As we cannot claim to present an exhaustive picture of the crisis's implications from a prudential point of view, we chose to focus instead on the points with practical significance far beyond the UK's case.

Introduction

In September 2007, the UK experienced its first bank run in over 100 years when Northern Rock encountered funding problems in rolling over its short-term debt. The bank's profile just before the crisis can be roughly described as that of an establishment primarily engaged in property finance activities: residential mortgage loans, commercial lending, personal loans, and insurance distribution. The group's lending activities mainly concerned the UK, whereas funding activities were carried out more globally. Residential mortgage loans were the core of its business and accounted for about 77% of total assets (Datamonitor, Company Profile, September 2007).

This chapter attempts to analyze the main characteristics of the Northern Rock crisis and the responses of the Bank of England as LOLR. On the basis of the diagnosis about the causes and the handling of this banking crisis we detect the shortcomings prevailing in the UK prudential device. We therefore try to draw the prudential lessons of this experience. As we cannot claim to present an exhaustive picture of the crisis's implications from a prudential point of view, we chose to focus instead on the points with practical significance far beyond the UK's case. That is why, despite the many criticisms already levelled at the Memorandum of Understanding (MoU), we do not analyze the deficiencies of the tripartite arrangements between the Treasury, the Bank of England, and the Financial Services Authority (FSA) because it seems too specific to the UK.

The Anatomy of a Crisis

An Extreme Business Model Lies at the Root of the Northern Rock Debacle

Northern Rock was originally a building society that demutualized in October 1997 and became a public limited company. This status change marked a radical change in the company's strategy. From late 1997 to the end of 2006, its consolidated balance sheet increased more than sixfold. Mr. Applegarth, the bank's chief executive officer says that Northern Rock's assets increased "by 20% plus or minus 5% for the last 17 years" (Treasury Committee Report 2008).

In order to sustain high growth in its assets, the bank changed the structure of its liabilities. In 1999, it indeed adopted an "originate and distribute model," whereby the bank originates loans or purchases them from specialized brokers and transfers them to a Special Purpose Vehicle (SPV) which then packages them into collateralized debt obligations (CDOs) for sale to other investors. "Granite," the Northern Rock's Vehicle was located in Jersey and provided around 50% of Northern Rock funding.¹

In order to meet its growth funding needs, Northern Rock turned to covered bonds as a new funding strategy in 2004. This type of securitization uses Limited Liability Partnership (LLP) rather than a SPV to fund assets and transfer risks. With this new financial method, the bank still holds the assets (as opposed to with SPV) and issues the covered bonds that are secured against them. For the investors, the advantage of such a financial product is linked with the fact that the LLP only comes into force in the case of default of the bank that has issued the covered bonds. So it is a more secure investment.

The counterpart of this rapid and huge growth in wholesale funding was a parallel decrease in the ratio of retail deposits in its funding. Thus,

as a proportion of the total liabilities and equity, retail deposits and funds declined from 62.7% in late 1997 to 22.4% at the end of 2006.

For the banking establishments that adopted it, one of the main advantages of the “originate and distribute” model is that in accordance with bank capital regulation, it allows bank to save capital, increase their lending portfolios, and thus sustain profitability. Yet, at the same time, securitization tends to reduce the bank’s incentives to screening and monitoring borrowers. So while securitization spreads risk, it also has a tendency to raise it. Theoretically, when a bank transfers loans off-balance-sheet, it will assume a loss of reputation if it fails to monitor those loans correctly or if it systematically overstates their quality. Investors who buy nonperforming CDOs will blame the bank that has set up the SVP. In fact, this reputation mechanism proves inefficient in offsetting the weakening of the incentives associated with the securitization of loans.

In its response to the Treasury Committee’s inquiry, the Building Society Association states that by relinquishing its Building Society Status, Northern Rock conduced to the permissive condition that allowed the adoption of its extreme business model. Indeed, the 1986 Building Society Act requires all Building Societies to attract at least 50% of their funding from members.² In practice, the wholesale funding of Building Societies in the UK is around 25% to 30%.

The Northern Rock debacle is, therefore, entirely due to the extreme business model of a mortgage bank that mainly funded its loan book on the wholesale market rather than from retail deposits and consequently created strong vulnerability to the market’s liquidity squeeze. Securitization at Northern Rock funded very fast growth lending. In the first half of 2007 lending went up 31% compared to the same period in 2006. The quality of the Northern Rock’s loan book obviously became a cause of concern—more specifically with regard to the quality of the lending that underpinned its excessive growth in early 2007—that probably contributed to the strong rationing it faced in obtaining wholesale funding in August. The similarity between the business model of the American subprime lenders and that of Northern Rock is of course one of the main reasons for Northern Rock’s collapse. Northern Rock had been a self-designated victim of the subprime crisis and of the subsequent rise in uncertainty, which caused an extended period of illiquidity. Indeed, the U.S. subprime crisis was initially a credit shock not a liquidity event. It quickly brought into question the value of a number of asset-backed securities and the related structured-credit products held by a number of financial institutions around the world. The uncertainty was partly due to the inherent structure of securitization that meant that the holders of asset-backed securities were not party to the information about loan

quality and the default rates to which the institutions that originated the loans had access. This uncertainty gave rise to market illiquidity in these financial instruments and then to funding illiquidity because of the way they were being financed. The timing of the liquidity freeze was disastrous for Northern Rock, which was low on cash since its last securitization had occurred in May, and it was planning another in September. Yet, even with better timing, the exceptional length of this liquidity squeeze would have caused funding problems for Northern Rock.

Despite several warning signals on the vulnerability of Northern Rock prior to its problems, its aggressive strategy of expanding its market share could be interpreted as a too risky behavior that resulted in the fall in its share price after the profits warning issued in late June 2007. Yet, the FSA remained passive in the face of the situation.

More importantly, the FSA not only ignored these alarming signals, but on 29 June 2007, it granted Northern Rock a Basel II waiver that authorized it to adopt an advanced approach to manage its credit risk. In fact, Northern Rock carried out all the stress testing exercises on which the bank and the FSA had agreed in the first half of 2007. Obviously, the possibility that the bank's funding sources could all dry up at the same time was not one of the considered scenarios. The implementation of advanced approach permitted it to use its own estimation of probability of default, loss given default, and exposure at default, and make its own calculation of effective maturity to meet capital minimum standards. The savings in capital provided by this advanced approach allowed Northern Rock to increase its interim dividend by 30.3%.

Crisis Management by the Tripartite Authorities

Until late July 2007, Northern Rock remained unaffected by the US subprime problems. Its rapid growth and dependency on wholesale market funding had little impact on the market's perceptions of its risk as a counterpart, measured by its CDS (credit default swap) spread. As previously observed, while Northern Rock's credit spread remained stable, its share price experienced a sharp decline from early 2007.

One major surprise in the summer of the 2007 financial turmoil was the amplitude and the rapidity of its transmission to the interbank market: the very "core" of the financial system. Two key events triggered the liquidity crunch and the market disruption of August 2007.

On 2 August, it became public that the IKB's³ financial situation was greatly deteriorated by its US subprime loans' exposure. One week later, on 9 August, BNP Paribas announced that the quotation of three of its funds needed to be suspended for similar reasons. Following those

public disclosures, the interbank market came under extreme strain. Northern Rock's CDS spread began to rise while its share price weakened further.

The global deterioration in credit and money market conditions had been closely monitored by the Tripartite Authorities. Indeed, in the UK, financial stability is to be achieved through a MoU that establishes a framework for cooperation between the Treasury, the Bank of England, and the FSA. This MoU sets out the role of each authority and codifies how they have to work together. So, this Tripartite arrangement is based on the division of responsibilities between the Bank of England, which has to contribute to the preservation of the financial system's stability as a whole, the FSA, which is endowed with the responsibility of authorizing and supervising individual banks since the 2000 Financial Services and Markets Act, and the HM Treasury, which is responsible for the institutional structure of the financial regulatory system.

The main problem with this arrangement is the partition between the supervision (FSA) and the lender of last resort functions (the Bank).

According to the Treasury Committee's report, between 10 August and mid-September, Northern Rock and the Tripartite Authorities essentially implemented a threefold strategy to alleviate the financial difficulties faced by Northern Rock.

The three options pursued were as follows:

- Northern Rock tried to resolve its liquidity shortage by its own actions in short-term money markets and by securitizing its debt
- Northern Rock tried to favor a takeover by a major retail bank
- Northern Rock received a support facility from the Bank of England guaranteed by the government.

The three options were highly intertwined.

The first option during the period from August to 10 September aimed to resolve the Northern Rock liquidity crisis through the short-term money markets. The underlying idea was that the Bank of England's money market operations might restore liquidity in the short-term markets and thus helped Northern Rock to liquify its assets through securitization. In August, just to alleviate their liquidity problems, banks asked the Bank of England to modify the characteristics of its liquidity injections. They pleaded for central bank's lending at longer maturities, to avoid the penalty rate and/or an increase of the range in the collateral at which it accepted to lend.

On 12 September 2007, the Bank of England refused these requests. The decision was justified by two main arguments. On the one hand,

the money market reform's objectives had been to give the banking system more flexibility in managing their liquidity and therefore improve the ability of the Bank of England to inject liquidity into the banking system in both normal and stress conditions. So, according to the Bank of England, the banking system should eventually be able to build up liquidity in those markets. More precisely, with the reform of the UK's money market operations, banks set their own reserve targets each month, at the beginning of the maintenance period. The Bank of England then supplies the reserves requested by the banking system as a whole. The objective is to allow banks to deal with their own day-to-day liquidity needs and to supply in aggregate the banks' demand for reserves so as to keep the overnight interest rate close to the Bank Rate set by the Monetary Policy Committee. So, if an individual bank has misjudged its reserve target and finally needs additional liquidity, it can obtain it through standing facilities against eligible collateral at a penalty rate of 1% above the Bank Rate. On the other hand, the refusal to agree with the banks' suggestions is justified by the moral hazard generated by such softening of the Bank's operational liquidity injection conditions.

Consequently, the Bank of England decided first to intervene in the markets by injecting liquidity but only in the overnight interbank market. More precisely, the Bank of England proposed to provide banks with liquidity during the maintenance period,⁴ which started on 6 September 2007.

Such a lack of reactivity and adaptation to the new market conditions can be interpreted as a policy mistake. Indeed, the Bank of England's collateral requirements were stricter than those of the Fed (U.S. Federal Reserve) and the European Central Bank (ECB)'s. Thus, by only accepting UK government, European Economic Area government securities or, a few international organizations' debt like the World Bank's, and under special circumstances, US treasury bonds in exchange of liquidity provision, the Bank of England, in reality, merely accepted to lend against securities that were already liquid. Concerning Northern Rock, this intervention through the maintenance period proved inefficient because Northern Rock had very little collateral eligible by the Bank of England. Thus, the Bank of England strict collateral policy prevented Northern Rock from resolving or even mitigating the problems that affected it. To overcome the liquidity squeeze, the Bank of England ought to lend against illiquid collateral and for longer periods through its discount window or maintenance period.

The contrast between the Bank of England inertial behavior and the reactivity of the other central banks is impressive. Thus, on 17 August, the Fed changed its usual practices and allowed the "provision of term financing for as long as 30 days, renewable by the borrower". Moreover, the board

approved a 50 basis point reduction in the primary credit rate to narrow the spread between the primary credit rate and the Federal Open Market Committee's target federal funds rate to 50 basis points. These changes were presented as "designed to provide depositories with greater assurance about the cost and availability of funding" (Board of Governors of the Federal Reserve System, Press release, 17 August 2007).

Meanwhile, the European Central Bank modified the time pattern of its supply of funds to overcome the tensions that then occurred in the euro money market. Furthermore, in response to the unusually high spreads in the euro market between the overnight rate and the ECB's policy rate, the ECB reinforced its supply of credit for the August maintenance period and thus injected £94.8 billion on 9 August. This option, in association with other operations, allowed the return of overnight rates to the policy rate in the following weeks.

So, contrary to other central banks that adapted their interventions on money markets to the exceptional dysfunctioning of the interbank markets caused by a sharp crisis of confidence, the Bank of England did not adopt emergency measures and refused to meet money demands.

Concurrently, a solution involving the private sector was being considered. Thus, between 16 August and 10 September, Northern Rock, began discussions with potential acquirers with the assistance of the FSA. But, as markets' turmoil was going on—for an unspecified period of time—and since Northern Rock suffered from an enormous lack of liquidity, all the offers received requested financial support. With regard to its official mission to fight against moral hazard, the Tripartite Authorities refused to grant it. For instance, Lloyds TSB, a major retail bank asked the Bank of England for £30 billion loan without penalty rate for two years to take over Northern Rock. Such a request was justified by the £113.5 billion needed to finance Northern Rock's balance sheet in consideration of the reputation prejudice which would have generated losses for the potential acquirer (*Financial Times*, 26 October).

Among the reasons against financial support to a potential acquirer, the Tripartite Authorities argued that it could not be granted to a private retail bank because it would be considered as State aid, which is forbidden under the European Community's competition law. Nevertheless, it must be observed that the relative slowness of the takeover process was also an obstacle to the success of the private option. In the takeover process of a quoted bank, it is legal that the authorities in charge of the operation give shareholders enough time so they can consider various offers. During this period, the bank is exposed to the depositors' suspicion that can worsen its difficulties. This is partly due to the nonexistence of a special insolvency regime dedicated to the treatment of weak bank in the UK.

Given the lack of repurchase proposals, Northern Rock ceased its search for a potential acquirer on 10 September. On 13 September, noting the failure of the two previous rescue options for Northern Rock and considering that there was a risk of contagion to the whole banking system, the chancellor of the exchequer decided to grant Northern Rock a liquidity support facility. This emergency liquidity support was perceived as necessary to avoid other banks depositors to lose confidence in the banking system as a whole. In keeping with the Bagehot's classic doctrine of lender of last resort, Mervyn King, the governor of the Bank of England, wrote to the Treasury Committee on 12 September 2007: "Central banks, in their traditional LOLR role can lend 'against good collateral at a penalty rate' to an individual bank facing temporary liquidity problems, but that is otherwise regarded as solvent."

The Liquidity Support Facility was closely related to this conception of LOLR. Indeed, it consisted in providing liquidity to Northern Rock against a range of collateral wider than that defined in the standing facilities so the bank could fund its operations during the turmoil period in financial markets, although always at a penalty rate. The penalty rate was justified by moral hazard, as it was supposed to induce a more cautious behavior in the bank's management of its liquidity risks in the future. The exact terms on which this financial support was made available, or the method for valuing the collateral were never disclosed.

On 13 September, namely, prior to the Bank of England's official announcement on 14 September, rumours about the emergency liquidity support facility to Northern Rock started to spread in the markets and the BBC commented on the operation. This premature disclosure of the Bank of England's support stigmatized Northern Rock. Its depositors perceived the emergency liquidity facility as a confession of the bank's dramatic financial situation, and it was not viewed as mere support to a solvent institution facing a liquidity problem. Poor communication worsened the situation and contributed to the bank's stigmatization.

The deficiencies of the UK's Deposit Insurance Scheme⁵ added to the stigmatization process triggered of a run on Northern Rock's deposits between Friday 14 September and Monday 17 September. During this run more than £2 billion of assets were withdrawn from the bank. The run exacerbated Northern Rock's difficulties and overcame all its efforts to consolidate and redress the situation.

Mervyn King, in his testimony to the Treasury Select Committee (20 September 2007) said that he would have preferred to grant covert aid to Northern Rock without the public being aware of the Bank's intervention but that would have been illegal because of the 2004 Market Abuse Directive (MAD) which acted as a barrier to covert support operations.

Indeed, Northern Rock was supposed—as all listed companies—to conform to MAD’s article 6 that provides that member states ensure that issuers of financial instruments inform the public as soon as possible of all inside information of direct concern to them, and that was indeed the case with the emergency liquidity support. Nevertheless, article 6 also states that “an issuer may under his own responsibility delay the public disclosure of inside information . . . so as not to prejudice his legitimate interest provided that such omission would not be likely to mislead the public and provided that the issuer is able to ensure the confidentiality of that information.” This means that MAD gives flexibility to cope with exceptional circumstances. It was all a matter of interpretation.

In order to stop the bank run, the chancellor of the exchequer announced the provision of a government guarantee on Northern Rock’s deposits on Monday 17 September. This guarantee referred to “all existing deposits at Northern Rock” and was set for the duration of “the current instability in financial markets”. The guarantee’s announcement provided Northern Rock with £20 billion of emergency funding so the bank could meet its liabilities and put an end to the run. After the bailout, Northern Rock engaged in negotiations with private potential acquirers.⁶ These negotiations were unsuccessful. So, on 17 February 2008, the British government decided to nationalize the bank as it officially claimed it felt obliged to protect British taxpayers’ interests.

According to Willem Buiter,⁷ until Northern Rock’s “nationalization,” the Bank of England lent the bank about £25 billion through the Liquidity Support Facility, and the government’s total exposure to Northern Rock was at the time of nationalization in the order of £60 billion. This amount includes the government’s guarantee on all retail deposits but also that on wholesale deposits and on most of the unsecured debt other than subordinated debt and other hybrid capital instruments.

The Prudential Lessons

Northern Rock has been an archetypal case of the drift of the “originate to distribute” model. In the extreme case of Northern Rock, for £1 in collected deposits, £3 were lent, so on the liability side, Northern Rock was hugely exposed to the risk of disruption in wholesale markets. Conversely, in the traditional “originate and hold” banking model, banks transform, extend maturity, and create liquidity: banks’ liabilities are short term and mainly comprise deposits that are repayable at par on demand, whereas their assets are longer term and largely nonmarketable. This last characteristic is directly linked with the highly private information contents of bank loans compared to market financing.⁸ That is why bank assets are widely perceived

as more opaque than those of most nonbank firms. In normal times, the association of these two banks' balance-sheet features does not generate problems, but if there is a weakening of confidence in the bank's ability to meet its payments obligations, it can cause a massive withdrawal of deposits (conversion to cash or transfer to other banks) and hence a liquidity problem with the difficulty of selling off assets at a "normal price" (fire sales), and it may also threaten the bank's solvency. As we already know, deposit insurance constitutes a solution to protect small depositors and avoid bank runs (Diamond and Dybvig, 1983).

The Shortcomings of the UK Deposit Insurance Scheme

Paradoxically, despite a weak dependence of the Northern Rock financing model on deposits collection, the liquidity problem faced by the bank not only took the form of a drying up of market financing, but it also materialized as a bank run, even though the mere existence of a deposit insurance scheme is theoretically sufficient to prevent such a bank run. This episode reveals that the UK's Deposit Insurance Arrangements—which have been in place since 1982 and revised in 2001 with the creation of the Financial Service Compensation Scheme (FSCS)—were not properly designed. They did not prevent the formation of long queues outside Northern Rock branches. What were the structuring problems of this Deposit Insurance Scheme?

Prior to 1 October 2007, the FSCS would cover 100% of the first £2000 of deposits but only 90% of the next £33000. Therefore, UK deposit insurance only pays out a maximum of £31700 to any one individual with a protected claim. This coinsurance device was initially adopted after the collapse of BCCI in 1992.⁹ The idea that a person insured should share some of the risk is very common in general insurance contracts. The rationale for the mechanism in deposit insurance schemes is to create incentives so depositors monitor their banks. It is therefore conceived as a principle for a reduction in moral hazard on the depositors' part. Nevertheless compared to other creditors, small depositors need stronger protection because a large proportion of them have limited financial means and expertise. If we admit the lack of small depositors' means and skills to efficiently assess the financial strength of their banks, the rationale for coinsurance disappears. Indeed, coinsurance is a mechanism adapted to insurance contracts, whereby the individual bearing the deductible can reduce the risk and so the probability to lose money, because of a change in his behavior. That is typically not the case for small depositors. In that instance, it was just an incentive to run. Moreover as underlined by A. Campbell and D. Singh (2007), coinsurance also presents an added problem, namely, that many depositors will not

have their claims paid in full and will therefore continue to be creditors of the failed bank. In case of liquidation, these residual depositors' claims will complicate and increase the costs of the winding-up process.

In the EU, the Deposit Guarantee Scheme Directive (DGSD) provides the basic framework for the structure of how deposit insurance guarantees have to be designed; it permits but not requires coinsurance of liabilities. Several European countries' deposit insurance schemes integrate coinsurance mechanisms.¹⁰ The Northern Rock experience pleads in favor of a modification of the DGSD prohibiting coinsurance scheme.

As previously observed, small UK depositors could suffer losses in the value of their deposits (credit losses) because of coinsurance,¹¹ but they can also suffer liquidity losses because they do not have access to their deposits until the winding up of the judicial process. So, it could take months if not years until the depositors of large failed institutions can be reimbursed. As shown by R. Eisenbeis and G. Kaufman (2006), the delayed access to or the freezing of deposit accounts could be assimilated to a forced transformation of demand and short-term deposits into longer-term deposits or even bonds. The inability to promptly mobilize deposits to make payments constitutes a great source of inefficiency in the payment system. Liquidity losses for depositors may be strongly reduced or even eliminated by appropriate provision in the banks' bankruptcy regime. We have to note that under EU legislation, compensation to depositors should be made within at least 90 days, an extension to six months is tolerated in exceptional circumstances. So, once again DGSD could be analyzed as insufficiently constraining.

Even with a high level of compensation and without coinsurance, it would still be rational for depositors to withdraw their deposits from a financial distressed bank if there were strong uncertainty about repayment delays. The funding model of the UK Deposit Insurance Scheme also has to be discussed. Indeed, an inadequate funding system can lead to increased delays in resolving failed banks and to a loss of credibility in the Deposit Insurance Arrangements. There are two polar cases for funding arrangements: *ex-ante* or *ex-post* funding.¹² *Ex-post* or "pay-as-you-go" funding requires member banks to pay premiums only after a failure. The motivation for such a funding device is to stimulate interbank monitoring. Nevertheless it presents strong disadvantages: it limits the ability of the Deposit Insurance to promptly payout insured depositors and it is procyclical because it levies contributions precisely at the time when banks experience a period of financial distress and suffer tighter capital constraints. Moreover, failed banks do not contribute to the cost of deposit insurance. On the contrary, *ex-ante* funding refers to the accumulation of reserve prior to the distress episode.¹³ It could be designed in such a way so as to smooth out the amount of premiums paid by banks over the course of the

business cycle and could thus alleviate the pro-cyclical problems previously underlined. Furthermore, all the member banks contribute to the funding, including those that subsequently fail. The FSCS has been referred to as ex-post funding. During the course of the Treasury Committee inquiry (2008),¹⁴ the British Bankers' Association (BBA) and the Building Societies' Association (BSA) recognized that the FSCS was designed to deal with losses of up to £4 billion. Therefore, if a bank or Building Society were to fail and the potential losses to depositors exceeded £4 billion, the government would need to fund the shortfall to prevent net losses to depositors. So, there was a clear recognition from these two professional associations that the risk of large-scale bank failure was underwritten by the taxpayers and not by the banking community through deposit insurance schemes.

So the UK Deposit Insurance Arrangement cumulated the incentive for bank runs: coinsurance, liquidity losses due to long reimbursement delays, and ex-post funding that reinforce the payout delays. Such shortcomings are not specific to the UK, they are also permitted by the Deposit Guarantee Scheme Directive. So the lessons of the Northern Rock's experience have to be enlarged to the EU Deposit Protection legislation that must reinforce its requirements on national schemes.

The Arguments in Favor of a Special Bank Insolvency Regime

Bank failures are different from that of other companies in many important aspects that can be mobilized to justify the exemption of banks from general corporate insolvency law and their subjection to administrative insolvency proceedings under the control of regulators. Empirically, bank liquidations are rare¹⁵ compared to the frequency of bank reorganization. This may be interpreted as an evident sign of the specificity of the banks' bankruptcy process.

A large proportion of the arguments in favor of a special treatment of banks in insolvency proceedings deals with the justification for stronger regulation in the banking sector compared to other commercial or industrial sectors. In some ways, banks and building societies can be assimilated to utility providers, and the UK already has special administration regimes for the energy, water, and railway industries. These ensure that crucial services to customers remain secure and continuous in the event that company providing those services becomes insolvent.

Why are banks special and may need a special insolvency regime?

- Bank deposits collectively comprise the largest share of the country's money supply and its primary exchange medium. So, banks' liabilities are the most usual medium of exchange.

- Banks perform financial services that are fundamental to the smooth functioning of the economy such as the extension of credit especially to those agents who cannot find alternative funding sources,¹⁶ which includes deposits taking and payment processing. Banks remain the primary source of liquidity for most financial and nonfinancial institutions. So, potentially, bank failures can cause credit rationing, a substantial reduction in economic activity and eventually, a spiral of commercial failures in the worst cases. Thus, the knock-on effect does not only disturb the financial system through exposure and the informational channel but also the commercial and industrial sectors as well, through the credit channel.
- Bank insolvency may entail a risk to the entire economic and financial system by a propagation process from the defaulting bank's counterparties or by the informational channel. The exposure channel relates to the potentiality of "domino effects" through real exposure in interbank markets and/or in payment systems, whereas the informational channel has to do with the lack of information on the mutual exposure of banks and on the type of shocks¹⁷ affecting banks that can generate contagious withdrawals by noninformed depositors.

The arguments previously presented are traditionally used both to justify stricter regulation for banks compared to other companies and to advocate a special bank insolvency regime. Nevertheless, there are also other specific arguments calling for special treatment.

The insolvency concept is quite different for banks compared to other companies because the regulator is vested with a central role in the insolvency proceedings. Different reasons can explain this specificity:

- First, under general insolvency law, the trigger point for intervention is the default of the debtor's institutions on their liabilities on due date. Because of banks' balance-sheet specificity, such inability to meet a short-term liability is not necessary a proof of insolvency but can simply result from a temporary shortage of liquidity. By contrast, and still because of the peculiarity of its balance-sheet, which provides an on-going source of cash flow, a bank experiencing financial difficulties can continue to honor the payments of its debts in a financial system endowed with a well-designed deposit insurance even though the bank may be potentially insolvent. As they are subject to the special regulations that condition their operations, banks benefit from special proceedings that define their viability. The bank supervisor assesses the adequacy of the bank's capital; he judges the quality of its assets and it is his prerogative to determine

the point of insolvency. As remarked by Eva Hüpkes (2003), “a bank is insolvent when the supervisor says it’s insolvent!” As per most general corporate bankruptcy codes, bankruptcy may be initiated either by a minimum number of creditors whose claims are in default or by the firm itself in anticipation of default. The proceedings differ for banks. Compared to the general insolvency regime, bank insolvency procedures give a less active role to creditors’ committees and insolvency judges but grant a key role to the supervisor. If the supervisor judges that the bank’s capital is impaired, he can intervene in a preemptive way and constrain the bank’s activities with a view to preventing insolvency. These preinsolvency interventions are part of the prudential policy that can mobilize a large set of tools, ranging from the informal to the more intrusive. So, operationally, there is some sort of continuum between regular prudential policy and bank insolvency proceedings.

- The main objectives of a general corporate bankruptcy law is to find solutions to collective action problems like coordinating the debt collection efforts of multiple creditors to maximize overall recovery value and/or maximizing the realized value of the bankrupt firm’s assets and resolving the creditors’ claims in an orderly and collective manner. By contrast, even though these objectives may exist in the case of a bank failure, the principal goal of the bank bankruptcy procedure is to preserve the stability of the financial sector as a whole and to avoid systemic problems. So, in addition to private creditors, debtors, and stockholders’ interests, a bank insolvency law has to take account of public interest. The bank insolvency regime is concerned with externalities. In certain cases, this may justify the transgression of the principle of equal treatment of all creditors, which prevails in general insolvency law. For instance, small depositors and creditors may be protected and fully repaid, while larger creditors are compelled to engage themselves in the renegotiation of their claims. The same type of argument can justify the special treatment of the collateral and hence the preferential treatment for the collateral taker. Indeed, the incapacity to enforce collateral immediately upon default of the collateral provider may generate serious losses for the creditor and may impair his ability to face up to his own liabilities. This constitutes a nonnegligible contagion channel and gives a fair reason for protecting collateral arrangements from the general rules governing corporate insolvency codes. These exemptions seem to conflict with the objective of fairness to all creditors but are consistent with the preservation of financial stability. Similarly, the rules that underlie the orderly and smooth functioning of the payment and settlement

systems, which are based on the finality and irrevocability of payments even in the case of a bank failure, could be interpreted as conflicting with the rules structuring corporate insolvency laws.

The Shortcomings of the Legal British Device for Weak Banks

The UK's financial safety net relies upon general takeover and bankruptcy laws in its dealing with weak banks. There is no a specific mechanism for intervening preemptively when a bank is in trouble and subsequently ensure the continuation of critical banking functions—like access to the checking account and payment systems. This has been a serious disadvantage in the management of the crisis.

Because of the previously underlined specificities of bank failure, the “closed bank” resolution option has been considered generally unacceptable by leading authorities around the world, for large or multiple bank failures. Consequently, “open bank” resolution options have been favored instead. Nevertheless, this type of option, whereby the bank remains open and continues its normal activities even though it has failed financially, can take different forms that are more or less costly and conducive to moral hazard. When the open bank resolution option implies, as in the case of Northern Rock, a huge transfer of the risks and costs on taxpayers, it also means a weakening of both the internal and external stakeholders' incentive to monitor and discipline the bank in the future. In order to avoid such inefficiencies, which lead to a weakening of future financial stability, the risks and costs of bank distress should be clearly taken on by large depositors, junior bondholders, and shareholders rather than by small depositors and taxpayers.

The two requirements need to be reconciled. The promotion of the open bank resolution option permits the continuation of critical banking functions and avoids the drawbacks generally associated with official assistance.¹⁸ Several authors have proposed different schemes for managing wide bank bankruptcy (Eisenbeis and Kaufman 2006; Harrison, Anderson, and Twaddle 2007; Mayes and Liuksila 2004).

Despite a number of operational differences, these proposals have quite a few similar steps in common.

1. Prompt legal closure to avoid credit losses and prompt customer access to accounts. To avoid liquidity losses, the authorities take control of the insolvent bank.¹⁹
2. A prompt estimate of recovery values and assignment of credit losses (“haircut”) to uninsured bank claimants when the bank is insolvent. The idea is to promptly divide creditors claims into

a portion that will remain frozen and dedicated to the absorption of losses and a portion that will be made rapidly available to insured creditors as soon as the bank reopens. This step aims to enhance market discipline.

3. The quick sale or bridging of insolvent bank and prompt reopening,²⁰ particularly for larger banks with full access to bank services for insured depositors and borrowers.
4. Prompt reprivatization in whole or in part with adequate capital.

The U.S. approach to the treatment of weak banks is relatively close to the requirements about good practices in bank resolution procedures. Indeed, in the United States, commercial banks, insurance companies, and other financial institutions are exempted from the corporate bankruptcy code. Instead, the statement and resolution of their insolvencies are managed by the provisions of the Federal Deposit Insurance Improvement Act (FDICIA), and these rules, especially those designed for banks, drastically differ from the general corporate bankruptcy code (Bliss and Kaufman 2005). The special treatment of banks is no novelty in U.S. banking history. As a matter of fact, since 1933, the newly created FDIC has been the single receiver for insolvent national banks and could be appointed receiver by State banking agencies for state chartered banks. In 1991, the FDIC improvement Act (FDICIA) reinforced the powers of the FDIC and the Fed by enlarging their authority as a bank main federal regulator so they can now legally pronounce the insolvency of a state-licensed bank under their jurisdiction and appoint the FDIC as its legal receiver. The FDICIA clearly includes bank bankruptcy proceedings in the new supervisory policy whose structure comprises two main pillars: prompt corrective actions and the least-cost resolution. The act specifies five capital/asset ratios.²¹ The banks are classified in these different categories and each class of capital/asset ratio is associated with mandatory provisions and discretionary provisions. When a bank is downgraded to a lower level of capital zone, the regulatory constraint is consequently reinforced. Supervisors are authorized to close down a bank within 90 days after it has crossed the threshold of critical undercapitalization. At this point, the FDIC is vested with the powers of receiver as liquidator or with the authority of a conservator that acts as administrator in the resolution of the institution's crisis. So, the principle of prompt legal closure²² is at the core of the device. It induces easier compliance with the other previously mentioned principles:

- Under the prompt corrective action scheme, the regulators ought to scrutinize weak banks well before they reach the capital ratio closure trigger. The assessment of the recovery value of the bank as a whole or in part should therefore be made quickly²³;

- Legal closure is separate from physical closure. To insure such separation, the FDIC may run the bank through a bridge bank.²⁴ It is a temporary chartered bank organized to manage the deposits and secured liabilities and acquire the assets of an insolvent bank until final resolution can be reached. The FDIC was authorized to establish bridge banks by the Competitive Equality Banking Act of October 1987. It used this option to solve 114 failed banks between 1987 and 1994. This institutional solution contributes to preserving the business value of the failed bank, and it provides the time space needed for a better resolution.

Moreover, Run on the Rock reported that: “in the US, tripwires alert the authorities not only when a bank is entering a period of distress, but also when a bank radically changes its business model, or pursues an existing business model to an extreme extent”. Indeed, section 39 of FDICIA required the bank regulators to prescribe safety and soundness standards relating to noncapital criteria, which includes operations and management, compensation, asset quality, and earnings and stock valuation, and allows the regulators to take action if an institution fails to meet one or more of these standards.²⁵

A recent U.S. Government Accountability Office (GOA) Report to Congressional Committees²⁶ evaluates how federal regulators have used PCA (Prompt Corrective Action) to resolve capital adequacy issues at the institutions they regulate and the extent to which federal regulators have used the noncapital supervisory actions of sections 38 and 39 to address weaknesses at the institutions under their supervision. They studied a sample of 18 banks and thrifts that had been subject to PCA from 2001 through 2005. In most cases, regulators responded to safety and soundness problems in advance of a bank or thrift’s decline in the PCA capital category. For example, each of the 18 institutions subject to PCA appeared on one or more regulatory watch list prior to or concurrent with a decline in its capital category, 12 of the 18 institutions experienced a decline in their CAMELS ratings prior to or concurrent with becoming undercapitalized. CAMELS ratings are a key product of regulators’ on site monitoring. They measure an institution’s performance in six areas: capital, asset quality, management, earnings, liquidity, and sensitivity to market risk. Such a focus on liquidity and sensitivity to market risk would have probably been a fruitful forward-looking warning signal for the British regulator.

The Arguments for a Reactivation of Liquidity Regulation

The market turmoil that began in mid-2007 highlighted the crucial importance of market liquidity to the banking sector. The Northern Rock

debacle has been a painful and extreme example of the dependency of bank liquidity to the market liquidity in stress conditions.

Bank liquidity is complex. It can be defined as “the ability to fund increases in assets and meet obligations as they come due” (Basel Committee on Banking Supervision, 2008). The banking literature originally focused on funding liquidity, which is a narrow definition of liquidity, as it includes cash and assets easily transformable into cash. The traditional banking intermediation funding illiquid loans with liquid deposits involves the production of funding liquidity²⁷. There is another broader definition of bank liquidity that takes account of the more recent involvement of banks in asset trading. This second definition is closer to “market liquidity” since it describes the cost of selling assets. Commercial and investment banks provide market liquidity when they assume the role of market makers in derivative markets. The securitization of loans that transforms pools of illiquid loans into liquid securities also feeds market liquidity. So, banks provide both funding liquidity and market liquidity (Strahan 2008), consequently, they are vulnerable to both funding liquidity shocks and markets liquidity shocks. The recent market turmoil emphasized the links between funding and market liquidity.

In the 1980s, as the Basel Committee was working on the capital adequacy ratio (Basel 1), it also attempted to reach agreement on liquidity risk management. The latter was a failure. Since the 1990s, there has been a tremendous gap between the activism of international banking regulators in the improvement and harmonization of bank solvency regulation and the weaknesses of the reflections on bank liquidity requirements. This gap will probably be reduced in the near future. Indeed, in December 2006, the Basel Committee on Banking Supervision established the Working Group on Liquidity to review liquidity supervision practices in member countries.

Banking authorities may be concerned with bank liquidity for several reasons. The main arguments²⁸ have been previously mentioned here and call for stronger regulation for banks compared to other companies and for a special bank insolvency regime. Nevertheless there are additional justifications for a refocusing on bank liquidity requirements:

- First, banking authorities have encouraged banks to use real time gross systems (RTGS) for large value interbank payments instead of deferred net systems which are more vulnerable to systemic risk. But this choice in favor of RTGS induced a stronger need for liquidity because such payments systems are intrinsically highly liquidity intensive.
- Second, there is always the bank’s temptation to transfer the responsibility of bank liquidity management to the central bank through

emergency liquidity assistance. Such a temptation is currently probably stronger than it was in the past.

Indeed, as underlined by Tim Congdon (*Financial Times* September 2007) and C. Goodhart (2008), liquid assets typically made up 30% of British clearing banks' total assets²⁹ in the 1950s, whereas now traditional liquid assets represent about 1% of total liabilities. This sharp decrease in the holdings of liquid assets reflects the shift from the "originate and hold" to the "originate and distribute" model. The first model involved the creation of funding liquidity through asset transformation from loans to deposits. This traditional banking intermediation model has been reshaped by the growth in loan sales and securitization. In the second model, the bank creates market liquidity rather than funding liquidity by the transformation of "hard to sell assets" into funds that are easier to sell like bonds or other securities. This process allows the originating bank to sell assets to investors, recycle the capital and originate new loans which can in turn be securitized, yet it also dramatically increases the vulnerability of the bank to market liquidity risk. Market liquidity conditions can be subject to rapid and large-scale regime shifts as the 1997/98 developments or the subprime crisis have demonstrated with more detrimental effects on banking liquidity than ever previously experienced. These complex interactions between banking liquidity and market liquidity risks make a strict quantitative approach to bank liquidity risk rather difficult and probably partly inefficient. Among the regulatory requirements for liquidity risk the distinction must be made between quantitative, qualitative, and mixed requirements. Quantitative regulations usually aim to maintain certain liquidity indicators above minimum regulatory thresholds, whereas qualitative approaches focus more on the bank's internal controls and reporting practices. Mixed requirements mobilize both types of approaches.

More precisely, quantitative liquidity regulations can include stock-based approaches, mismatch based and hybrid approaches. Stock-based approaches require the bank to hold a stock of highly liquid assets that are immediately convertible into cash in all market conditions. This stock is weighed against total assets or some measure of liquidity risk. From a regulatory perspective, the higher such quantitative liquidity requirements, the stronger the bank's resilience to severe liquidity shocks. Moreover, these stock-based liquidity regulations make it easier to assess the vulnerability of an individual bank to a liquidity shortage, especially when compared with other banks. Mismatch-based regulations take account of a broader time dimension that assesses a bank's liquidity level by focusing on the predicted net cash position through time. This approach is consistent with banks' risk management practices that widely use mismatch analysis as

a metric to assess their level of liquidity risk.³⁰ More sophisticated quantitative models measure and manage liquidity risk. They are comparable to those used for measuring and managing market risk, such as liquidity at risk (LaR), but they are not widely used at present. Hybrid approaches combine both stock and mismatch approaches.

C. Goodhart (2008) showed the overlap between the two components of bank liquidity management—maturity transformation and the inherent liquidity of a bank's assets. The more liquid and instantly sellable—without significant loss of value under any market conditions—a bank's assets, the fewer worries for the bank about maturity transformation. Likewise, the lower the maturity transformation, the fewer worries for the bank about the market risk on its assets since it can hold them until maturity and overcome market disturbances. Moreover, the bank's vulnerability to a drying up of market liquidity hugely depends on the bank's business model. These remarks plead in favor of fairly flexible liquidity requirements rather than uniform liquidity regulation with an activation of the discretionary power of the regulator through pillar 2. In particular, the liquidity requirements should be related to the bank's solvency. This provision is similar to the prompt corrective action spirit in the preannounced progressiveness of the regulatory constraints. When a bank is downgraded to a lower level of capital zone, its liquidity requirements have to be reinforced. The bank's business model must also be taken into account for the determination of its liquidity requirements. From a wider macroprudential perspective exposure, it is necessary to go beyond that stage and increase the bank's liquidity requirement in accordance with its specific exposure to several types of macroeconomic shocks. The emergency liquidity assistance provided by the central bank in case of a systemic liquidity squeeze lies behind the rationale for this measure. It could be interpreted as implicit pricing or as some sort of counterpart for the central bank's protection whose aim is to limit the moral hazard induced by central liquidity insurance.

Concluding Remarks

The Northern Rock crisis constitutes a type of extreme school case of the new challenges for banking regulators and central banks as lenders of last resort in an economy characterized by banking disintermediation. As previously observed, the lessons that can be drawn from this debacle lie far beyond the UK's prudential device. Among others, the collapse strongly underlines the shortcomings of several European Directives that prove insufficiently constraining at national level. That is the particular case of the European Community Directive on the reorganization and winding-up of Credit Institutions that deals with the cross border aspects of bank

failure in the EU. It is consistent with the “single passport” principle. The directive does not attempt to harmonize member states’ bank insolvency laws but it aims to allocate the powers of bank resolution according to the mutual recognition regime based on both reorganization measures and winding-up procedures. So, the European legislator is agnostic as to what the bank insolvency regime should be like, while the Northern Rock experience underlines the need for a special insolvency regime dedicated to banks. Likewise, the shortcomings of the UK deposit insurance scheme were in fact allowed under the European Deposit Guarantee Scheme Directive. Several European countries actually cumulate the same weaknesses in their own Deposit Insurance Schemes.

Notes

* Code JEL G38, G33, G32, G28.

1. Mainly securitized notes.
2. Essentially from the retail market.
3. IKB is a German regional bank.
4. The maintenance periods run from one monetary policy committee meeting to the next. In order to obtain additional funding during this maintenance period, banks have to use the “standing facilities” which allow them to borrow all they need against an eligible collateral but at a penalty rate of 1% above the Bank of England’s rate.
5. See part 2 of the article.
6. For example JC Flowers, Citigroup, and the Virgin Group.
7. <http://blogs.ft.com/maverecon/2008/02/immoral-hazard-and-northern-rock/>
8. The contents of private information on loans is massively weakened in the “originate and distribute” model.
9. Initially the level of coinsurance was substantially higher, only 75% of qualifying deposits were guaranteed up to £20000.
10. Like Ireland, the Czech Republic, Poland, and the Slovak Republic.
11. These credit losses could be transformed into liquidity losses if at the end of the winding up process depositors were fully reimbursed.
12. In actual fact, there often is a combination of the two funding systems with a dominance of one of them. The European Commission classifies the different funding systems into four categories: high ex-ante funding, medium ex-ante funding, low ex-ante funding, and ex-post funding.
13. This is the model adopted by the Nordic countries.
14. House of Commons, Treasury Committee, *The run on the Rock*, 26 January 2008.
15. Except for small banks.
16. Households, small and medium companies etc.
17. The shock can be idiosyncratic or systematic.

18. Fiscal burden, weakening of market discipline, and the taking away of responsibility from shareholders etc.
19. In the case of Northern Rock, the nationalization was decided too late to alleviate the cost of the resolution to taxpayers. There has been a five-month delay in the search of a private sector's buyer. Eventually, when it noticed that the two private sector proposals (from Virgin group and from the bank's management) failed to offer sufficient value to British taxpayers, the UK government decided to put Northern Rock into temporary public ownership.
20. Next workday.
21. These ratios go from well capitalized to critically undercapitalized.
22. See step 1 on p. 66.
23. See step 2 on p. 67.
24. See step 3 on p. 67.
25. Under section 38 regulators must take increasingly severe supervisory actions as an institution's capital level deteriorates but it also authorizes several non-capital based supervisory actions.
26. US GAO Report to Congressional Committees (February 2007) "Assessment of Regulators' Use of Prompt Corrective Action Provisions and FDIC's new deposit insurance system."
27. It corresponds to the maturity transformation process.
28. Micro- and macroprudential arguments.
29. Mainly composed of Treasury Bills and short-term government debt.
30. See the Joint Forum Report, (2006), "The management of liquidity risk in financial groups."

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Lessons from the Northern Rock Episode

David G. Mayes and Geoffrey Wood

Abstract

We consider the lessons that might be learned by other countries from the problems with Northern Rock and the reactions of the UK authorities. We ask whether the surprise of the run on the bank came because economic analysis did not provide the right guidance, or whether it was simply a problem of practical implementation. We conclude it was the latter and that as a result other countries will want to review the detail of their deposit insurance and their regimes for handling banking problems and insolvency. The relationships between the various authorities involved were shown to be crucial; were a similar problem to occur in a cross-border institution, the difficulties experienced in the UK could be small by comparison.

Keywords: Northern Rock, bank failure, bank run, deposit insurance, lender of last resort

Introduction

Up to September of 2007, the authorities in the UK, and most private sector observers there, thought that the idea of a run on a solvent bank, with pictures of distressed depositors queuing in the street, was something that occurred in other parts of the world, such as South America, and not something that could happen at home. After all it had been nearly 150 years since the last significant bank run (on Overend, Gurney, and Co. in 1866), and the London market, particularly through Bagehot, had developed the ideas, which most other financial centers have

followed, of an effective LOLR to help banks which are illiquid but can offer adequate collateral. The UK was much slower to adopt deposit insurance, a device intended among other purposes to prevent bank runs, but such arrangements were in place and were more generous than in much of the rest of the European Union (EU), as prescribed under EU law. Thus, according to the ideas of Diamond and Dybvig (1983), depositors should not have felt any need to rush for their money when a bank seemed to be in difficulty—they were protected, and by more than one means.

This chapter deals with the experience from the run on Northern Rock, a substantial and venerable depository institution, which in theory should never have occurred. We do not document the crisis itself as this has been done in House of Commons (2008) and also in an extensive article by Milne and Wood (2008), to which the reader can refer, but focus on the implications.

Northern Rock had been growing rapidly and pursuing an aggressive funding strategy, relying heavily on wholesale markets. Far from being a secret, it was an announced strategy by the management, and hence as a public and supervised institution such risks should have been priced and prudential limits applied if needed. Although its loan book had been growing rapidly, it was generally believed that its loans had been granted prudently; it was generally judged that Northern Rock was solvent. Indeed the chancellor of the exchequer made this solvency explicit when justifying the loans and facilities granted to the institution.

While temporary special funding may have been inevitable given the unusual distortion to wholesale markets, this is something the safety net and the LOLR facility in particular are designed to handle; their mere existence, let alone use, should have provided the confidence depositors and investors required. But they did not. Moreover, this lack of confidence extended to those who might recapitalize Northern Rock, to the extent that proved impossible on terms that were acceptable to the government and hence ended up with the bank being taken into temporary public ownership.

We ask whether it is Bagehotian theory and/or its practice that was at fault, and how both of these should be adjusted to prevent such unnecessary lapses in financial stability occurring again. There has been a substantial enquiry into the events. Both authors have contributed to it. There has also been considerable recrimination as the various parties involved tried to blame each other. The UK Treasury, the Bank of England, and the Financial Services Authority (FSA) issued a discussion paper to invite submissions on how the system, particularly with regard to deposit insurance, should be reformed. Following that, they made joint proposals that the chancellor of the exchequer presented to Parliament at the end of January on how the framework might be strengthened (Bank of England, et al. 2008a). Just prior to that, on Saturday 26 January, the House of

Commons' Treasury Committee produced its report and recommendations on the issue.¹ We draw not simply on our own evidence but on the contributions of others.²

Our findings are that the theory seems to stand up well but that the practice has revealed several useful lessons about the operation of LOLR, coordination in crises, and the importance of avoiding liquidity losses to depositors, all of which have important implications for the conduct of policy in the future and the design of deposit insurance schemes in the UK and more widely in Europe. In particular it has become clear that the idea that depositors will be satisfied as long as they get access to their deposits within a few weeks or months as required under present legislation is highly erroneous. It also demonstrated again that the LOLR has to act promptly and supply such funds as are needed against a wide range of collateral in a manner that exudes confidence. In this case, a central bank has to act as a bank. It has to take a rapid decision either to lend to or to close an institution, and having decided, it needs to act firmly to support that decision and minimize the losses to society. This involves taking a risk. It is also clear that to deal with public unease, the response has to be swift, unified, and credible. Moreover, the temporary public ownership of the bank is a response already thought appropriate, particularly in the United States when a suitable buyer cannot be found, both in the interests of minimizing any costs to the taxpayer and in maintaining stability and confidence. In UK it was viewed as a failure of the system rather than as the effective operation of the safety net.

One area where the theory does have to be revisited is transparency. Accessing emergency lending facilities needs to be viewed as a reassuring sign. As a result of many of the modern reforms of monetary policy, there is a wide gulf between normal liquidity operations and actions when that market mechanism does not supply what one or more institutions may need. The summer of 2007 has also shown up wider problems when normal sources of liquidity dry up. In the last 20 years, the focus of prudential regulation and financial market structure has been on capital adequacy. This last year has emphasized the need for attention to adequate liquidity. The lesson needs to be learned so the problem is not repeated, but we do not see present circumstances as justifying a major increase in supervisory regulation. Indeed the substantial changes entailed by the adoption of Basel 2 may have taken some of the attention away from the fundamental principles of which the recent events have reminded us.

However, the Northern Rock experience has been a fortunate opportunity to focus attention on an area that governments in particular have not thought in need of serious attention, for it has done so without causing important losses. While shareholders have lost a lot of value, it is unlikely

that the losses will spread elsewhere in the system. Problems with other UK banks that have involved major injections of taxpayer funds were not the result of direct or indirect contagion from Northern Rock. They had their own problems. The incident could have been far worse. Northern Rock is a domestic institution focused strongly on the retail housing sector. It could have been a major multifunction bank, and it could have been an institution with strong cross-border activities. Here the current arrangements are far less satisfactory—if coordination between the ministry of finance, the central bank, and a single unified supervisor did not work as intended, what would the chances be where several such institutions were involved and none had the real power to act and give confidence to depositors?³

We set out how the wider problems that fortunately did not occur should then be addressed in this review of policy in the UK, and how the reforms should be emulated elsewhere, particularly in the EU. We concentrate on just five issues:

- Why were there problems in the exercise of the LOLR/emergency liquidity assistance function?
- Why the form of deposit insurance chosen did not prevent a run?
- Why was there not more action earlier?
- How can a failed institution be kept in operation?
- How can the problems of coordination be solved?

These form sections 2, 3, 4, 5, and 6 of the chapter, respectively. However, we begin with one over-riding issue: “certainty.”

1. Certainty

Many things will be uncertain when considering a potential problem or risk for a bank, but there are features of the way in which the safety net is expected to work that should give confidence to all those involved and hence reduce any panic, assist the chance of an orderly private sector solution before the problem becomes far advanced, and ease the task of the authorities in putting things right if they do go wrong. An important ingredient of effective crisis resolution is that people are clear in advance about the steps the authorities are going to take. Of course, this alone is not enough. The steps laid down in advance need to be credible not simply in the sense that people believe they will be followed but also in the sense that they believe these steps will bring any crisis to a conclusion.

Typically, authorities are cautious about being too prescriptive in advance, as all crises are different and important parts of the decision-making process will be dependent on the specific events. For example, while

one can describe the possible routes to recapitalization of a bank that has made serious losses, it would not be possible to set out in advance what will work best in a particular case. However, there are some aspects on which the rules can be clear. At least four such aspects can be identified:

- If there are liquidity or related failures in normal market financing, the central bank will provide unlimited lending against acceptable collateral to all institutions that can provide such collateral.
- Managers and shareholders must know that there will be no bailouts (government open bank assistance) by the taxpayer. If a bank gets to the point that it cannot continue without recapitalization, it will be either closed, if this is the least cost solution, or taken over and resolved by the authorities in a way that keeps the critical functions operating.
- Insured depositors will have no material break in access to their funds.
- The regulatory authority is compelled to intervene early and take increasingly strong action as capitalization falls.

The first of these is the classic version of the standard LOLR function. The traditional concept needs expanding in two respects. The Northern Rock episode has taught us that funding problems may not simply be at the short end of the market. Longer-term financing can also dry up. It is normally argued that the central bank should lend at a premium over the market, otherwise the private sector would always seek to transfer the worst risks onto the central bank at what is effectively a subsidized rate. We discuss later whether this premium should represent a “penalty” or just be thought of as a standard facility should the market not function properly; this turned out to be very important in the Northern Rock case. Access to “special” central bank funding has in recent years been viewed as a “failure” by the institution that needs to take up the funding. Thus, instead of being seen as successful operation of the safety net, the action is viewed as if the bank had fallen, hit the ground, and been seriously if not terminally injured. The impact was much closer to what would have happened if the central bank had refused to lend and hence in effect told Northern Rock it would have to undergo compulsory resolution procedures because they thought it was either insolvent or would inevitably become so.

The shortage of liquidity, not just in the UK but also in the euro area and the United States, has illustrated a further well-known issue. If the central bank is to increase liquidity successfully, this may very well involve effectively lowering interest rates. Although it may be possible to avoid a general fall in rates across the yield curve, these moves could clearly conflict with a monetary policy based purely on the control of inflation.

In many respects, the second bullet point is the most important. Shareholders and the management need to have as strong an incentive as possible to find a solution that keeps the bank going, otherwise they will lose, respectively, the entire value of their shares, and their jobs. For the incentive to be strong, the authorities need to have a credible way of handling a failing bank that will not cause problems for the financial system, whether the failure be actual insolvency or resolution without recourse to open bank assistance. But this will only be possible if the appropriate legal framework exists. Furthermore, as the last point emphasizes, the authority responsible needs to have a matching incentive to place heavier requirements on the bank to change and to prevent actions that either heighten the risks or transfer the losses from the shareholders and directors to the depositors and unsecured creditors.

2. Issues for Emergency Liquidity Assistance

In the Northern Rock case, it appears that the Bank of England was able to step in successfully, with the support of the government, and lend against acceptable collateral so that the bank could continue in business. Although it has not yet been possible to find a long-term private sector solution and the government had to step in and take over ownership, it has been possible to offer collateral despite the major withdrawal of retail deposits. The House of Commons' (2008) report has been critical of various aspects of what has been done (paragraphs 10–27 of their conclusions and recommendations) and earlier, decisive and well-managed intervention might indeed well have avoided the bank run and entailed a much smaller package of loans and guarantees. However, at the time some features of the situation inhibited this. We focus on just two.

- Does transparency impair the effectiveness of the operation?
- Is it possible to avoid what has been described as “stigmatization” in the sense that the mere fact of using such facilities act as a major depressant to the standing of the bank?

2.1. Transparency

One of the major difficulties about a potential banking crisis is that unless the problem and the solution are effectively revealed at the same time, then the problem is highly likely to become a crisis. Otherwise everyone involved will attempt to limit his or her possible loss. The ideal solution is preemption. If it is possible for management, directors, or the authorities

to realize that there is a problem and head it off by some form of recapitalization or reorganization that gives general confidence, then the uncertainty is removed.

Achieving this preemption necessarily requires having not just the potential problem but the discussion over its solution kept confidential. Since keeping confidences of this form when large sums may be at stake is asking a lot, it is reasonable to wonder if it is possible.⁴ In any case, as House of Commons (2008) makes clear, all firms including banks have a duty to reveal to shareholders anything that is likely to have a material impact on the value of their shares. In his evidence, the governor of the Bank of England made it clear that he would have preferred to keep the fact that the Bank was lending to Northern Rock confidential, but while his reasoning is clear, the practicality of the conclusion must surely be in doubt.

If one were to compare lending under an emergency facility with other sources of funds for banks then a measure of anonymity would be normal. Fluctuations in retail funds would not be identified, nor would the particular counterparties in short-term markets, unless these presented problems of concentration risk or exposure to related parties. Hence it is arguable that collateralized lending from the central bank could similarly be kept confidential. However, as a matter of practicality, and indeed of legality, this seems unlikely, except in the very short term. The question therefore is how to handle the disclosure rather than how to work at avoiding it.

The revelation of emergency liquidity support leads people to reappraise their holding of bank shares. Such a revelation will also certainly encourage competitors to hope that they can acquire some or all of the business at a favorable price. The share price of both potential acquirer and acquiree can vary very considerably once it is known or rumored that discussions are taking place. It is really only in the case of a private company that the discussions can be kept reasonably quiet. The share price of Northern Rock performed fairly predictably, declining steadily at least six months before the crisis broke by a total of nearly 50% (see Figure 4.1). It then dropped by a further third in just a few days.

Such fluctuations in share prices are inevitable. They reflect the entire future stream of potential earnings for the holder. This does not imply that depositors should be facing any similar fluctuations in their prospects. Indeed experience in the United States suggests that troubled banks are likely to increase the interest they pay on retail deposits.

Unsecured creditors of a company normally try to protect their positions if there is information that the company may be in trouble, thereby reducing the credit available and thus exacerbating the problem. For non-financial suppliers, a bank is no different from other companies. But in the case of a bank, funds are an essential input to the business itself; hence the

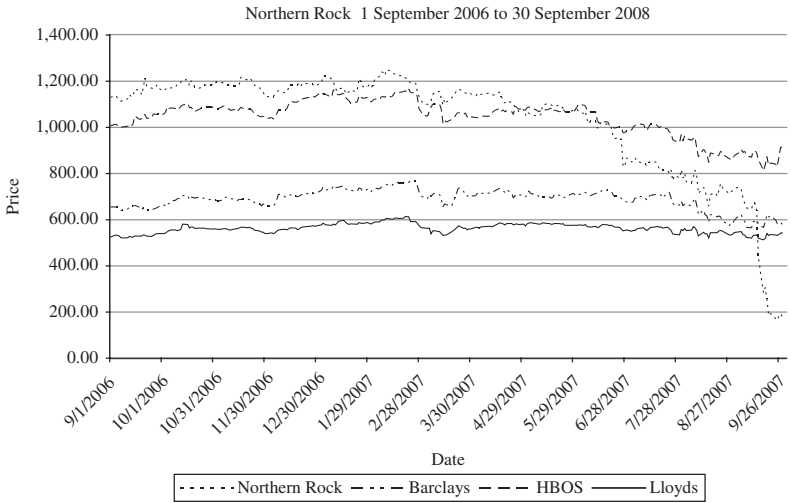


Figure 4.1 Share price of Northern Rock and major competitors

need for central bank support facilities. In most industries customers do not face large losses, or where they do have to put up large advance payments, insurance is usually available, as in the travel industry. Noninsured depositors and subordinated debt holders need to know that they will not suffer losses however the discussions work out, if they are not to try to close out their positions. This means that either they have to feel assured that the solution will not involve closure or, in the event of closure, they will not face losses. This would entail more than the normal deposit insurance and something more like a blanket guarantee, although, if it appears that bank closures can normally be achieved before capital is exhausted, this will reduce the pressure. In the case of Northern Rock, it was the drying up of traditional markets that precipitated the crisis: markets were already acting to protect their position. Once those most likely to be informed react then the others are wise to follow if this may reduce their potential loss. It thus seems inevitable that banks will face a more drastic problem than nonfinancial companies from the removal of funding in the event of a suspected problem.

Opacity at the time can only be justified in terms of reducing losses to those who are exposed and can be explained after the event when the information is no longer sensitive. If those involved know there will be full ex-post revelation even if in confidence to an inquiry then this will be an incentive to take actions as if they were transparent at the time.

Our central point here is that if the bank cannot be saved there should be prompt closure while the bank is still solvent. If that is done, then no depositor, whether insured or uninsured, loses money.

2.2. Avoiding the Stigma

There is a dilemma in designing support facilities. If it is expected that they will be used fairly regularly and have little in the way of a downside other than a small penalty, then, they will become a normal part of the market. But if they are rarely used, then their use will imply that something drastic has happened.⁵ The Bank of England in its evidence (to the Treasury Select Committee) voiced concerns over the moral hazard that could emerge if obtaining emergency lending were seen to be too easy. Part of the problem is that there is no gray area where a bank with a small problem can use a small amount of a facility. It is either using it or it is not. Further, when central banks charge a margin over other sources of funding, there is not normally a gradation in the price, except in the terms under which they will accept decreasing quality of collateral. Thus any bank, whether its problem is small or large, will appear to receive the same terms.

There is thus difficulty with a simplistic view of moral hazard. Deterrents only work when they deter. Once a facility is used despite the deterrent of a penalty, circumstances change. Any deterrence then relates to other market participants. It is arguable that once such a facility has to be used, then, additional liquidity should become widely available, in case there should be any problems of contagion. If the deterrent is so strong that it effectively destroys the bank using it, then the point is lost.⁶ The financial and reputational penalties therefore need to be sufficiently large that banks will not normally access “emergency” facilities and having accessed them will wish to reestablish normal facilities as soon as possible but not so large that they push the bank under. The additional liquidity in the market as a whole, along with the implication that the central bank thinks that the troubled bank has adequate collateral, should help the system work effectively. The difficulty with a LOLR function nowadays lies to some extent in the name—probably even more so with its Eurosystem equivalent “Emergency Liquidity Assistance.” Since the function is intended to be used under circumstances when an institution with eligible collateral cannot obtain funding from the market, it should be taken to imply that there is something wrong with the market rather than with the borrowing bank. It is partly for this reason that it is argued that the more normal LOLR function should be exercised in the form of exceptional loans to the market as a whole. Thus in the Northern Rock case, when it looked as if the market was drying up, the appropriate stance would have been to step

into the market to try to fill the gap so that Northern Rock would have been only one of a number of borrowers, and it would have become more difficult to identify it as being the sole beneficiary.

The trouble with any such action in the market is that it could be quite expensive for the central bank. In the case of Northern Rock, it would have been arguably impossibly large (House of Commons, 2008, p. 45). It would certainly be impossible after the event, if there was no collapse, to demonstrate that the cost was necessary. That could only be achieved by failing to act and seeing the crisis emerge. In this particular instance central banks had become bothered by the way in which markets appeared to be drying up in consequence of the problem of losses on the back of the subprime market in the United States. The problem was that not only was it a guess as to what the extent of the loss was but it was not clear where it was concentrated. Thus it was difficult to judge what the exposure of any counterparty might be, and indeed, what your own exposure might be, especially since the original exposure might be several layers deep in repackaging.

It is not very helpful to look at the particular source of the problem on this occasion, in that the problem next time is unlikely to be the same. Nevertheless, examining the separation of the exposure from that of the direct lender to the borrower with a problem is likely to be instructive. Traditional banking supervision should work well with the direct relationship. Banks and their supervisors will be aware of the extent of exposures to particular sectors of the market, and supervisors will be able to compute aggregate exposures in the market. At a remove from this, the calculation may be more difficult. Furthermore, though a bank that has on sold the risk will have altered its own exposure, the exposure still exists in the market.

Traditional banking supervision is not well adjusted to this sort of market risk. Yet those charged with financial stability have to consider what they would do in the event of such market collapses. The traditional role of the central bank is in quite narrow markets, where its resources are sufficient that it can make a noticeable difference. This is, perhaps, therefore another example where those involved in financial stability find themselves faced with responsibility but without the power to avert the problem. It will only be those who can exercise some regulatory control over the market who will be able to act in these circumstances.

3. Deposit Insurance

The Northern Rock episode has highlighted two issues over deposit insurance that have remained dormant in recent years, and a third which is still unresolved. The first is that it is often argued with insurance that if the

insured are open to some loss in the event of a claim, they will take more care in avoiding exposing themselves to risk. This argument has not been widely applied in practice to deposits, but the UK has been a counterexample, insuring only 90% of allowable claims above a £2,000 minimum. The second is that unless all deposits are insured to their full value, there will always be some people facing a potential loss; these can be expected to run on the bank in the event of probable difficulty. In the main these will be large depositors, who may have their deposits on terms that cannot be broken in a hurry without the consent of the bank—something it is not likely to give in a time of difficulty. There is thus a question of where any dividing line can be drawn that excludes some depositors or parts of deposits without inducing a run or other financial disturbance that the authorities find unacceptable. Issues of equity might affect that choice. The reaction of the UK government has been to raise the limit, which at £35,000 was already higher than in most other EU countries and embraces most ordinary depositors.⁷ That has led to considerable food for thought for other EU countries. However, and against that proposal, it has been argued in the report of the Select Committee that the limit could well stay at that level (as it covers a little over 90% of sterling bank deposits) and that the concerns of larger depositors would better be met by prompt closure. The argument was that below £35,000 one might view deposit insurance as in effect a form of social insurance, protecting the “widow and orphan,” and that larger depositors as well as possibly having the knowledge to watch the behavior of their bank would have access to other sources of funds for short term needs.

The third concern is over the length of the period, during which access to funds might be interrupted (Kaufman, 2007). Standard deposit insurance protects people against loss of their deposits. In Europe, unlike the United States, it does not usually consider that they also face losses from being unable to access their funds for an extended period of time. In the EU, the requirement is that people should be paid out in full within three months, although this deadline may be postponed for two further periods of three months.⁸

It is possible for normal transactions to operate, albeit with difficulty, when banks are closed, as is evidenced by the Irish banking strike of 1970, which lasted for over six months. There, people were prepared to accept endorsed checks as payment and retail outlets, particularly bars, were able to operate a form of secondary market among people they knew.⁹ However, this is not likely to work in the case of a failed institution.¹⁰ Any acceptable claims would need to be on some viable entity.

Furthermore, in advanced financial markets many people will quickly start having problems if standing orders and direct debits are not honored.

People's credit ratings could quickly fall. While power and telephones may not be cut off rapidly in the face of unpaid accounts, society in general has tended to become less trusting, and it may be difficult to get temporary credit except under extortionate terms until the next salary payment can be cashed. Hence if insured depositors feel they will be in serious difficulty if a troubled institution fails, they will still want to withdraw at least some of their deposits to tide them over the period of difficulty—and once making such a withdrawal, it might well seem sensible to withdraw the entire balance at the time—just in case. This would therefore generate a run even though there would be no prospect of actual loss of funds.¹¹

This is in principle a problem with a straightforward solution, as the period without access could be made very short. If there is a direct handover that keeps the business operating, as in the case of a bridge bank in the United States or the appointment of a statutory manager in New Zealand, then the issue does not really arise at all. However, if the institution does shut, then the relevant accounts have to be transferred. Experience in the United States suggests this can be quite rapid (certainly for access to a proportion of the account) while the eligibility of the whole balance is being established. However, effecting such rapid transfers requires either access by the new provider to the failed bank's computer systems or that the accounts are structured such that their transfer is readily possible. In the case of anything other than a small bank, this would require both extensive requirements on how banks organize their account handling systems and substantial advance preparation involving interaction whoever it is will effect the transfer. This required extra steps in the United States (FDIC 2006).

The process of regaining access to deposits needs to be swift and guaranteed. If people have to file claims or the authorities have to assess whether the depositor has liabilities to be offset against the deposit (as would normally be the case in an insolvency), as was the case in the UK at the time of the Northern Rock Crisis, the process will be drawn out and hence will not work.

As Hüpkes (2004) has pointed out, only some of a bank's functions need be transferred to a new entity if financial stability is to be maintained. Many of the other activities can be allowed to cease and will readily be picked up by the rest of the market at relatively low cost to those who are affected. They may involve a small loss from a broken contract and incur extra costs in recontracting, but these will not amount to either severe hardship or the generation of knock-on failures and personal bankruptcies.¹² Hence the costs of organizing the transfer of accounts need not add anything significant to the costs that would otherwise be incurred in insolvency, as these normally approach around 10% of the capital value that can be recovered. The main distinction is likely to be over who bears them.

In the case of insolvency, the shareholders are wiped out and then the creditors bear the loss in increasing seniority. For transferring deposits, some of the costs will have been incurred by the firm and therefore borne by its customers and shareholders. However, some will have been incurred by the deposit insurer and hence will be incurred by the rest of the banking system, or possibly by the taxpayer if that is how it is financed. Collateral damage through contagion in both the financial and real sectors will be much more widely borne in either case. The key feature is that maintaining the function—allowing holders continuing full access to their insured deposits—does not entail that the troubled bank itself has to be kept in being, (although that is one possible route).

Most countries are a long way away from having such arrangements in place. Even providing access to insured deposits in quite small failed banks has in practice proved difficult (Moe 2007). The problem is balancing the costs of making the arrangements with the chance that they will be needed. Until the Northern Rock episode, most European countries would have judged the costs of implementation too high. Now that it is clear that there could be a run as a result, the balance will have changed markedly.

This will therefore come as a helpful wake up call to other deposit insurers, particularly in Europe, who can take the opportunity to implement systems that enable a rapid payout. However, there are concomitant issues to be resolved. For example, if all deposits in a particular class are insured it makes it much easier to have a swift payout; the need to check whether an account is eligible or establish what portion of it is covered is greatly reduced. If there need to be checks to establish whether the account holder has other accounts that have to be aggregated in determining what funds are insured, or their needs to be a check on the residence status of the account holder to establish eligibility, then a swift resolution will be more difficult, or the nature of the ongoing computer checks in the failing bank will need to have been more comprehensive.

This leads back directly to the first two issues raised in this section—whether to have coinsurance and where to place the dividing line, if any, between insured and noninsured deposits. The implication of the Northern Rock experience is that coinsurance does not work. In the first place, it does not appear to lead to any more careful behavior by depositors. Studies in New Zealand, where there is no deposit insurance, suggest that the normal depositor pays no attention to the vulnerability of their bank. Bank deposits are regarded as safe. There have been no bank failures in the memory of most depositors, so the risk is treated as nonexistent.¹³ In any case, it is never clear what the authorities would do in the event of the failure of a major bank, even where there is no explicit insurance. It seems unlikely that a government, particularly in a country with a three-year electoral

cycle such as New Zealand has, would want to see large numbers of its citizens losing money in such a failure, even if their losses given default are by no means total. The temptation to provide at least some recompense and to load the cost on future generations will be enormous. There is almost certainly implicit insurance, however strong the rhetoric is to the contrary.

Northern Rock illustrates this point clearly. The chancellor of the exchequer felt obliged to give a blanket guarantee. Thus, although insurance was ostensibly partial and up to a limit, in practice it was total and without limit. Given the public reaction on the basis of partial coverage, it is not surprising that the UK is revising its deposit insurance scheme. The interesting issue now is how other countries will react. They have not had the problem themselves, so their systems are untried. What do their depositors believe? It is difficult to answer such a hypothetical question directly. It is also difficult to assess it indirectly by looking at behavior. It is difficult to see whether there is much in the way of self-insurance. Typically, depositors do not hold very large sums in their insured accounts but invest the money not needed for transactions purposes in other higher earning savings vehicles within the bank, many of which will not be insured. Of course much of their savings will be held outside the bank altogether, in forms that have various levels of security. It may therefore be possible to see how people have reacted as the degree of insurance or security changes.

A little can be judged by the pricing of deposits and other unsecured instruments for the bank. Granlund (2003), for example, has shown that there is a considerable discount for banks in Germany where banks are generally seen as likely to be acquired by other banks in the event of actual or near failure rather than being allowed to collapse. However, this tells us about the market's view of the likelihood of implicit insurance (whether through public or private sectors) not about the views held by individual holders of retail deposits, and it is those who will constitute a run in the sense of politically unacceptable queues outside banks.

The Northern Rock episode is thus likely to end coinsurance by depositors and may lead to some implicit insurance schemes becoming explicit if the incentive effect does indeed appear to be near zero. However, this is unlikely to apply to cases where the coinsurance is between the taxpayer and the banking system, although it may alter the nature of the funding. Most deposit insurance schemes have limited or no funding and hence implicitly rely on state funding to tide them over should there be a major disaster. Deposit insurance schemes are predicated on there being either no claims or at least only small claims relative to the total stock of deposits. Clearly the private sector may find it difficult to recapitalize the insurance fund after a big shock that causes consequent losses all round the financial sector. The government is then faced with a choice when bank insolvency

looms—should it provide temporary (it hopes) loans to a troubled institution to stop it failing through a run or should it provide temporary loans to the deposit insurance fund because it did not prevent the failure?

The issue of where to draw the dividing line between insured and uninsured deposits is also difficult to decide if the outcome in a run is purely in the behavior of different depositors. Clearly, for a deposit of a particular type the depositor is more likely to run the larger the deposit, so introducing dividing lines is merely likely to alter the length of the queue. Some deposits have a built-in time delay, so that they cannot be removed immediately. Although typically banks enforce this by not paying interest on days before the withdrawal equivalent to the notice the customer is supposed to give, in the case of trouble, they would be likely to enforce the letter of the agreement and insist that the customer wait, which will in practice mean that those depositors get drawn into the insolvency proceedings. Whether that would affect the length of the queue is debatable. People would no doubt turn up in hope.

The initial idea behind deposit protection was to cover the people who could not be expected to be adequately informed about the state of their bank to manage their own risks.¹⁴ The current agreed minimum limit in the EU of €50,000 is of this order of magnitude and would cover the full value of most retail bank deposits. However, some deposits now exceed that so it is arguable that there are reasons for protecting some higher deposits, partly because of the size of the shock to the financial system from their loss and partly because of the lack of information for the private individual. Our point is different. In the EU the insured limits vary and the UK is even now above the average. Given that banks can compete across borders in the EU and if they choose to do so by means of branches their deposits are insured by their home country, this could have a considerable impact on competition for retail deposits if customers were to begin to feel that banks might be fragile. Larger deposits could gravitate to the regimes with higher protection. While not currently an important consideration in practice, this could become a feature that adds to the fragility of the financial system in times of stress. This has led to a general reappraisal of the appropriate level of deposit protection in all EU countries.

One other source of difference among deposit insurance regimes is the degree to which they are prefunded. If the deposit insurer is to be able to act immediately on insolvency to give people access to their deposits, this implies that it must have immediate access to funds. While in principle this could occur as a standing facility from the banking system, it might look more plausible if it had its own funds or access to a public line of credit. The UK pay-as-you-go arrangement could have made a rapid payout difficult. An additional argument in favor of prefunding is that banks are more likely

to fail in times of general economic distress, and it would not be sensible to demand additional funds from the banking system when it is stressed anyway. Getting the funds in good times would be more prudent.¹⁵

4. Getting Earlier Action

4.1. *Prompt Corrective Action*

The House of Commons' (2008) report finds fault with the FSA for not having acted sooner when it found that Northern Rock's funding model was extreme for the industry and opened it to considerable risks. Irrespective of whether the FSA was at fault in this instance, this raises a significant issue for supervisory intervention. In general if action is to be successful it should take place well before an institution would get into trouble, as changing course takes some time to implement. Thus, if the FSA had begun to move strongly when Northern Rock's share price started slipping relative to the rest of the banking sector and criticism of its funding model became strong, it might have been possible to reorganize funding before the problem reached such serious proportions. However, this involves acting when a bank is clearly compliant with capital requirements¹⁶ and when the criteria for action, such as known to be inadequate stress tests, are less obviously objective.¹⁷

Kaufman (2007) captures the essence of the problem by his emphasis on the word "prompt." Treatment of problems must normally occur through the private sector well before a bank starts breaching regulatory limits. Thus poorly performing or risk-taking banks should see their actions reflected in their share price (for instance), so that either the existing owners change course or the assets are sold to new owners who believe they are able to manage them more effectively. It should not be left to the last minute. However, the Northern Rock episode illustrates that this will not always be the case, and when the market realizes that it has made a mistake, the readjustment will be sharp and substantial. In such circumstances the response has to be commensurately rapid. There is no opportunity to reflect. The procedures available therefore have to be capable of prompt activation.

Kaufman mentions three procedures.

- The authorities must have the power to step into a troubled institution should it get too close to failure.
- They must be capable of forming a rapid judgment about the extent of the losses and the sensible action.
- They must be capable of acting fast enough to be able to assign the losses and keep the bank operating without a material break.

Furthermore, if the bank does close,

- the authorities have to be able to act fast enough to ensure that insured depositors have access to their funds without any significant break.

All of these not have only to be the case but must be generally believed to be the case. The depositors in Northern Rock needed to believe that there would be no problem of either losing their deposits or losing access to them. The chances of a run would then have been much smaller. Depositors are unlikely to be concerned whether their deposits are being funded by the deposit insurer or whether the accounts are being administered by another bank as long as they are protected against loss and the interruption that results in inconvenience or loss of credit reputation.

The well known U.S. rules for Prompt Corrective Action (PCA) for compulsory intervention and action form a good template for other administrations to consider, but the trigger points relate to undercapitalization (Mayes, et al. 2008). This is rather outdated in the framework of risk management envisaged in Basel 2. Trigger points should also be based on the requirements set out in pillars 2 and 3 of the Accord and not just on pillar 1 capital adequacy. The Basel 2 Accord, as embodied in legislation in the EU through the Capital Requirements Directive, does indeed set out what should be considered under pillars 2 and 3 but it does not embody a set of actions that the authorities in the member states are to take in the case of noncompliance. These are decided at the national level and do not in general have the force and urgency of the U.S. PCA.

Risk management issues, as Northern Rock illustrates, are just as capable of driving a bank into difficulty as is undercapitalization.¹⁸ The problem is to formalize them—say in terms of the probability of default or the loss given default.¹⁹ This clearly represents an area for urgent study by the authorities.

5. Keeping Vital Functions of a Failed Institution Operating

5.1. *Investor of Last Resort*

Governments face a serious dilemma if an institution that gets into trouble has to be kept open and operating if financial stability is to be maintained. While initial lending may be collateralized, everyone knows that some form of guarantee exists beyond the collateral. That in itself may be sufficient and confidence will then be maintained even if the guarantee is never exercised. If the market is uncertain about whether the guarantee will be

exercised then it will have to be exercised—as the uncertainty will lead to the rush to exit, yet another clear example of where “constructive ambiguity” does not work. The problem in these circumstances is to manage both the potential loss and the moral hazard.

A simple solution is to make no institution so large that it is “too big to fail.” The Northern Rock episode “helpfully” reveals that this boundary covers rather more institutions than many have predicted. In the United States, for example, before the present crisis it was suggested that perhaps only some ten institutions were too large to fail. Clearly in other countries the number will depend on the degree of concentration in the market. But it is likely to be politically more difficult to allow institutions to fail than it would be to allow them to fail even if failure did not harm financial stability. Concentration in marginal constituencies or where the losers are economically significant will all contribute to a wish to keep institutions open.

Key in these circumstances is how the institution is to be kept open. Indeed the use of the word open is itself somewhat misleading, as indeed is that of the word fail. Here again the United States sets a good precedent. The business of a bank can be kept running even though its current legal personality is terminated and the bank reconstituted under temporary public sector control in the form of a new “bridge” bank—bridge in the sense of bridging the gap between one period of private ownership and the next.

Such an ability to intervene did not exist in the UK before the new 2009 Banking Act and ordinary insolvency procedures would have applied. This means that the bank has to be kept open either by loans while retaining the existing ownership or by nationalization. This exposes the taxpayer to the full extent of the losses. It is nationalization that happened with Northern Rock. Where it is embodied clearly in the banking law as in the United States, it is possible for the temporary nature of such an action to be explicit and for the form of such an acquisition to be known in advance to reduce the controversy involved.

6. Coordination Failure

6.1. *Government by Committee*

The Tripartite Agreement in the UK recognized that three groups of parties need to be involved when a bank gets into difficulties: the supervisor, as responsible for ensuring prudent conduct by the bank; the central bank, as the lender of last resort and institution responsible for financial stability in the country; and the government in the form of the Ministry of Finance in that it would be responsible for any injection of taxpayer funds.

In most EU countries, the deposit insurer is not an active player in these discussions and therefore has a secondary role to play. In the United States it has the lead role.

There were clearly some problems, in the case of Northern Rock, with the various agencies playing their roles as the others would feel appropriate. The same could well happen in a crisis in other countries, despite the crisis management simulations that are typically undertaken. The problem is magnified when the authorities have to handle an important bank that operates in many countries. Then the number of agencies involved can become very large. For example for an institution involved in just ten countries there would be at least 30 at the table even if there were a single unified supervisor involved in each country, as in the UK. Despite the suggestions of Schoenmaker and Oosterloo (2006) to the contrary such an arrangement is likely to be unworkable (Eisenbeis and Kaufman 2008). Something where one party can take the lead in a crisis is needed.

In the case of cross-border banks in the EU and of course also of large complex financial institutions, it is necessary to get the authorities to work together. This needs to be carefully organized because there will be major recriminations in the event of difficulty should it be possible for one authority to blame another on the grounds that they were not all properly involved in the decision making.

Both the Basel Committee and the EU have gone some way to sorting this out by insisting on the designation of a lead or consolidating supervisor; however, this does not go far enough (Mayes 2006, Vesala 2006). For a group of supervisors to act with the speed and efficiency of a single supervisor their operations need to be much more integrated. They need to operate as a "College" under the lead/consolidating supervisor, having access to a common shared database and having common powers for action. It would considerably advantage the troubled bank if the College applied a single rule book as well.

The key problem will arise when action is required. In a diverse group it is unlikely that action in all jurisdictions is required at the same time or that the need is equally urgent in all cases. Moreover a problem in one area may require action in another where there is no problem, especially where capital ratios run across countries.

Once action to protect financial stability is required then it will be even more difficult to get agreement as a function may be systemic in one country but not in another. One country may be happy to see a bank close because such closure will have only a minor impact, while in the other jurisdiction the effect of closure could be a major financial calamity. In such joint problems it seems clear that the country with the potential serious difficulties should have the main say in the resolution. But this

would cause acute problems if the costs of resolution were going to fall mainly elsewhere. Countries would no doubt prefer others to bear a larger proportion of the loss, but small countries cannot possibly take on the support of the entire banking group just to maintain systemic functions in their own jurisdiction; and all countries, regardless of size, might be reluctant to support an institution primarily important elsewhere. It is very unlikely that many jurisdictions have provisions for supervisors to take account of the impact outside their own boundaries to the extent of subordinating their own country's interests to those of others.

6.2. Cross-Border Arrangements

The Banking Act 2009 has resolved the problem of who should be in charge in the UK. While the FSA is to remain responsible for deciding when a bank requires heightened supervision in the face problems and when the new Special Resolution Regime (SRR) needs to be triggered, it is the Bank of England that is responsible for running the SRR.²⁰ The Act does not support the idea of emulating the United States and having an equivalent of the FDIC (Federal Deposit Insurance Corporation) that will act both to minimize the losses to the deposit insurance fund and to guard against any threats to the financial system as a whole. The UK deposit insurer, the Financial Services Compensation Scheme (FSCS), like many other European insurers would require a completely different structure if it were to be capable of taking on that responsibility, whereas the central bank had much of the resources already. There is still some possible conflict of interest in the new UK arrangements, as protecting the FSCS against loss might imply early action, while protecting the reputation of the FSA might imply leaving a longer period for the matter to be resolved. The central bank may also conceivably have a potential conflict between the needs of price stability and financial stability. Such a conflict is however rather a remote possibility (see Wood 2000).²¹ The two Deputy Governors in the Bank are each responsible for one of the two areas to maximize the chance that each need will be addressed on its own merits.

There is manifestly room for debate over which body should be responsible but not over whether some body should be responsible. At the European level the obvious choice is between a European Deposit Insurance Corporation (EDIC) and the European Central Bank (ECB). (The latter has the possibility of being assigned these powers under the terms of its constitution.²²) A separate agency would avoid the conflict of interest. Since being able to meet depositors' claims without a material break will also involve extra resources for deposit insurers, changing the role of the organization may make sense. Giving such powers to the ECB

might compromise its independence, given the fact that national taxpayers will have to bear any losses.

Such an EDIC does not have to be large. It only needs to handle the cross-border banks that have systemically important functions in at least one member state. This implies some 30 to 40 banks at present. The rest could remain under the control of the lead country. That same lead country model could work for the larger banks on a case-by-case basis (Mayes and Wood 2007).

7. Concluding Remark

The upshot of this discussion suggests that the Northern Rock episode has revealed little that leads us to believe that economic analysis was particularly at fault in allowing the problem to emerge. According to House of Commons (2008), the problems emerged from an unfortunate combination of weaknesses in implementation and a major external shock. The five main lessons we draw from this experience therefore need to be considered in all countries and not just in the UK:

1. Deposit insurance needs to be designed so that
 - a. the large majority of all individuals' balances are fully covered and
 - b. depositors can all have access to their deposits without a material break;
2. The activation of emergency liquidity assistance arrangements needs to give confidence that those being assisted will survive, and should be seen as the system working as it should, rather than signaling some breakdown;
3. There needs to be a regime of prompt corrective action whereby prescribed actions of increasing severity are required within short time periods according to a set of triggers based on capital adequacy and risks of failure;
4. There needs to be a legal framework such that the functions of systemic importance in banks that "fail" can be kept operating without a material break,
 - a. such "failure" should occur before the bank becomes insolvent so that there is little chance of losses to the taxpayer and
 - b. this will normally involve a special insolvency regimes for banks;
5. Some designated institution needs to be in charge of intervention in failing banks to ensure rapid and concerted action; and
6. At a European level far greater coherence among the legislation and authorities of member states is required if these provisions

for the handling of problems in domestic banks are to be equally successfully handled in the case of large cross-border banks.

If the first five provisions had been in place, it is highly unlikely that there would have been a run on Northern Rock. The record of over 140 years without a significant bank run in the UK would have been maintained.

Further, Northern Rock was a medium-sized domestic bank. If the problems had occurred in a larger cross-border bank the consequences would have been much more severe as the experience in September and October 2008 showed, particularly in the case of the Icelandic banks. Although it will not feel like it to those who have lost money or their jobs in the Northern Rock episode, it is fortunate that the wake-up call to action had such limited cost. The UK authorities managed to respond rapidly, getting the new Special Resolution Regime in place by February 2009, although this was not in time for the substantial banking problems in the autumn of 2008. However, it is still well ahead of many other countries facing these problems who have yet to get to new legislation.

Notes

1. *The Run on the Rock*. House of Commons' Treasury Committee, Fifth Report of Session 2007–08, vol. 1, 26 January 2008. This report, which only focuses on the implications for the UK has many recommendations that are broadly in line with the conclusions drawn in this article. The differences are minor and essentially reflect institutional features of the system in the UK that may not apply in other countries.
2. The authorities have since issued two further consultation papers (Bank of England, et al. 2008b, 2008c), before drafting legislation, which, after comment, was enacted as the UK Banking Act 2009, and the FSA (2008) has published a self-critical review of its handling of Northern Rock.
3. A year later in September/October 2009, with the collapse of Fortis and the failure of the three main Icelandic banks we have seen that the result can be very messy.
4. As Milne and Wood (2008, pp. 19–25) explain, it was clear on Monday 10 September 2007, that Northern Rock would need to access emergency financing from the Bank of England. However, it was not planned to release the information and the details of the package until Monday 17 September. However, the market got wind of the operation by Thursday 13 and the plan was “leaked” by the BBC that evening. Thus instead of a clear, measured, and reassuring statement by the authorities, it was journalists who chose what to say. A run ensued. This run was only brought to an end by the announcement of a government guarantee, something that had not been part of the intended package.
5. The Bank of England's standing facility that permits eligible banks to borrow overnight against eligible high quality collateral at a penalty over the market

rate was used 19 times in the period between July 2006 and August 2007. While this facility is intended as an automatic means of correcting any market problems or “errors” by banks, its use has been a source of unfavourable remark in the media as explained in the Bloomberg release on 30 August 2007, available at <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=af71ke90mKik>.

6. It has in any case been argued that the literature tends to take an unjustifiably pessimistic view of bankers’ behavior and that there is little evidence of more risky behaviour when there is a safety net or improvement in the safety net among advanced countries.
7. The proportion quoted in House of Commons (2008) is 96%, so the increase would involve only a small number of depositors. Of course, better protection may result in a general increase in the size of bank deposits. The limit is £50,000 in the 2009 Banking Act, which would cover 95% of deposits at that time.
8. The latest proposals from the European Commission suggest that the EU should get the delay down to a few days.
9. The proportion of dishonoured claims when the cheques could actually be presented turned out to be quite low. It is not clear that levels of trust and honesty are anything like as high these days.
10. It is also likely that it would work only in a small country.
11. It is noticeable that the run on Northern Rock was not primarily a flight from bank deposits into cash but a transfer of deposits from a bank thought to be in trouble to other major banks thought to be “safe.”
12. Hüpkés suggests that a function of a bank is critical if it is essential to the functioning of a financial market, if failure would have serious adverse consequences for the financial system and the real economy or if the function cannot readily be recreated by another provider without substantial loss to itself and others in the financial system. As it stands, these are all amorphous concepts and would need to be translated into concrete terms. In theory it is possible to identify who are the essential players in the financial system—in payments, settlement, securities holding, etc.—and to set out which functions and providers will need to keep in operation. Of course, it may be in the interests of these providers to get themselves identified as such even if this then has consequences in the form of a more zealous supervisory regime. The criticality in itself will tend to convey an offsetting financial advantage as it reduces the possibility of loss.
13. Even in the case of finance companies, where there have been several failures over the last year, it is not clear that depositors associate higher risks with higher (better) interest rates. Between mid 2006 and mid 2008, 18 finance companies failed with about NZ\$2.5 billion of deposits between them, which is approaching 1% of the total in the financial system.
14. That at any rate was the idea in comparatively recent times. When the first country to introduce deposit insurance, the United States of America, did so in 1933, the intention was to act a substitute for the LOLR in its role of preventing contagious bank runs.

15. Of course, this is by no means the end of the issues. If there is prefunding then banks will pay the equivalent of premiums given the size of their deposit base. It is arguable that those that appear a higher risk should pay a higher premium. Indeed the knowledge that regular review of premiums takes place could be a factor encouraging an earlier purchase of a troubled bank before the costs rise.
16. One awkward feature (for the FSA) of the Northern Rock saga is that shortly before the debacle, the FSA actually eased Northern Rock's capital requirements when a longer-term report on compliance with Basel 2 was completed.
17. Clearly some action was already taking place in the first half of 2007 (Milne and Wood, 2008, p. 4). Northern Rock had slowed its lending growth and increased its liquidity but issued a profits warning in June. The FSA had considered Northern Rock's stress testing in visits in April and May 2007, but its granting of a waiver for Northern Rock to use the "advanced approach" under Basel 2 in June was a contribution to Northern Rock increasing its interim dividend in July, according to the chief executive's evidence to the House of Commons Treasury Committee on 16 October 2007, Q689.
18. It has been remarked that shortage of capital kills slowly but that shortage of liquidity is like a bullet in the head.
19. It is noticeable that the UK FSA has proposed in its review of liquidity requirements (FSA 2007, p. 37) that it should apply the same risk "appetite" for liquidity as it does for capital, namely, that there should be no more than a 1 in 200 chance of becoming insolvent in the coming year. Such measures could be PCA triggers.
20. The Bank of England can also suggest to the FSA that the SRR should be triggered.
21. The Treasury Committee suggested a similar but slightly different arrangement (House of Commons, 2008).
22. This has to be a decision by the Council of Ministers; the ECB cannot award this responsibility to itself.

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The Northern Rock Crisis: A Multidimensional Problem Waiting to Happen

David T. Llewellyn

Abstract

In August 2007, the UK experienced its first bank run since 1866. Northern Rock had adopted a business model (heavy reliance on securitization and wholesale market funding) that exposed itself to a low-probability-high-impact (LPHI) risk. The chapter argues that it was an accident waiting to happen in that there were fundamental fault lines in the institutional architecture for dealing with failing banks in the UK. In particular, there was an inconsistency in the deposit protection scheme, no special insolvency arrangements for dealing with failing banks, and no *ex-ante* Resolution procedure. There were also serious failings in the supervision of Northern Rock, and in the split of responsibilities between the Treasury, Bank of England, and the Financial Services Authority (FSA).

Introduction

For three days in August 2007, the UK experienced its first bank run since Overend and Gurney in 1866. In a few days in August around £3 billion of deposits were withdrawn (around 11% of the bank's total retail deposits) from a medium sized bank—Northern Rock. The unedifying spectacle of widely publicized long queues outside the bank's branches testified to the bank's serious problems. The run of deposits began immediately after it was announced that the bank had sought liquidity assistance

from the Bank of England and that the regulatory authorities had declared that the bank was solvent.

In two major respects, the crisis that hit Northern Rock was both predictable and, to some extent, predicted even though this was not related specifically to this bank in particular. First, for well over a year, the Bank of England, and to a lesser extent the FSA, had been warning about evolving trends in the markets: sharp asset growth, systemic underpricing of risk, and some warning signals that some of the risk-shifting characteristics of new financial instruments (most especially credit derivatives such as Collateralised Debt Obligations and Credit Default Swaps) might not be as watertight as they might seem. There were also warnings that the bank's strategy of relying heavily on wholesale market funding made it particularly susceptible to liquidity risks. Second, and more fundamentally, there were certain institutional weaknesses in the UK's regulatory regime that made it susceptible to problems such as those that arose with Northern Rock:

1. a fundamental flaw in the deposit protection scheme,
2. no established special bankruptcy regime for banks,
3. no well-established or predictable resolution regime for handling troubled banks, and
4. an institutional structure of financial supervision that separated responsibility for systemic stability and lender of last resort (LOLR) (in the Bank of England) from prudential supervision of individual banks (located within the FSA). This was always likely to be potentially hazardous in crisis conditions (Llewellyn 2004).

In particular, there were fundamental fault lines in the UK's institutional arrangements for handling distressed banks. A U.S. perspective is offered by Eisenbeis and Kaufman (2007b) who argue that the British regulatory authorities failed to learn the lessons of crises in other countries (notably the Savings and Loans crisis in the United States in the 1980s). The latter case produced a major regulatory regime shift with the passing of the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991 that included a Prompt Corrective Action (PCA) regime. Before that, U.S. arrangements had also recognized the need for a special insolvency regime for banks that is different from the generality of companies.

At its peak, Northern Rock had assets around of over £100 billion and a growth rate of around 20% for over a decade. Although it was only the seventh largest UK mortgage lender, in the first half of 2007 its new mortgage lending accounted for around one quarter of the total in the UK. The pace of mortgage lending substantially exceeded the growth of retail

deposits with the “funding gap” met through securitization and other wholesale market funding.

Before considering the nature of the Northern Rock crisis, several points of perspective are noted at the outset: the bank remained legally solvent (the nominal value of assets exceeding liabilities), it was reasonably well-capitalised, in July (less than three months before the crisis struck) it increased its dividend to shareholders, in April its share price hit a record high, only months earlier the bank had reported record profits, the quality of its assets was not in question, it had no direct exposure to the U.S. subprime mortgage market, its loan-loss record was good by industry standards, and for many years the bank was regarded as something of a star performer in the City and financial markets. Furthermore, earlier in the year the FSA had lowered the bank’s target capital ratio in line with the Basel 2 Accord, which allows banks to compute their own minimum capital requirements using the Advanced Internal Ratings Approach.

Two particular problems emerged during the summer months of 2007: a generalized lack of confidence in a particular asset class (mortgage bank securities) associated in large part with developments in the subprime mortgage market in the United States and doubts emerged about the viability of the Northern Rock business model in particular.

In September 2007, Northern Rock was forced to seek substantial assistance from a reluctant Bank of England even after the regulatory authorities had given assurances that the bank was solvent. This announcement sparked a run on the bank until the government moved to offer a guarantee to all deposits and that this would not be restricted to the normal limit of the Financial Services Compensation Scheme (FSCS). Although rumours developed about some other banks, the problem was focussed only on Northern Rock. As the problem was contained, in this respect a true systemic bank run was avoided although what might have happened had the government not announced its full guarantee of deposits at all banks in similar circumstances is open to question. For a detailed timeline on the crisis see Hamalainen and others (2008) and Treasury Committee (2008).

Central Thesis

The Northern Rock episode will become a major case study in the origin and management of bank crises. Our purpose here is to offer an assessment by focussing on the multidimensional nature of the episode. The central thesis is summarized as follows:

1. Northern Rock had a unique business model in that securitization (originate-and-distribute) was a central part of the bank’s overall

business strategy. While many banks securitize assets at the margin, the uniqueness of Northern Rock was that securitization, and a reliance on short-term market funding, was the central feature of its business model.

2. An inherent property of this business model was that it exposed the bank to a LPHI risk. The bank became heavily dependent on short-term funding in the money and capital markets, while no one predicted that liquidity in the markets would suddenly evaporate on a large scale. This was the nature of the LPHI risk.
3. While the business model was successful for some years, the LPHI risk eventually emerged in the context of global financial turbulence focussed initially on subprime mortgage lending in the United States. As Northern Rock had no part in this it might be claimed that it became an innocent victim of this turbulence. However, the chosen business model exposed the bank to a LPHI risk associated with a drying up of liquidity in the London financial markets.
4. The institutional structure of regulation and supervision in the banking sector needs to be revisited. A key issue is whether the post-2000 regime (which allocated responsibility for prudential regulation of banks, oversight of systemic stability, and the operation of the LOLR function to different agencies) needs to be changed, or whether it is the operation of the current model that needs to be improved within the existing structure. This raises the issue of whether there is a fault line in this separation of powers.
5. The Northern Rock episode has revealed a unique new role of the government in effectively overruling the established FSCS by intervening to guarantee all deposits at a troubled bank. The government's intervention in the Northern Rock case casts doubt on the credibility of any planned revised version of the FSCS. This will undoubtedly become a key issue in any future crisis, whenever and however it might occur.
6. Attempts were made to find a private sector solution (Resolution) of the Northern Rock failure. In the end, this proved not to be possible and the bank was taken into temporary public ownership, which in turn raises issues regarding competitive neutrality, etc.
7. Reform of a structural nature is needed in five main areas with respect to: insolvency arrangements for banks, Resolution arrangements in the case of failed banks, deposit protection arrangements, a PCA regime, and crisis management arrangements.
8. If a holistic approach to reform of institutional structure were to be adopted along the lines of the government's consultation paper

issued early in 2008, this would represent one of the biggest reform programs in the institutional arrangements for bank supervision ever adopted by any country in one move.

The Context of Financial Market Turmoil

The financial market turbulence during the middle months of 2007 was a particular problem for all banks that had securitization as a major part of their business strategy, most especially if it was on the scale of that of Northern Rock. In particular, there was a sharp decline in the appetite for major asset classes, uncertainty increased with regard to counterparty risk in the interbank market and other wholesale funding markets, banks became uncertain about their own potential exposure to their off-balance-sheet vehicles and the extent that they might need to absorb securitized assets on to their own balance sheets, some markets (such as the commercial paper market) closed altogether, and liquidity evaporated in all asset-backed securities (ABS) markets. Furthermore, while some new financial instruments had the purpose of shifting credit risk, two limitations became apparent during the financial market turbulence during 2007: credit risk was not always shifted as much as had been envisaged and to some extent the shifting of credit risk came at the expense of enhanced counterparty risk and liquidity risk, which ultimately transforms into a funding risk.

Above all, both the primary and secondary markets in sub-prime mortgage securities effectively closed and concern developed over the exposure of some banks in the market. There was uncertainty, for instance, about which banks were holding mortgaged-backed securities (MBSs) and collateralized debt obligations (CDOs). The governor of the Bank of England has likened the drying up of wholesale funding opportunities to the equivalent of a bank run. In particular, some banks that were dependent on securitization programs encountered serious funding problems because of all these uncertainties. Issuing banks and their conduits faced both a liquidity constraint and a rise in the cost of funding as it became increasingly difficult to rollover short-term debt issues. Liquidity in the interbank markets also weakened and a tiering of interest rates emerged during the summer. At one time, for instance, the London interbank offer rate (LIBOR) in sterling rose to 6.74% compared with the Bank of England's Bank Rate of 5.75%.

Banks encountered funding difficulties not the least because of their uncertain exposure to the weakening MBS market, or because of their commitment to provide lines of credit to MBS holders. There was also concern that some banks would be required to hold on their balance sheets

mortgage assets they had originally intended to securitize and sell. Overall, there was a sharp movement away from the MBS market.

All of this created considerable market uncertainty in the summer months of 2007 which led to a sharp fall in many asset classes, considerable uncertainty as to the risk exposure of banks, credit markets dried up and most especially those focussed on ABS, and liquidity dried up in the markets for MBSs and CDOs. Overall, uncertainty emerged over the true value of credit instruments (partly because the market had virtually ceased to function effectively) and the risk exposure of banks. As a result, a loss of confidence developed in the value of all ABS on a global basis. This was the general context of some banks (and notably Northern Rock) facing funding problems.

The liquidity problem became serious because securitization vehicles such as conduits and structured investment vehicles (SIVs) were funding the acquisition of long-term mortgages (and other loans) by issuing short-term debt instruments such as asset-backed commercial paper. As liquidity dried up, banks could not finance their off-balance-sheet vehicles and were forced to take assets back on to the balance sheet or hold on to assets they were planning to securitize. For a time, the London interbank market effectively froze as banks began to hoard liquidity. This developed for three main reasons: banks became increasingly concerned about potential counterparty risks, they were uncertain about their own potential liquidity requirements given the lines of credit offered to their own off-balance-sheet securitization vehicles, and concern developed about potential reputation risks in the event that their own subsidiaries would become either insolvent or subject to severe funding problems in the wholesale markets. All this effectively amounted to a process of reintermediation.

The Rescue Operation

A traditional role of a central bank is to act as a LOLR to illiquid but solvent banks. The three parties in the Tripartite Committee (the Treasury, Bank of England, and FSA) were emphatic that Northern Rock was solvent and that, even though it was not a particularly large bank, its failure would be systemically significant and potentially damaging to financial stability. In order not to aggravate a temporary liquidity problem of a bank by panicking depositors to withdraw funds, in the past intervention had been undertaken by the Bank of England on a covert basis and without publicity at the time. The Bank now judges (though this has been challenged by the EU Commission) that current requirements of transparency mean that any such support must be made public.

Under the Tripartite Memorandum of Understanding (MoU) between the Treasury, FSA, and Bank of England, in a financial crisis the ultimate responsibility for authorization of support operations by the Bank of England rests clearly with the Chancellor of the Exchequer. There are two main reasons for this. First, it is in the nature of a political decision whether or not a bank is to be supported. Second, any such support exposes the taxpayer to a potential risk in the event that the institution proves not to be solvent.

In the event, Northern Rock received six forms of official support:

1. The Bank of England's role of LOLR was activated on September 14 at a penalty interest rate of 1.5% above Bank Rate,
2. The government subsequently offered to guarantee all existing deposits at Northern Rock,
3. The LOLR role was subsequently extended in that Northern Rock was given an additional unlimited facility at the Bank of England secured on the collateral of all Northern Rock assets,
4. On 9 October the government applied the guarantee not only to existing deposits but to all new retail deposits,
5. The guarantee applied not only to retail deposits but to most other creditors of the bank,
6. The loan facility would remain available to any buyer of the bank.

Combined, this was an unprecedented package of official support and the first time ever that any British government had guaranteed bank deposits. Although, at the time the liquidity support was announced, both the FSA and the Bank of England announced that the bank was solvent, depositors began to withdraw funds on a large scale. It was only after the government announced a full guarantee of all deposits that the drain ended. The Bank of England has argued rather unconvincingly that support could not have been given earlier because of the stigma attached to such borrowing. The point has been put by the Bank of England as follows: "These events have illustrated the risk that, at times of stress, stigma can attach to banks that call on central bank facilities potentially undermining their usefulness", (Bank of England 2007a).

A Multidimensional Problem

The Northern Rock episode will prove to be a major case study in many aspects of financial regulation and supervision and the viability of particular business models. The particularly significant aspect of this episode

is that it was multidimensional in that several issues at the center of financial regulation and supervision came together in a single case study. Furthermore, it revealed major fault lines in each of the dimensions. Several key dimensions are identified:

1. **The low-probability-high-impact (LPHI) risk.** As has been argued, Northern Rock had a particular business model that exposed it to a low-probability risk (that liquidity would dry up in the interbank and commercial paper market) but one that would have a high-impact (inability to continue to fund its business operations). Northern Rock had a particularly hazardous business model that seems not to have been sufficiently monitored by the supervisory authority.
2. **Incomplete credit risk shifting.** Over the previous few years, various new instruments had developed to enable banks to shift credit risk off their balance sheet and on to others. However, in the financial market turmoil of the summer of 2007, it became apparent that the risk-shifting characteristics of these instruments were less than complete. Allegedly bankruptcy-remote vehicles (Special Purpose Vehicles, Conduits, etc.) seemed not to protect securitizing banks from the credit risk of securitized assets. This was partly because banks became concerned about the reputation risk associated with allowing such vehicles to default. Furthermore, the potential liquidity problems attached to such vehicles were underestimated or not considered at all.
3. **Deposit protection.** Major fault lines were revealed in the British FSCS. As argued below, the coinsurance principle (whereby protection was less than complete: at the time, only the first £2000 of a deposit was fully protected and then only 90% of the value of deposits up to a limit of £33,000) meant that the FSCS would not prevent what it was designed to prevent, namely, the withdrawal of deposits when doubts emerged about the safety of a particular bank. This proved to be the central fault line in the system.
4. **Structural weaknesses.** In addition to the inconsistency in deposit protection arrangements, the UK suffered from two other major structural weaknesses: (i) it was almost alone among G7 countries in not having a special bank insolvency regime, and (ii) there was no clearly defined *ex-ante* Resolution model in the case of failing banks. A particular problem with the latter is that uncertainty is created and, in the event that bids are invited to “rescue” a failed bank, potential bidders are prone to bid for economic rents against

the interests of the taxpayer. This became evident in the case of Northern Rock and the long-drawn-out procedure the government instigated that eventually led to the rejection of all the bids that were made and the temporary nationalization of the bank.

5. **Institutional structure of supervision.** In 1997, the incoming Labour government announced a major overhaul of the institutional arrangements for financial regulation and supervision. Since the 2000 Financial Services and Markets Act, the UK has adopted a *unified* supervisory model (Llewellyn 2004). In particular, the supervision of banks was taken away from the Bank of England and all regulation and supervision of financial institutions and markets was vested in the newly created FSA. Many analysts at the time argued that this could prove to be problematic in times of crisis as, while responsibility for systemic stability and the provision of market liquidity remained with the Bank of England, it was no longer to be responsible for supervising the institutions that made up the system. Although a crisis management structure was put in place (the Tripartite Committee), this clearly did not work well in the first crisis to emerge in the new regime.
6. **Role of government.** The government intervened in an ad hoc manner by guaranteeing all deposits held at Northern Rock (and, by implication, all banks in similar circumstances) that was contrary to the well-established FSCS. This raises issues of credibility regarding whatever new deposit guarantee system is in place.
7. **Moral hazard.** Particularly serious moral hazard issues have been created with respect to depositor protection and the role of the government.

The significance of the Northern Rock affair is, therefore, that it is multidimensional in nature and involves many significant issues related to the regulation and supervision of banks in the interests of financial stability and the protection of depositors. Virtually everything that could go wrong did go wrong. This is the ultimate significance of the Northern Rock case, and why it is such an important case study. We now consider each of these dimensions in turn.

Risk Matrix: LPHI Risks

LPHI risks are among the most difficult to manage, and the history of banking crises around the world (both individual and systemic) indicates that a high proportion occur when a bank (banks) finds itself operating in

this area of the probability-impact matrix. This is partly because it tends to induce *disaster myopia* where low-probability risks (even if they have high impacts) are discounted altogether and behavior is implicitly based on the assumption that the probability is zero. These are difficult risks to handle also because it is not realistic to price for them: this might, for instance, involve an attempt to price a risk that could destroy the bank!

Although the FSA adopts a similar methodology in its risk-based approach to supervision, supervisors can also be subject to the same disaster myopia in the case when LPHI risks emerge. It may also be difficult for a supervisor to intervene when detecting a LPHI risk, most especially if, to date, the bank's behavior has yielded good results and no obvious problem has yet emerged.

Our central thesis is that Northern Rock's highly focussed business strategy involving a high and unusual dependency on securitization and short-term wholesale market funding exposed it to such a LPHI risk. As put by Chick (2008): "This is fair-weather balance sheet, extremely vulnerable to a change in market sentiment." The drying up of liquidity in the relevant London and international markets was a very low probability event (it is difficult to recall when it last occurred) and yet would have a large impact and be serious for banks with business models that relied heavily on securitization and short-term funding through these markets. It would also appear that, while some generalized warnings about liquidity risks had been made from time to time, supervisors did not take action in the case of Northern Rock that suggests that they may have been subject to disaster myopia.

The Northern Rock Business Model

A central theme is that the ultimate problem for Northern Rock was its particular business model that exposed itself to a LPHI risk. Northern Rock pursued a strategy of fast growth in mortgage lending based on a high proportion of wholesale market funding together with planned securitizations of its mortgages. The Bank's funding strategy was based on four sources of finance: retail deposits (its traditional funding source), securitization, covered bonds, and general wholesale money market funding.

For several years prior to the crisis the growth of mortgage lending at Northern Rock had averaged around 20% while the inflow of retail deposits was modest. The bank's mortgage lending in the first half of 2007 was close on 50% higher than a year earlier. In absolute terms, the bank's assets expanded from £15.8 billion in 1997 to £101 billion in 2006 while retail deposits rose by only £12.7 billion. The rising "funding gap" was financed through securitization, covered bonds, and other wholesale market

funding to the extent that, while in 1997 (when the former mutual building society converted to bank status) retail deposits accounted for 62.7%, this had declined to 22.4% in 2006. The bank's SPV subsidiary (Granite) accounted for 50% of the bank's funding. Two fundamental structural changes in the bank's business strategy evolved: a shift toward securitized assets on one side of the balance sheet, and a shift to various forms of wholesale funding on the liabilities side of the balance sheet. Furthermore, the bank took out only limited liquidity insurance through, for instance, agreed lines of credit with other banks. Northern Rock had a significantly higher proportion of wholesale funding (62%) compared with the average of 45% for other banks.

This model proved to be viable for several years as short-term funding could be rolled over on normal terms. However, the overall LPHI risk in this strategy was a combination of three micro risks: (1) the bank or its conduits would be unable to rollover maturing funding, (2) the cost of such funding would rise relative to the yield on mortgage loans that it kept on the balance sheet, and (3) it would be unable to securitize those mortgage assets that it intended to. In the last-mentioned case, the bank would be forced to maintain the assets on the balance sheet and seek nonsecuritization funding. The LPHI risk was, therefore, that either it would be unable to rollover its short-term funding in the event of a serious liquidity squeeze or the necessary rollover funding could be secured only at high interest rates. In the event, all three major wholesale funding markets for Northern Rock collapsed and were effectively closed to it.

Deposit Protection

The Northern Rock affair brought to the surface underlying weaknesses and inconsistencies in the UK's FSCS, designed to compensate depositors in the event of a bank's insolvency. Deposit protection serves three main purposes: (1) to offer a degree of social protection to holders of small bank deposits, (2) to remove the incentive for contagious bank runs, and (3) to make it easier and, to some extent, less costly to allow banks to fail. Goodhart (2008), on the other hand, argues that the avoidance of bank runs was never part of the rationale of the UK deposit protection regime.

Two central issues, both of which emerged in the debate about Northern Rock's predicament, relate to *coverage* (what limit should be placed on the size of deposits protected, and whether, for instance, inter-bank deposits should be included), and the element of *coinsurance* (i.e., whether cover within the limit is to be less than total). Herein lies the

central dilemma of deposit protection. If coverage is total (there is no coinsurance) the standard moral hazard arises. On the other hand, if coverage is less than complete, and there is an element of coinsurance, depositors will withdraw deposits in the event that doubts arise about the solvency of a bank. Depositors are likely to withdraw funds in the event that they are exposed to *any* risk of losing any amount (even small) of their deposits. In which case, partial insurance is likely to be ineffective. The dilemma, therefore, is that deposit protection is likely to be either ineffective if it is partial, or subject to moral hazard in the event that it is complete.

At the time, the UK FSCS (set out in the 2000 Financial Services and Markets Act) was that the first £2000 of a deposit would be compensated in full while the cover was limited to 90% for the next £33000. No cover was available for deposits above the limit of £35000. As an interim measure, and as a first step in a wider reform program, in October 2007 the government announced that deposit protection would be extended to 100% for deposits up to £35000: the previous coinsurance principle has been abandoned in this interim reform measure.

Several possible reforms need to be considered, including: the coverage; whether there is to be an element of coinsurance; the speed with which compensation is paid in the event that a bank becomes insolvent, and the pricing of deposit protection and, in particular, whether what banks pay should be related to their own risk characteristics. Several countries (including the United States, France, and Canada) currently adopt such a pricing model that has the advantage of at least mitigating the moral hazard that arises through subsidizing risk. Other issues known to be under consideration relate to the possibility of transferring deposits to another institution immediately a crisis emerges with a bank and, as is the case with the failure of utility companies, the possibility of maintaining critical bank services (e.g., direct debt payments) during the period any workout is being organized. The government has also announced that consideration is being given to insolvency law so that, for instance, depositors will be placed ahead of other unsecured bank creditors in the event of a bank's insolvency.

Bank of England Money Market Operations

A central issue that arose during the turmoil in financial markets in the summer of 2007, and the unfolding predicament of Northern Rock in particular, focussed on the role of central banks in intervening in the money markets. Unlike the Federal Reserve and the European Central Bank (ECB), no liquidity injections were made by the Bank of England at

the onset of the crisis. We refer here not to the role of LOLR to particular institutions, but to general market operations to smooth system liquidity and to influence the level of short-term interest rates in the money markets. The norm for the Bank of England was for it to restrict its operations to the overnight market and to accept only a very narrow range of top-class collateral. However, there are differences between central banks in both dimensions: maturity and collateral. While the Bank of England normally restricted its intervention to the overnight market and accepted only a narrow range of collateral, the ECB and the Federal Reserve have at times been prepared to intervene in longer maturities and against a wider range of collateral.

It has been argued that, had the Bank of England adopted a different intervention strategy in the markets (range of maturities, etc.) the problems of Northern Rock might have been avoided. In fact, in evidence to the House of Commons Treasury Committee, the chief executive of the FSA argued: “it clearly is the case that if liquidity in smaller amounts had been made available to Northern Rock earlier, then it is quite possible it would not then have subsequently needed to apply to the lender of last resort facility.” Furthermore, the British Bankers Association argued in similar vein: “had the Bank acted . . . at the beginning of August, then many of the problems affecting the money markets in general and Northern Rock in particular might have been mitigated.” It also became evident that the Bank of England adopted a different strategy to that of the ECB and the Federal Reserve.

Two key issues arise: (1) in what maturity ranges is the central bank to operate—in particular, the overnight market (as has traditionally been the case in the UK) or a wider range of maturities (out to three months) as is often the case with some other central banks such as the ECB; and (2) against what type of collateral is the central bank to intervene (see Goodhart 2007, 2008). A particular issue with respect to the latter in the months of financial market turmoil in the summer of 2007 was whether the central bank would accept, for instance, mortgage-backed instruments as collateral in its interventions in the money markets. This is a key issue as it determines the extent of risk that the central bank takes through its interventions. Both issues became the center of debate during the period of financial market turmoil in 2007.

The Bank of England initially took a restrictive view. In particular, it argued against intervening in longer maturities than the overnight market for two main reasons:

- The Bank judged that markets would quickly reestablish valuations so that banks could begin to securitize mortgage assets held on their

balance sheets. In any case, banks were judged to be strong enough to take securitized assets back on to their balance sheets.

- Longer-maturity intervention would create a moral hazard in that it could be interpreted as bailing out banks that had adopted a high-risk business strategy and this could encourage banks to adopt such high-risk strategies in the future. The Bank seemed to take the view that intervening in the three-month repo market, and against a wider than normal range of collateral, would represent a bailout of would-be sellers of illiquid collateral. It might imply, for instance, the Bank accepting as collateral assets that the banks could not sell in the market as a means of raising cash. It judged that it would both reward risk-taking by banks and penalize those who had not taken such risks.

However, both the Federal Reserve and the ECB took a different view and did in fact intervene (sometimes on a large scale) in the three-month market and against a wider range of collateral including mortgage-backed assets. Overall, the Bank of England was late in the provision of systemic liquidity support.

The Bank of England subsequently changed its operating procedures and relented to pressure to intervene more widely and against a wider range of collateral. On 20 September it decided to offer £10 billion for three-month maturity against a wider range of collateral including mortgage-backed assets in a series of planned auctions. The Bank offered to supply £10 billion in the form of three-month loans in a series of four weekly auctions. This facility would, however, carry a penalty interest rate and the collateral offered would be at a discount—a “hair cut.” In the event, there were no takers in the auction. There were several reasons for this. First, banks took the view that stigma would attach to such borrowing from the central bank, if the names of the banks became known, as markets might judge that these banks were in difficulty. After all, the change in stance of the Bank of England occurred only after it had become known that Northern Rock was in trouble. Second, the terms of the transactions were unattractive in that the Bank of England would charge at least 1% above Base Rate for the facility. Third, it was also evident that some British banks with operations in euro-area countries had already been making use of the more flexible ECB facilities: a form of money market arbitrage.

More fundamentally, in April 2008 the Bank of England announced a major temporary change to its operating procedures by standing ready to issue government securities to banks in return for swaps against mortgage assets as a means of increasing liquidity in the markets. This could be done

to a total of £50 billion (one of the largest operations ever for the Bank) though market commentators suggested that in practice this could rise to around £100 billion. Various caveats were put in place to limit the risk to taxpayers.

Status of the Bank of England

Several criticisms have been levelled against the Bank of England's actions and stances during the evolving Northern Rock crisis in September and October of 2007:

- It is alleged that the Bank operated too late and generally underestimated the nature of the financial market turmoil and its specific impact on Northern Rock.
- Excessive emphasis was given to the dangers of moral hazard at a time when the markets in general, and Northern Rock in particular, were particularly vulnerable. Goodhart (2007) has argued that: "sticking to proper principles in a crisis may be admirable but it can be a dangerous game to play". The contrary argument is that it is precisely in such circumstances that the moral hazard implications of intervention need to be emphasized.
- The Bank has been accused of being excessively restrictive in the range of maturities and instruments against which it intervenes in the money markets to ease liquidity and interest rate pressures at a time when three-month LIBOR had risen significantly above the Bank's intervention rate. This is in contrast to the interventions of the ECB and the Federal Reserve in their respective money markets. In particular, it would not accept mortgage-based collateral.
- Northern Rock, and some commentators, has argued that the problems of Northern Rock might have been alleviated, and the bank run avoided, had the Bank been more willing to intervene in the three-month interbank market and against a wider range of collateral.
- The Bank has been criticized for inconsistency in that it later conceded to pressure to liberalize its intervention policies by widening both the maturities and the range of instruments for collateral.
- It has also been alleged that, early on in the evolution of the Northern Rock crisis, the Bank obstructed a possible takeover by Lloyds TSB.

On the other hand, such counterfactual judgments as to what might have happened had the Bank intervened earlier and more flexibly in the money

markets, and taken a more accommodating stance with respect to potential takeovers, are always difficult to resolve.

The Bank of England's view on some of these issues may be summarized succinctly as follows:

- Intervention in the money markets (along the lines of the ECB and Federal Reserve) would have created serious moral hazard: it could have created a perception that financial institutions (having adopted a high-risk profile) would always be rescued; it would have effectively subsidized risk taking, and create a one-way option with respect to future risk taking.
- The Bank stated that it would have preferred to intervene in a covert manner as it had in the secondary banking crisis in 1974. However, in evidence to the House of Commons Treasury Committee, its judgement was that intervention in the case of Northern Rock might have faced serious legal obstacles: it could have breached both the Take-Over Code and the EU Market Abuse Directive, as LOLR operations would need to be disclosed under the Insolvency Act. In particular, any support intervention would have to be disclosed and this could have made the position worse for Northern Rock. Combined, these placed serious constraints on Bank of England covert support operations. Whether these problems should have been identified and addressed earlier is another issue.
- With respect to Lloyds TSB, and an alleged possible takeover of Northern Rock, the Bank's view was that it would not have worked in the absence of a full-scale guarantee that it was not prepared to offer. This could have amounted to a potential commitment to effectively take the bank into public ownership for which the Bank of England had no legal authority.

The central issue emphasized by the Bank of England was that the various interventions being advocated by some would have created serious moral hazards.

Institutional Structure of Supervision

A central issue revealed in the Northern Rock episode, and one that needs to be addressed in its various dimensions, is the adequacy of supervisory arrangements and crisis management. This has three main dimensions: (1) the institutional structure of agencies and their responsibilities as between the Treasury, FSA, and Bank of England; (2) the actual conduct of supervision in the case of Northern Rock; and (3) the effectiveness and

efficiency of crisis management. Serious weaknesses have been revealed at each level and reform is needed.

Institutional Structure

With respect to institutional structure, in any regulatory/supervisory regime four areas need to be addressed: prudential regulation of financial firms, systemic stability, the LOLR role, and conduct of business regulation and supervision. Always and everywhere the central bank is charged with oversight of systemic stability. It is usually the case that it is responsible for the LOLR role though this depends upon the nature of any intervention and specifically whether a failing bank is to be rescued in which case responsibility would be shared with the Ministry of Finance because taxpayer money would be involved.

A key question is the location of prudential supervision, and in particular whether or not the central bank is to be the prudential supervisor of banks and, if so, whether this should also encompass all other financial institutions such as in the case of the Netherlands and Ireland. For reasons outlined elsewhere (Llewellyn 2004), there is an overwhelming case for having prudential regulation and supervision of all financial firms located in a single agency. A key issue is whether this should, or should not, be the central bank. For a review of international experience, and an analysis of recent trends, see Goodhart and others 1999, Llewellyn 2004, Carmichael and others 2005, Healey 2001, Luna Martinez and others 2003, and Oosterloo and others 2003. Virtually all logical options can be found somewhere in the world which suggests there is no obvious single correct model. It has been argued elsewhere (Llewellyn 2004) that institutional structure (who is responsible for what) is very much of second-order importance in stable market conditions. The key issue is what institutional structure is likely to be optimal in a financial crisis, and most effectively able to undertake crisis management.

The current structure in the UK was established as one of the early initiatives of the incoming Labour government in 1997. In terms of distress and crisis management, the new model revealed major weaknesses the first time it was tested in this crucial area. It would appear that the tripartite arrangement was slow to be activated. It is also clear from some public statements and evidence to the House of Commons Treasury Committee in October 2007, that differences had emerged between the FSA and the Bank of England, particularly with respect to the Bank's money market operations: the FSA seemed to take a different view from the Bank with respect to the moral hazard problem.

A central issue is whether the current institutional structure is fundamentally flawed, or whether its operation needs to be refined and streamlined most especially in the area of crisis management. In particular:

- Whether it is optimal to have the central bank responsible for systemic stability while not at the same time being responsible for prudential regulation and supervision of the institutions that make up the system.
- Equally, whether it can act as an effective LOLR without having prudential oversight of banks.

One argument that has been put, recognizing the weaknesses inherent in separation, is that the LOLR role should be transferred to the FSA. A more plausible approach would be to move prudential regulation of all financial institutions from the FSA to the Bank of England. An additional advantage to this is that the central bank necessarily gains information advantages about the current state of banks and markets through its daily money market operations. This is also recognized by De Nederlandsche Bank (see Oosterloo, et al. 2003). The Bank of Japan has also argued that, after the turmoil of 1997, it cannot be expected to act as the LOLR unless it can check the financial condition of banks at first hand. Two current models for this are the Netherlands and Ireland though in both cases the central bank has only a minor role in the conduct of monetary policy by virtue of being members of the euro area.

In practice, there will be no major changes to the current institutional structure (*unified* agency where the FSA is responsible for both an *integrated* prudential regulation and conduct of business regulation) because there is too much political capital invested in it. Indeed, in evidence to the House of Commons Treasury Committee on 25 October 2007, the chancellor virtually ruled this out. Nevertheless, the role of the Bank of England needs to be considered and the possibility of an alternative structure could be an issue for the longer term.

What in practice is likely to emerge is a streamlining of the work of the different agencies, a refinement of the crisis-management function, more effective information-sharing, and more clearly defined procedures, but all within the current overall institutional structure. This focus is too narrow and a more radical reform to institutional structure should be on the agenda.

Conduct of Supervision

As for the conduct of supervision in the Northern Rock case, several weaknesses were revealed. Firstly, and notwithstanding the exceptional business

model of the bank, no fully comprehensive review of the bank had been made for at least 18 months. Second, and notwithstanding general public warnings made about liquidity risks by the Bank of England and the FSA, inadequate stress tests were applied to Northern Rock. Third, stress testing by Northern Rock was not based on sufficiently adverse conditions or extreme assumptions. Fourth, the delay has already been noted. In addition, it seems strange in retrospect that as late as June of 2007, the FSA lowered the bank's required capital ratio that enabled the bank to pursue asset growth even though it was known that financial problems had been revealed.

The regulatory authorities (most especially the FSA) did not seem to respond to market signals that the bank might have become vulnerable (Hamalainen, et al. 2008). Its exceptional and sustained asset growth (substantially out of line with its peers) should have been a warning. In particular, the collapse in the bank's share price (from 1200 in January 2007 to 800 in July) was a signal from the market that there were doubts about the bank's position. Furthermore, the Bank of England has since claimed that while they were aware of the risks attached to Northern Rock's business model, the Bank itself had no powers to intervene.

Crisis Management

When the FSA was created, and banking supervision was taken from the Bank of England, it was recognized that there would need to be a formal set of arrangements and procedures for handling failing banks. This was formalised in a MoU between the Treasury, Bank of England, and FSA. This Tripartite agreement was based on five main principles: there was to be a clear division of responsibilities, appropriate accountability arrangements, the avoidance of duplication of responsibilities, exchanges of relevant information, and mechanisms for crisis management. In the event, the first crisis to emerge in the new regime revealed weaknesses and flaws in each of these areas. In some areas, there was some uncertainty about the legal position, for example, intervention powers; whether, in the event that the Bank of England undertook covert intervention in support of the bank, this would need to be made public, and whether such intervention might also infringe EU competition law.

There were several ways in which the crisis was managed badly: there were public disputes between the three agencies, communication arrangements were clearly problematic, there was no clear definition about which agency was responsible for initiating action, and the government delayed announcing its guarantee of Northern Rock deposits until after it was announced that the bank would receive the Bank's support.

Role of the Government

A unique feature of the Northern Rock affair was the role of the government. When the supervisory authorities' announcement that the bank was solvent and safe failed to abate the run on deposits, the government took the unprecedented move of guaranteeing all deposits (irrespective of size). This latter requirement was also to be extended to all new deposits and customers although a fee would be charged to Northern Rock plus a percentage of any new deposit inflows. This was presumably to allow the bank to offer services to customers while at the same time preventing the bank (shareholders) benefiting from the Bank of England's support.

In effect, the taxpayer absorbed the risk of Northern Rock becoming insolvent. This amounted to a socialising of banking risks. In this event, the government would effectively have a claim over Northern Rock assets. It also implied that the taxpayer took the risk of a fall in house prices which, in the event of insolvency, could mean that, in the case of borrowers defaulting on high loan-value ratios, the value of some of the houses taken into government possession would be less than the defaulted mortgage. This difference would be a cost to the taxpayer.

There are substantial implications of this unprecedented intervention by the government. First, it will have created a clear perception that depositors in any bank subject to a run of deposits will be protected in full. In effect, depositor risk has been socialized and the FSCS has been made redundant. Second, it undermines the credibility of the formal FSCS. Third, it is likely to undermine the credibility of any subsequent scheme that is likely to emerge. Fourth, with *de facto* total protection cover, the standard moral hazard has been intensified. For all these reasons, the long-run implications of the unprecedented guarantee of the government are substantial.

An important precedent has been created in that, under some unspecified circumstances, the government will step in to guarantee bank deposits over and above whatever the FSCS specifies. It must be an open question in depositors' minds what future circumstances will call forth such a guarantee. The moral hazard is that, once the principle of such guarantees has been established, it is difficult to limit its applicability in depositors' perceptions. Is it, for instance, reasonable to assume that such a guarantee would be forthcoming in all future "unusual circumstances"? The government has uncovered a minefield of potential moral hazard because it is unknown what the circumstances would be where the government would *not* offer a similar guarantee to that in the Northern Rock case.

The Resolution of the Crisis

Initially, the government attempted to find a private market solution and bids were invited. Four particular conditions were set by the government: (1) the government (taxpayer) should share in any upside gain to the buyer, (2) new capital was to be injected, (3) repayment of Bank of England loans was to be made within three years, and (4) bidders needed to present a viable business plan.

After a protracted period during which bids were invited to purchase Northern Rock, and against the political instincts of the government, the bank was eventually taken into temporary public ownership. This was one of the biggest nationalizations ever undertaken in the UK and, as argued below, this amounts to an ad hoc Bridge Bank mechanism. An independent commission would decide upon an appropriate price to be paid to shareholders though this is required to be made on the basis of excluding the valuation effect of government guarantees and Bank of England support. Clearly, this raises a problem in that, while the bank's assets might have considerable value, the value of the equity could be effectively zero given that the bank could survive only on the basis of the government guarantee of deposits and Bank of England funding.

There are several reasons why, in the final analysis, none of the private bids was deemed to be acceptable: market conditions generally were uncertain and volatile and the demand to buy a mortgage bank was limited; market uncertainty at the time made it difficult to price the bank; the housing market in the UK was becoming considerably weaker than in the past and there were market expectations that house prices could fall quite sharply thereby increasing the probability that some mortgagees would default on their loans; one of the government's conditions (that the loans and support the bank had received) needed to be repaid within a reasonable period was clearly a serious legacy problem for potential bidders; any successful bidder would be required to inject new capital, and there was some uncertainty over the legal status of Granite (Northern Rock's off-balance-sheet vehicle for the securitization of the bank's loans).

There was also public disquiet in that the very small number of bidders were tending to make low bids, which meant that taxpayers retained the risk that their own loans would not be repaid (perhaps because of the risks in the housing market that might reduce the true value of the bank's mortgage assets), while at the same time there was a potential (though by no means certain) upside gain to any successful bidder. The concern was that the risks would be socialized while the potential profits would accrue to the successful private sector bidder.

There are some advantages to the temporary public ownership of the bank over and above the fact that, given the flawed Resolution arrangements (or rather their absence), there seemed to be no alternative: the government (the risk-taker) would have some influence on the strategy of the bank in the period of public ownership, and this could be used to ensure that taxpayers' support would be repaid; as has been the case in some other countries when public support has been given to failing banks, there could eventually be a net profit for the taxpayer; the state could allow sufficient time for market conditions to improve before again inviting private market bids for the restructured bank; no fire sale of assets would be required, and there would be minimal disruption to the bank's day-to-day business and that of its customers. For a general discussion of the advantages and disadvantages of the nationalization route see Herring (2007).

While the taxpayer remained exposed to the risks in the mortgage market, this would also have been the case had one of the private bids (including one from the existing management team) been successful.

Structural Flaws in the UK Regime

A central theme has been that four major and long-standing structural weaknesses in the UK regime made a Northern Rock problem inevitable at some stage:

1. The FSCS was fundamentally flawed.
2. The UK had no special insolvency arrangements for banks but applied the long-drawn-out normal insolvency arrangements for other companies.
3. There were no clearly defined *ex-ante* Resolution procedures in the event of failing banks.
4. The institutional structure of regulation (and the split between the Treasury, FSA, and Bank of England) proved to be an uncertain arrangement in time of crisis.

These have been recognized by the government that in January 2008 issued a comprehensive consultation process jointly with the Bank of England and the FSA ("Financial stability and depositor protection: Strengthening the framework") outlining its proposed reforms in each of the flawed areas. See HM Treasury (2008).

The arrangements were fundamentally flawed for several reasons: the FSCS would not prevent bank runs because of its coinsurance principle,

there was no arrangement to ensure that, in the event of a bank failure, there would need to be arrangements to ensure there was only minimal disruption to customers in the conduct of their normal banking business, partly because of the lack of a clearly defined bank insolvency model, the arrangements for deposit protection could not guarantee that payments would be made promptly thus exposing bank deposits to a liquidity risk. In particular, the legal position was that a bank could not be put into administration without freezing deposits.

Resolution Strategy: Structural Reforms

Given that a major reform program is on the agenda, it is instructive to consider the criteria that should be applied in any Resolution strategy for failed banks. We set out a set of ten criteria as follows:

- There should be minimal loss and/or risk to the taxpayer.
- Resolution arrangements should be based on a predictable model rather than being an ad hoc process.
- Resolution should be based on a viable business model.
- The business of the bank should not be interrupted.
- Shareholders should not be protected.
- The Resolution arrangements should not create moral hazard for the future.
- It should sustain systemic stability.
- The arrangement should be competitively neutral for other banks and should not infringe EU competition law: as it now stands, this implies that there needs to be a viable program for the eventual sustainability of the bank, any public support should be for a limited period, no further public assistance should be made available to the bank, (when relevant) there should be compensation for competitors, and it should reduce the capacity of the system.
- Employment considerations (and the protection of jobs) should not be a consideration in optimal Resolution arrangements.
- It should avoid the potential for any bargaining for economic rents.

Several fault lines have been identified by the Northern Rock crisis and these needed to be addressed irrespective of any response to this particular episode. If there is a positive outcome to the crisis it is that it has forced a consideration of these fundamental issues, which are more important than the details of the northern Rock case itself. On the basis of these fault

lines, we suggest the following package of related structural reform measures based on a holistic approach:

1. Deposit protection arrangements need to be restructured.
2. The government and regulatory authorities should institute a PCA program along the lines of the model applied in the United States, which has the force of law.
3. Insolvency arrangements for banks need to be reformed.
4. A clearly defined and predictable Resolution strategy needs to be instituted to replace the current ad hoc arrangement. Above all, this must ensure that there is no interruption to the day-to-day business of the bank or the interests of customers.
5. The crisis management arrangements need to be considerably refined.

Deposit protection

The central dilemma has been outlined above: coinsurance makes the scheme ineffective, while 100% cover creates a serious moral hazard as, in effect, risk is subsidized. Eisenbeis and Kaufman (2007b) also argue that weaknesses in the UK FSCS were at the center of the Northern Rock crisis. The answer is to create a regime of 100% cover up to a maximum amount (e.g., £50,000) while at the same time removing the moral hazard by a combination of: imposing risk-adjusted pricing of deposit protection (as with all other insurance!), a PCA program, and a formal Resolution procedure. We leave aside the issue of whether the scheme should be a funded scheme or, as at present, undertaken on a pay-as-you-go basis, though there is a strong case for a funded scheme even though this might put some strain on banks during the period when the fund was being built up.

PCA

A central feature of a PCA program is to make supervisory intervention more predictable by removing elements of discretion from the supervisory agency. A set of trigger points is defined (e.g., capital ratios or length of time a bank has used central bank liquidity support) that automatically lead to various forms of regulatory and supervisory intervention. The ultimate penalty (before insolvency is reached) is the closure of the bank. In practice, the triggers that lead to intervention vary considerably between countries (Herring 2007).

Insolvency arrangements for bank

For several years, the governor of the Bank of England has advised that current arrangements for declaring a bank insolvent is too long-drawn-out and can jeopardize the interests of depositors. A special arrangement

is needed for banks to avoid this. Under present arrangements, it is difficult to make speedy insolvency arrangements for banks and at the same time allowing a speedy payout to depositors. Under standard insolvency procedures that apply equally to banks, a creditor applies to place a business into administration, and the provider of liquidity support and the deposit protection fund have no higher status than other creditors. Bliss and Kaufman (2006) offer an analysis of the differences between insolvency regimes for banks and other companies in the United States.

Predictable resolution arrangements

Under the current regime, the final resolution of a failed bank is ad hoc and unpredictable as was found in the Northern Rock case. After an uncertain procedure for soliciting private bids for Northern Rock, the bank was eventually taken into temporary public ownership during which period taxpayer loans would be required to be repaid, and a business model developed to make a private sale eventually feasible. This amounts to something like an ad hoc Bridge Bank mechanism. Under the formal and predictable Bridge Bank model (as in the United States), at some point the failed bank is automatically taken over by an agency (in the United States it is the FDIC) before the bank has become insolvent or faces acute liquidity problems. The FDIC then charters a temporary bank for a period (though this could stretch into years) until such time as it can be restructured and made attractive for a private sale. An excellent overview of alternative Resolution strategies is given in Herring (2007), which also considers the case for preinsolvency intervention.

There are several advantages to a Bridge Bank model: it facilitates the control of unfair potential competitive advantage; it allows for the continuous operation of a bank without disruption of normal services for customers; it allows time to design an eventual cost-effective resolution of failed banks; in some cases it can maintain any existing franchise value of the bank; and it allows time for outside bidders to conduct due diligence when considering a purchase of the bank while in the temporary Bridge Bank status.

Crisis Management arrangements

The Tripartite arrangement clearly did not work well in the case of Northern Rock. On the assumption that the basic institutional structure of regulation and supervision is to be retained (i.e., the continued division of responsibilities between the FSA and Bank of England in particular), then it is clearly necessary for the current arrangements to be refined and made more certain and predictable with no ambiguity about agencies that are to be ultimately responsible and who does what and when!

New Institutional Structures

The British government has initiated a wide-ranging consultation process on structural reform. Its document (HM Treasury 2008) offers a comprehensive review of various options focussed on the structural weaknesses outlined above. A clear theme is the need for a clear, smooth, and predictable Resolution regime; reform of deposit protection arrangements; special insolvency arrangements for banks; and a revamped crisis management procedure. It is also recognized that, in any Resolution procedures, depositors needed to be protected which *inter alia* implies quick action and no disruption of normal banking services, (see Kaufman and Seelig (2006) for a discussion of how in the U.S. depositors are to be treated in failed banks). As argued above, it is recognized that a holistic approach to reform is needed.

The reform program needs to begin with deposit protection arrangements and, in particular, abandoning the coinsurance principle. In order to limit the resultant moral hazard, this needs to be accompanied by a special resolution model for banks, a reformed crisis management structure, and the institution of a PCA regime. The PCA program needs to be an integral part of any reform program so that, having passed through a set of trigger responses, a bank is taken into the Resolution procedure before it becomes insolvent. The main rationale is that this would lower claims on any deposit protection fund (if there is such a fund) or calls on the banking system to finance the payment of protection to the depositors of failed banks. It is hoped, therefore, that this would make the deposit protection arrangements redundant.

At the time of writing, it was not clear what strategy the government would adopt in its reform program. However, “the UK authorities are considering a range of tools, with the aim of avoiding any necessity (in the future) for temporary nationalisation,” (HM Treasury 2008):

- Power to initiate transfers of business out of a failing bank in support of private resolution;
- The creation of a special insolvency regime for banks;
- Arrangements to ensure continuation of services for customers;
- The creation of the Bridge Bank concept with a view to an eventual private sector solution;
- The possible use of funds of the Financial Services Compensation Scheme (FSCS) to support resolution;
- Ensuring a rapid payout to depositors if a claim is made; and
- Arrangements to keep the healthy parts of a failing bank in business.

These issues are in the public domain for consultation: no final decisions have been made though it would appear that a package of reforms would be forthcoming.

Conclusions

Our central theme has been that the Northern Rock episode is a multidimensional problem and reflects a complex set of interrelated problems. A second central theme has been that the Northern Rock episode revealed several fault lines in several areas. If there is a positive outcome to the episode it is that attention has been drawn to these serious fault lines. They need to be addressed and with some urgency. In terms of any regulatory response, it is necessary to focus on the correct issues rather than making a knee-jerk reaction that “something must be done!” Crises (whether major or minor) often automatically call forth regulatory responses. However, this is often not the optimal response as not all problems can be solved by regulation or without imposing substantial costs. It is not likely that, in the case of Northern Rock, there is any need for more detailed prescriptive regulation. For a survey of the regulatory issues see Goodhart (2008).

The problem in the case of Northern Rock was largely one of supervision and institutional structure and arrangements. Nevertheless, we have indicated that there are areas where a fundamental rethink of regulation and supervision is warranted in order to address structural fault lines in current institutional arrangements.

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Section II

Other Aspects of the Crisis

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The U.S. Foreclosure Crisis: A Two-Pronged Assault on the Economy

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Abstract

The foreclosure problem affects real economic activity and financial markets. The timing of developments in the housing market will limit how fast markets restore stability and growth. The Federal Reserve has complicated the problem by creating new lending programs that redirected its credit supply to private financial institutions and in the process violated the first rule of central banking to lend liberally in a liquidity crisis. This failure, compounded by providing a backstop to questionable securities, has slowed market adjustment and risks lengthening and deepening the crisis. This chapter reviews and evaluates the foreclosure crisis, its real impacts in the economy, the financial market effects of the surge in mortgage foreclosures, and the monetary policy response to the problem.

Introduction

The U.S. mortgage foreclosure crisis has been called “the worst financial crisis since the great depression.”¹ There are two distinct channels of influence of this crisis. The first is the rise in foreclosure that affects homeowners and economic activity most directly. The second is financial, flowing from the effects on lenders and on financial markets. These are the direct channels of influence of the crisis. There are ancillary effects

on balance sheets and prices that affect economic behavior and thereby influence markets, which are also discussed here.

The timing of developments in these two channels determines how fast consumers and business work through these problems and restore stability and growth to the nation's housing and financial markets. But both are rooted in housing markets, and these markets are likely to be very slow to adjust and to eliminate difficulties. It takes time for good mortgages to go bad and for bad mortgages to move from delinquency in payments to the initiation of the foreclosure process. It also takes time from initiation of the process until the process ends with the sale of a property and the distribution of the losses to affected parties. Thus, no matter how quickly financial markets adjust, the effects of the foreclosure problem will persist at least until mid-2009.

This chapter reviews the emergence of the foreclosure crisis and its real impacts in the economy in Section I. Section II takes up the financial market effects of the surge in mortgage foreclosures, including the loss of capital by financial institutions, potential effects on credit supply and on the economy. In Section III the monetary policy response to the problem is discussed and evaluated.

The chapter concludes with an assessment of the outlook for the crisis. This chapter is an interim report in the sense that it analyses events through June 2008, nearly the first year of the foreclosure crisis.

I. The Foreclosure Problem

The foreclosure problem became visible in late 2006. The foreclosure rate had been fairly steady at about 1% from the second quarter of 2005 to the same period of 2006, but then it rose slightly to 1.05% in the third quarter of 2006 and to 1.19% in the fourth quarter of 2006. By the end of 2007 it had climbed to 2% and reached 2.47% in the first quarter of 2008. In this chapter, the foreclosure rate is the share of mortgages that are in the foreclosure process (inventory).²

Subprime loans, which are loans to borrowers with relatively low credit scores and records of limited or poor credit experience, have become an increasing share of mortgages in this decade and currently make up about 12% of such loans. In 2000 and earlier, subprime loans were negligible. Other higher risk mortgages today include credit extended by the Federal Housing Administration (FHA) and so-called alt-A loans, which are loans to borrowers usually with prime credit scores, but who do not provide any documentation ("no-doc") of income or wealth or ability to service pay the loan, or very little documentation ("low-doc"). They have been reported to constitute over 10% of all mortgages. When all three categories are added together, nearly 30% of loans outstanding are estimated to be in the high-risk category.

Table 6.1 U.S. foreclosures in the first quarter 2008

	<i>Foreclosure rate</i>	<i>Loans serviced</i>	<i>Loans in foreclosure</i>	<i>Percent of loans serviced</i>	<i>Percent of foreclosed loans</i>
Prime	1.22	35,311,975	430,806	78.1	38.6
Subprime	10.74	5,542,954	595,313	12.3	53.3
FHA	2.4	3,256,579	78,158	7.2	7.0
All loans	2.47	45,224,567	1,117,047	100	100

Source: Mortgage Bankers Association.

Subprime loans have foreclosure rates that are much higher than that for prime loans (Table 6.1). They make up about 53% of the loans in foreclosure. At the end of the first quarter of 2008, 10.7% of subprime loans were in foreclosure, and this rate is expected to rise to 12%, about the share already registered in some high-foreclosure Midwestern states. The foreclosure problem would not be so noticeable if the share of such risky loans had not exploded since 2003. At the last peak in foreclosures in 2001, only 2.7% of loans were subprime, according to Mortgage Bankers Association data. In early 2008, it was 12.3%, down from a peak of 14% in the second quarter of 2007. The subprime problem is largely an adjustable rate problem. As shorter-term interest rates, to which adjustable rate loans are typically tied, rose in 2004–2006, prime borrowers and even better-advised FHA borrowers shifted to fixed mortgage rate loans. About 80% of prime borrowers and about 90% of FHA borrowers have fixed rate loans. In contrast, 58% of subprime borrowers have adjustable-rate loans. These loans represent the highest foreclosure risk. While it is common to refer to the current foreclosure problem as the “subprime” or “adjustable-rate subprime” crisis, it is important to bear in mind that the foreclosure rate for prime loans, especially alt-A loans, is also rising and represent an important component of the problem.

A. The Causes of the Crisis

A key forerunner of the mortgage crisis was the decline in the demand for housing. The pace of house price appreciation had accelerated from about 7.5%–8% in 2003 to 9.5% in 2004 and 2005, while housing starts boomed up from about 1.9 to 2.0 to 2.1 million units per year over the same period. Subsequently housing starts and the pace of house price appreciation began a steady and continuing pace of decline from January 2006 to the present (July 2008); the pace of house price appreciation turned negative in late-2007 according to the Office of Federal Housing Enterprise Oversight (OFHEO) data. Some would argue that the slowing in price appreciation was a key cause in the foreclosure crisis as many investors, especially

subprime borrowers, had reportedly entered contracts that were only viable if house prices continued their rapid appreciation and borrowers could refinance based on their higher expected equity. Another group, similarly affected, was speculators who bought in order to flip the purchases at higher prices. Once price appreciation became questionable or disappeared, they walked away from their mortgages. A third group were buyers who found that they had negative equity after prices began falling in some markets *and* who had cheaper rental or purchase housing alternatives elsewhere.

Mian and Sufi (2008) argue that an increase in supply of mortgages by nontraditional suppliers in 2001–05 resulted in a large fraction of the home price appreciation and the subsequent rise in defaults. The appreciation presumably played a large role in attracting borrowers expecting further gains. Timing is everything, however, as Gerardi, Shapiro, and Willen (2008) argue that it was the bust in house prices that caused the rise in defaults. Perhaps they are all correct and the rise in nontraditional sources of mortgage credit explained the dynamics of house prices, both up and then down, and as the latter occurred, foreclosures spiked up. Demyanyk and Hemert (2008) take a different view; their results show that credit quality deteriorated for both adjustable-rate and fixed-rate subprime loans steadily from 2001 to 2006 after adjusting for price changes, and for borrower and loan characteristics.

Another factor that influenced the surge in housing starts and prices in 2004–05, and that may have contributed to the subsequent defaults, was the decline in the real interest rate. Some have argued that this was caused by the Federal Reserve's (Fed) low federal funds rate target of 1% from late-June 2003 to late-June 2004. But the housing market and prices actually boomed most in the rest of 2004 and 2005, despite a rising federal funds rate target. By the peak of the housing market in late 2005 and early 2006, the federal funds target rate was rising from about 4% to 4.25% and at the end of January 2006 it was set at 4.5%. More importantly, throughout the period of the rising and then constant federal funds rate, from July 2005 to August 2007, there was little change in long-term interest rates or fixed rate mortgage interest rates. Just as a higher federal funds rate did not affect the mortgage rate, neither did the low rates. The monthly average real long-term 30-year mortgage rate was falling throughout the period so that mortgage rates were higher during the 2004–05 boom and lower subsequently.³ From July 2004, when the federal funds rate began to rise, to its last month at its peak in July 2007, the real mortgage rate averaged 3.37% a full point below the 4.40% average during the previous 37 months of very low federal funds rates from June 2001 to June 2004.⁴

Adjustable rate loans had rates that moved in line with short-term rates such as the federal funds rate. For adjustable-rate loans, and borrowers

and lenders who did not correctly assess the prospects of affordability and default when these rates reset, it is likely that the federal funds rate level strengthened demand of housing early on and weakened it later. It is difficult to blame the Fed for the poor financial judgment or ignorance on the part of borrowers and lenders, and it is even more difficult to determine how the Fed could have carried out their successful stimulus and restraint without such unintended effects on adjustable rate borrowers.

Another factor that contributed to the spike in foreclosures is that many mortgage lenders benefited from the underpricing of mortgage credit by avoiding a large piece of the cost of capital. Large banks created structured finance positions in Structured Investment Vehicles (SIVs) at their holding companies and did not face the capital charges that they would have faced by keeping these positions on their banking books. These SIVs created a market for mortgage-backed securities and lowered the interest rates that originators faced in creating new risky mortgages. These structured finance positions were especially attracted to high risk-high return securities and this demand benefited the riskiest borrowers most.

B. The Real Effects are Large and Will Continue Until Mid-2009

The origins of the problem date back to 2004–06 when a large share of new mortgage loans were made to subprime borrowers. Many of these loans began to default much earlier than the normal experience from the past (see Demyanyk and Hemert [2008], for example). In fact, some of them went into default without ever making a payment. As the marginal adjustable-rate loans adjust for the next year or so, the foreclosure rate is expected to spike further.⁵

Most estimates of the impact of foreclosure on the housing market show that it has reduced real GDP (gross domestic product) growth by about one percentage point since 2006. Continuing drops in housing starts suggest that this effect will be no larger than this through mid-2009. Housing starts peaked in late-2005 and January 2006, when starts hit 2.3 million per year. Since then, starts have plummeted nearly in half, to about one million since fall 2007. While there is some slowing in the pace of decline, there is little evidence that the end of the decline is imminent.

Real residential fixed investment has been declining since early 2006 and the pace of decline has been relatively large. The impact on GDP however has remained small and is likely to be even smaller in the future because the share of housing expenditures in real GDP is so small, currently about 4%. The rapid pace of decline of real residential investment reduces the overall growth rate by about one percentage point. This is roughly the average

effect that has been estimated by the Bureau of Economic Analysis for the nine quarters since the beginning of 2006 (0.91%). In the absence of any acceleration in the pace of decline in housing starts, it is unlikely that the direct effect on GDP growth would increase in the future. Such a direct effect on the growth rate of GDP ignores the ability of the resources that would have produced residential investment to move fairly quickly into other economic activity, for example, commercial construction, so that the direct effect overstates the potential effect on demand for real goods and services and real GDP.

Some analysts focus on the indirect effect of the influence of the foreclosure crisis on consumer spending instead of residential construction. The value of residential housing assets in the United States is about \$20 trillion (fourth quarter 2007), about 28% of total household assets. Some fear that the foreclosure crisis will lead to a sharp reduction in household wealth and lead consumers to attempt to boost saving and cut spending in order to rebuild wealth. For example, see Mishkin (2007). Others question whether there is likely to be such a sharp reduction and, should it occur, that it will be sufficiently powerful to affect consumer spending appreciably (e.g., see Juster, Lupton, Smith, and Stafford 2006).

An offsetting indirect effect of the foreclosure crisis, some argue, is the effect that it has had on policymakers' actions to lower the federal funds rate and thereby lower the value of the dollar and boost overall demand. There is no question that the dollar has been generally falling since the end of 2000, including since the federal funds rate was reduced after August 2007, but the correlation for the Fed's broad trade-weighted exchange rate and the effective federal funds rate for weekly data from the week ending 27 December 2000 through 2 July 2008 is -0.40 , the opposite of the hypothesized sign. The federal funds rate did rise from 23 June 2004 and then remained relatively high until August 2007, yet the dollar fell over this period too. The dollar actually fell much more slowly in the early period, end-2000 to end-June 2004 (a -1.6% annual rate), while the federal funds rate was reduced from 6.5% to 1%. From the week ending 8 August 2007 through the week ending 2 July 2008, the dollar fell at a 7.6% rate, almost seven times as fast, while the federal funds rate only fell about half as much, from 5.25% to 2.08%.

II. The Financial Effects of the Foreclosure Problem

The other direct effect of the foreclosure problem is financial. Every mortgage that ends in foreclosure means that someone loses their house. The biggest financial losses usually accrue to the mortgage lenders. In early 2007, lenders, particularly "monoline" lenders who only do mortgage lending,

began to fail in large numbers, either because they held relatively large asset positions in subprime loans that were moving into delinquency or losing value because of expectations that they would, or because of the decline in the lending business. Over 70 mortgage companies went into bankruptcy or out of business in the first quarter of 2007. American Century was the first of the major monoline mortgage lenders to exit the industry. Other large mortgage lenders that have failed or are in bankruptcy include American Home Mortgage and First American Mortgage. Many large financial providers exited the subprime business, including H&R Block, Nomura Securities, Lehman Brothers, and Countrywide Mortgage. The near failure of Countrywide led to their merger agreement with Bank of America.

Beginning in the spring and summer of 2007, hedge funds, large and small, went out of business because of losses on collateralized debt packages that they held and that were based on payments on subprime loans. Best known are the near half-billion dollar losses at UBS' hedge fund Dillon Read, due to about \$150 million in direct losses and related liquidation costs, and the \$2 billion in losses at two Bear Stearns funds that threatened the viability of the firm. Sowood Capital lost \$1.5 billion, half its fund, before being sold to Citadel Investment Group. Dozens of hedge funds closed in the same months because of large subprime related losses and a lack of liquidity.

The U.S. subprime crisis spread to other countries. UK-based Calibur Capital lost 82% of its \$900 million hedge fund because of subprime related losses and closed. Basis Capital in Australia announced that one of its funds, part of a \$1 billion group, could lose half its value due to subprime and structured credit tied to subprime loans, while others including Absolute Capital in Australia and BNP Paris announced suspensions of redemptions and withdrawals because of subprime losses.

The worst phase of the process, at least from the perspective of financial market losses, came during the week of 9 August 2007 when two state-owned German banks were bailed out. It was these potential failures that led credit markets to seize up and to the massive intervention, over \$130 billion, by the European Central Bank (ECB). The Fed responded in kind, though not in scale, by injecting funds into the credit market, lowering the discount rate, and forming a consortium of major banks to borrow at the discount window to show that it is all right to borrow from the Fed to further its attempt to prop up the most hard hit markets for short-term financial and commercial credit. The latter effort was largely unsuccessful and later led to more aggressive steps to introduce new policies that would boost bank borrowing. The loan volume in the asset-backed commercial paper (ABCP) market declined about 6% or \$90 billion in the week ending 23 August 2007. Eventually the decline was about \$400 billion as ABCP fell from about \$1.2 billion to about \$800 billion. The ABCP market shrank

because of the realization that most of the pools of assets that backed this commercial paper contained varying shares of subprime mortgages of varying risk of default and foreclosure.

Firms dependent on the commercial paper market, especially bank holding companies, have reduced the supply of these assets; interest rates on these instruments actually fell throughout August and September. The shrinkage in the commercial paper market resulted in other credit products being dumped on markets besides subprime loans. More and more funds surfaced that had financed long-term and illiquid structured asset holdings with short-term ABCP. Many of these firms have prime brokerage arrangements, which provide servicing of financial transactions, and credit, with major investment banks so that the spillover effects fall on major banks, jeopardizing bank capital. Most analysts expected the subprime problem to be contained among specialized mortgage lenders and hedge funds, and, more importantly, for there to be little effect on banks or other systemic effects on the banking system.

The spread of the subprime loan problem to institutions that had heavy exposure to such loans quickly was augmented by institutions that financed themselves by issuing ABCP. Even if they remained solvent after their losses on the subprime related-assets, their ability to refinance their short-term debt positions became impossible. The only recourse was to obtain alternative financing or begin to liquidate assets whose value had certainly fallen but was unclear and too risky in a cautious market. Not surprisingly, analysts began to talk about credit markets that were seizing up, or even a credit crunch. These developments mushroomed when it became clear that banks, the one group of institutions that investors thought relatively more immune, began to exhibit similar problems.

In part, the expectation that major financial firms and banks would be insulated from the effects of the foreclosure problem was based on the well-capitalized position of the U.S. banks. Cracks in this story widened following bailouts and the failure of Sachsen LB in Germany. The crisis spread to Northern Rock, the fifth largest mortgage lender in the United Kingdom. Northern Rock had also come to rely on nondeposit commercial paper financing, and when that dried up, there was a run on the small amount of deposits it had relative to its assets. Eventually, the Bank of England bailed out Northern Rock with loans of over \$100 billion. The most significant initial failure in the United States was that of NetBank, a \$2.5 billion Internet bank based in Georgia that had taken on a portfolio of subprime mortgages and whose lending activity had resulted in losses of \$200 million in 2006 alone. This bank, which failed in late September 2007, was the largest U.S. bank to fail in 2007 and the second of three failures in 2007.

Credit markets were said to have seized up in three key episodes in August–September 2007, in December 2007–January 2008, and in

March 2008, with after effects of the latest events continuing into June. The market for subprime mortgages has been largely moribund, as has the market for securitized debt based on asset pools containing them. While ABCP volume outstanding fell sharply from August 2007 to May 2008, it was replaced by a large increase in the volume of commercial bank and institutional money market lending. To finance the SIVs and other assets that had been financed by ABCP, banks increased issuance of certificates of deposit, and institutional money funds have expanded, as higher rates than earlier attracted the funds that formerly were invested in ABCP. Yet SIVs (shades of Enron), and other issuers of asset-backed securities, were said to face frozen markets. The Treasury's early efforts to create a consortium to hold these assets at unchanged or little changed prices failed, so banks began to take these assets back on their books and financed them internally. The Federal Home Loan Mortgage Corporation (Freddie Mac) and the Federal National Mortgage Corporation (Fannie Mae), along with banks, launched efforts to avoid taking losses on loan guarantees, the next stage of the crisis.

In March 2008, the near failure of Bear Stearns and the launch of several new Fed policies, discussed below, intensified market concerns over the viability of bond insurers, especially, those who had begun to invest in the securities that they insured. This had contagion effects to mortgage-backed securities (MBS) and other securities with low credit ratings and to credit default swaps (CDS). Other novel and risky assets also came into question, especially the auction rate security market. Since the latter market was an important source of financing of student loans, and their economic viability had been brought into question by congressional legislation earlier in the year, this market also froze up and few traders could be found for what would normally have been routine auctions. The consequences of these changes has had lasting effects on the extent of emergency borrowing from the Fed, while creating uncertainty on the extent of new safety nets for financial firms, government sponsored enterprises (GSEs), and any other firms that might be at risk in financial markets. Congressional discussion of extending Fed lending to mortgage borrowers at risk for foreclosure or for student loans quickly surfaced after the Bear Stearns loan and merger arrangements in March 2008 (discussed below). These reactions showed the slippery slope of using central bank powers to pursue public ends for private outcomes that go well beyond the mandate of the Fed. They also reinforced the growing perception of the politicization of the Fed.

There is only limited experience with nontraditional loans and subprime loans, so an estimate of the ultimate severity of the problem has considerable uncertainty. Subprime and other high-risk loans account for about 30% of mortgages. At worst, in early 2002, foreclosures on subprime loans hit about 9%. A somewhat higher peak of about 12% with the now-larger

share of high-risk loans could mean that their foreclosures could account for 3.5 percentage points of the overall foreclosure rate. With the remainder running slightly above normal, say around 1%, the overall foreclosure rate would reach about 4%, the highest since the Mortgage Bankers Association began collecting data. It is not implausible that the foreclosure rate on subprime loans could be far worse, say double the 2002 level, or 18%. In that case, the overall foreclosure rate would reach about 7%. Such levels would mean about 2 million to 3.2 million home loans in foreclosure at the peak, two to three times the number at the end of 2007, and this would have serious consequences for the housing industry, housing prices, and the economy.

An overall foreclosure rate of 4% to 7% for 2008 would represent, at most, about \$400 billion to \$700 billion. Virtually all losses on these mortgages accrue to lenders, and they in turn typically lose up to half the value of the mortgage. So the losses to lenders could mount to \$200 billion to \$350 billion. Of course, there is a small fraction of additional loss to the homeowners who lose their equity, if any, in the homes. To the extent that high levels of foreclosed property in real estate markets reduce housing prices, the losses to other homeowners will also be significant.

The losses to U.S. banks and other depository institutions will absorb about half the mortgage losses because the rest of these mortgages have been securitized and sold off to other investors, including banks abroad. This means losses to U.S. banks would be about \$100 billion. The Organization for Economic Cooperation and Development (OECD 2008) estimates much smaller losses to U.S. commercial banks, about \$60 billion, but the overall cost is estimated to be about \$350 billion to \$450 billion. The OECD has pointed out that banks hold about \$9 in deposits per dollar of capital so that a \$60 billion loss of capital would lead to a decline in bank credit by \$548 billion, a decline of about 5.4% in total bank assets. The OECD indicates that it could take six months to two years to replace the lost capital with earnings and that this would imply a completely unacceptable credit crunch and recession. The International Monetary Fund (IMF 2008) produced a much larger estimate of losses. In their view, the total loss due to the foreclosure crisis is likely to be \$945 billion. However, this figure includes much more than the estimates above. It factors in other related security losses, as well as price-induced increases in mortgage delinquencies.

Greenlaw, Hatzius, Kashyap, and Shin (GHKS 2008) estimate that the total losses will be \$400 billion, with about half being borne by U.S. financial institutions. These are about the same as the estimates here. They take this loss as a basis for further effects on credit supply and GDP arising through a financial accelerator linking bank capital to the supply of nonfinancial sector credit.⁶ The \$200 billion loss in capital to banks, savings and loans, credit unions, brokers and hedge funds, and government-sponsored

enterprises is expected to result in a decline in nonfinancial domestic credit available by about \$910 billion. They estimate that a 1% drop in the supply of nonfinancial debt would lead to a 0.34% drop in GDP growth in the short run and a 0.44% loss in GDP in the long run. For the \$910 billion, or 3%, drop in credit available, this yields a 1.3% drop in real GDP growth over a year, about \$420 billion per year in a \$14 trillion economy.⁷ They view this effect as additive to any decline coming from the fall in residential investment and from any wealth effects on consumer spending. The GHKS estimates are much larger than those of the IMF or OECD; they start with a larger \$200 billion loss for financial institutions (the same as the estimate in this article) than the OECD's \$60 billion, but smaller than the IMF's total loss of about \$565 billion, or \$282.5 billion for financial institutions on a comparable basis. The reason for larger effects is that they make some critical assumptions that inflate the impacts.

GHKS assume that financial institutions will raise only half as much new equity as they lose from the subprime crisis and, more importantly, that the decline in capital will be multiplied by a nearly unchanged ratio of desired assets to equity of 10, roughly the ratio for banks and for all the financial firms listed above. The OECD and IMF also include a "deleveraging effect" as banks reduce overall credit supplies in line with the reduction in bank capital.⁸ However, a substantially higher percentage of new capital has been raised to offset provisions of banks due to losses on subprime loans. The FDIC reports that U.S.-insured financial institutions reported asset write-downs of \$105.6 billion from the beginning of 2007 through the first quarter of 2008. Recent estimates of the largest asset write-downs since January 2007 total about \$190 billion (Lex 2008). In addition, Fannie and Freddie have reported write-downs of \$8.9 billion over the same period. These figures are far above the IMF estimate. Moreover, banks have been very aggressive in raising new capital, offsetting the lion's share of write-downs already. Bank capital overall is relatively high and healthy and expected to stay that way in 2008. Moreover, bank profits are generally sufficient to absorb some capital reduction while offsetting much of the reduction out of other profits within a short period. A recent estimate by Sarkozy and Quarles (2008) puts new capital raised already at \$330 billion on \$350 billion of losses, or about 94% replacement. This is not to mention offsets through newly profitable asset allocation changes that are likely to finance all of potential decline in bank loans arising from the financial accelerator.

III. The Federal Reserve in Crisis

Since August 2007, the Fed has approached near panic in their adoption of multiple traditional policy measures and, since December 2007, in

adopting major new policy tools.⁹ These actions have been motivated by the emerging mortgage foreclosure crisis that began in late 2006 and by its associated credit crisis.¹⁰ There have been many serious or even “appalling” errors, in the response of the Fed to the credit market and nonbank problems created by the foreclosure crisis.¹¹

A. Normal Policy Actions

The Fed conducts monetary policy by setting a federal funds rate target and a primary credit rate (formerly called the discount rate). One of the most important steps taken by the Fed in this century was reversed at the outset of the foreclosure crisis: discount policy had been the subject of a long debate on the appropriate use of discount lending as a tool of monetary policy. Anna Schwartz (1992) recounts many of these issues, including problems it created for the conduct of monetary policy, the abuses of a “subsidy” discount rate where the rate at which the Fed lent funds to banks was below the federal funds rate, the fact that the Fed often loaned funds for liquidity purposes to insolvent banks, and finally the pressures on the Fed to lend to nonbanks. She advocated that the Fed abolish the discount window. For most purposes, liquidity can be provided to markets equally well through open market operations, so the discount window is completely unnecessary for the conduct of monetary policy.¹² In 2003, the Fed finally addressed many of these problems, but with one major exception: it did not abolish the discount window. Instead, it created a penalty discount rate with a fixed spread over the federal funds rate for primary lending and an even higher spread for banks that have a poor supervisory rating for capital, assets, management, earnings, liquidity and sensitivity to risk, called the CAMELS rating.¹³ These steps fixed many of the problems noted by Schwartz, and they put the setting of the discount rate, which became the primary credit rate, on autopilot, moving in lock step with the federal funds rate target setting of the Fed.

The Fed led off its response to the foreclosure crisis by abandoning this key aspect of the 2003 policy change. They altered the spread between the primary credit rate and the federal funds rate. Spreads were allowed to change subsequently, restoring the notion that the discount rate setting was an independent component of policy. Also by focusing more on targeted lending to illiquid banks, the Fed recreated the potential for lending to failing banks and created internal pressures to lend to nonbanks. Only now, much of that lending was via other new routes.

Table 6.2 shows the multiple and sometimes large changes in the federal funds target rate and discount rate since August 2007. There are two changes in the federal funds rate that equaled 75 basis points. One, in

Table 6.2 “Normal” policy actions since January 2007

<i>Federal funds rate (%)</i>	<i>Change (basis points)</i>	<i>Primary credit rate (%)</i>	<i>Change (basis points)</i>	<i>Effective date</i>	<i>Spread (primary credit—federal funds)</i>	<i>Scheduled meeting</i>
5.25	25	6.25	25	6/29/06	100	Yes
NA	NA	5.75	−50	8/17/07	50	No
4.75	−50	5.25	−50	9/8/07	50	Yes
4.50	−25	5.00	−25	10/31/07	50	Yes
4.25	−25	4.75	−25	12/11/07	50	Yes
3.50	−75	4.00	−75	1/22/08	50	No
3.00	−50	3.50	−50	1/30/08	50	Yes
2.25	−75	2.50	−100	3/18/08	25	Yes
2.00	−25	2.25	−25	4/30/08	25	Yes

Source: Federal Reserve Bank of St. Louis (FRED).

January 2008 at an unscheduled meeting, was followed up eight days later with another 50 basis point cut. Either the situation was deteriorating faster than at any time in history, or the changes reflected some degree of hesitancy or indecision on the part of the Fed.

Another set of actions that constitute normal policy responses to international financial market disruptions are swaps loans of U.S. dollars for foreign currencies. Pressures in credit markets abroad led the Fed, the ECB, and the Swiss National Bank to agree to bilateral swap arrangements of \$20 billion and \$4 billion, respectively, on 7 December 2007 and to extend and increase them to \$30 billion and \$6 billion on 11 March 2008. These actions were generally perceived to have reduced the liquidity shortfall of dollars in Europe and London and to bring down the London Interbank Borrowing Rate (LIBOR), which had spiked up relative to the fed funds rate.

B. New Policy Actions

Since August 2007, the Fed has exhibited a profound concern for directing credit to financial institutions. This approach stands in marked contrast to the traditional approach of supplying liquidity in a liquidity crisis and letting the market place direct credit to firms that truly face a liquidity problem and not insolvency. In August and September 2007 and again in December 2007, there were large surges in borrowing from the Fed through discount lending to banks. Financial market conditions apparently deteriorated again in March 2008. As a result, the Fed created a new credit program in December 2007 and took several new steps in March 2008.

Aglietta and Scialom (2008) describe the Fed’s new actions as an illustration of the “permanence” of the central bank’s lender-of-last-resort function in

the United States, Euro-area and the United Kingdom, in sharp contrast to the analysis of the historical shortcomings and revisions of that function detailed above. In their view, the financial world has changed since the Long Term Capital Management (LTCM) hedge fund crisis of 1998 so that the potential for hedge fund or other risky financial institutions to create financial market instability requires that the central banks take on supervisory oversight over these firms and put them under the umbrella of the lender-of-last-resort function.

The emphasis on control of hedge funds derives from the notion that Bear Stearns failure was due to the failure of two of their hedge funds earlier. This is ironic because large numbers of hedge funds failed in the United States in the first half of 2007, and Amaranth failed in September 2007, all without systemic effects on other financial institutions. The Amaranth failure, a loss of \$6.5 billion, was nearly twice the size of the private recapitalizations for LTCM or Bear Stearns hedge funds. Moreover, the authors ignore the failure of Enron in 2001, one of the largest derivative traders in the world at their peak, which did not cause a ripple in financial markets as underlying asset values in the energy sector and related financial derivatives collapsed. Bear Stearns failure was more similar to the failure of Drexel Burnham Lambert in 1990, which also had little or no systemic effects on other financial institutions, though Fed officials argued that it was different because of the large number of over-the-counter (OTC) derivatives to which Bear Stearns was a counterparty. No evidence was provided that these exposures exceeded similar counterparty exposure in the Enron or Drexel Burnham failures, relative to the firms' assets, the share of the market or the size of the financial system at the time.

The most striking feature of some of these new credits to banks, primary dealers, and investment banks is that some of them allow financial institutions to borrow against so-called toxic waste, largely illiquid mortgage related assets. The imminent failure of any institution because of its exposure to these assets will likely lead to a sharing of the losses by the Fed and taxpayers. In the best case, however, these new facilities allow banks to warehouse these assets, on which they are reluctant to take losses, and gain liquidity by using the assets as collateral for government security borrowings from the Fed. This scheme allows financial institutions to forego necessary price adjustments on assets, extending the financial crisis and making it likely to be worse than it would have been without this assistance.

The first new credit facility implemented by the Fed is the Term Auction Facility (TAF), announced on 12 December 2007. This facility allows banks to acquire funds in regular auctions for 28 days with the same collateral as would be required for borrowing at the discount window. The amount of funds auctioned is announced ahead of time, and the market determines the auction rate at which transactions occur. Initially, auction amounts were \$20 billion but have been raised to \$50 billion. The purpose of the TAF is

to overcome the aversion of banks to borrow from the Fed through the discount window. The rates at which banks have borrowed are near the target federal funds rate, allowing for expectations of declines over the next 28 days, an alternative-borrowing rate for banks borrowing from another bank.

The second new facility, announced on 7 March and expanded on 11 March 2008, is the Term Security Lending Facility (TSLF), which began on 27 March 2008. This program arose in light of the liquidity and solvency problems at Bear Stearns, which teetered on insolvency on Friday, 14 March 2008, and the potential for contagion or illiquidity at other investment banks. Most large investment banks are also authorized as primary security dealers by the Federal Reserve Bank of New York and are authorized to trade U.S. securities with the Fed. At the outset of the financial crisis there were 20 primary dealers, but Bear disappeared on 29 May 2008 and Countrywide Securities will disappear after its merger with Bank of America.

The TSLF will provide up to \$200 billion in U.S. Treasury securities through a weekly auction of Treasury securities loans to primary dealers for a term of 28 days. The collateral asset is essentially a sort of swap, though not technically called one, with the Fed. It can include government agency debt, including residential MBS, or AAA/Aaa private-label MBS (which some have referred to as the toxic waste of the financial system because they are relatively illiquid due to uncertainties of what each security contains), and commercial MBS. The increased availability of Treasury securities at financial institutions is expected to improve liquidity in the repo market in particular, and to enhance liquidity at financial institutions.¹⁴

A third program that grew out of the sale of Bear Stearns is the extension of credit to cover the potential loss on the least liquid and highest loss potential securities on the books of Bear Stearns. Initially these loans were to Bear Stearns and averaged about \$5.5 billion for the week ending 19 March 2008 or \$7.74 billion for the five days from 14 March through 18 March 2008. By 19 March 2008 these loans had been repaid. The commitment by the Fed to lend to Bear Stearns was later formalized in the creation of a SIV, though the Fed does not refer to it as such. This is the arrangement that banks had used that led to the outbreak of the credit crunch and collapse of the ABCP market that had financed bank SIVs in August 2007. See Williams (2008) for more details. Under the Fed's new SIV, the Fed loaned \$29 billion and JPMorgan Chase lent \$1 billion, with the SIV using the proceeds to acquire \$30 billion of the most illiquid and dubious securities from Bear Stearns portfolio. These securities were valued on a "mark-to-market" basis as of March 14, 2008. The SIV is managed by Black Rock Financial Management. The interest rate on the Fed's loan will be the primary credit rate and the interest rate on JPMorgan Chase's loan will be the primary credit rate plus 475 basis points. Repayment is to begin no later than the second anniversary date of the loan. The Fed is the

effective owner of the SIV because any profit or loss will accrue to the Fed after the first \$1 billion loss, which will accrue to JPMorgan Chase. The term of the loans is ten years, but this term is renewable at the discretion of the Fed. The SIV first appeared on the Fed's balance sheet on 26 June in data for the week ending 2 July 2008 under the prophetic name Maiden Lane LLC.

The fourth new facility created by the Fed is the Primary Dealer Credit Facility (PDCF), announced on 16 March with initial transactions on 17 March 2008. This facility allows for Fed lending to primary dealers for up to 6 months at the primary credit rate with the normal collateral required for discount lending to banks. The creation of the PDCF and the TSLF were reportedly based on the Bear Stearns experience and the Fed's inability to lend to investment banks.¹⁵

C. The Fed has Largely Neutralized their Efforts

New credit extensions have been relatively large, but have not carried through to the bottom line, the Fed's total assets. The new loans have been "sterilized" by sales of other Fed assets, specifically their holding of U.S. government securities. This was the great error of the Fed in the Great Depression: it did not expand its assets to produce more money and credit in the economy to stimulate spending. It made this mistake because it acted like a private commercial bank and not a central bank. Ironically, the Fed is doing this again.

Table 6.3 shows key assets of the Fed at the beginning of the crisis and nine months later on 30 April 2008. The data come from the Fed's

Table 6.3 The Fed has offset most of the new credit by selling securities (in millions of dollars)

<i>Selected assets (average for week ending on date indicated)</i>	<i>30 April 2008 (\$)</i>	<i>1 August 2007 (\$)</i>	<i>Change (\$)</i>
Securities held outright	548,692	790,758	-242,066
Repurchase agreements	115,500	25,786	89,714
Term auction credit (TAF)	100,000	NA	100,000
Primary credit	11,964	2	11,962
Primary dealer Credit facility (PDCF)	17,775	NA	17,775
Other credit extensions	0	NA	0
Securities lent to dealers			
-term (TSLF)	143,409	NA	143,409
-overnight facility	23,176	9,917	13,259
Total private credit	245,239	25,788	219,451
-incl. security loans	411,824	35,705	376,119
Total assets (end of period)	889,040	874,112	14,928

Source: Board of Governors of the Federal Reserve System.

weekly H.4.1 release for 2 August 2007, the week before the credit crisis component of the mortgage foreclosure crisis, and 1 May 2008. Securities held outright declined dramatically after August 2007. Securities normally account for over 90% of Fed assets, but declined 30.6% over the next eight months. This is a dramatic and unprecedented shrinkage, all the more so at a time when the Fed was expected to be, and claimed to be, increasing liquidity and credit in the financial system. Overall total assets rose only \$14.9 billion over the period, or about 1.7%. Over the previous year, total assets grew 2.4% and this was down from a 4% increase from 3 August 2005 to 2 August 2006. Thus the Fed did little or nothing to raise the total supply of credit, liquidity, or money in the economy. Such offsetting of asset acquisitions by sales of other assets is usually restricted to foreign exchange transactions and is referred to as “sterilization”; in effect, the Fed sterilized its credit extensions to financial institutions by liquidating its holding of Treasury securities. The negligible growth of Fed assets reflects a slowing that has been going on for at least three years.

The Fed has switched their credit from the U.S. government to banks and primary dealers, a slight majority of which are affiliated with banks or bank holding companies. Expansion of traditional lending to depository institutions has been small, except during a few periods noted above, but new facilities such as the TAF and PDCF have swelled to \$117.8 billion, or more than 13% of Fed assets. An even larger increase in new credit to the private sector, specifically Treasury security loans to dealers of \$156.7 billion, substantially boosted credit to private firms. These loans are outstanding at the discretion of the dealers and so are not available for use for monetary policy purposes even if they remain good loans.

Another asset shown in Table 6.3 is repurchase agreements (RPs). These are short-term acquisitions of Treasury securities from primary dealers under agreements to be sold back to the primary dealers at a fixed price. Normally these are overnight transactions, but sometimes there are term RPs that can run a few days or even a few weeks. RPs increased by \$89.7 billion over the first nine months of the foreclosure crisis. An RP is normally a way the Fed provides funds to support bank reserves temporarily. They ease the cost pressures on primary dealers by holding down their inventory cost of holding securities. RPs are another way the Fed is trying to channel credit to depository institutions and investment banks and away from the U.S. government and also to accommodate banks' demand for high quality securities by, in effect, borrowing those securities overnight rather than buying them outright. In effect, the banks gain flexibility in their own Treasury security holdings, which is critical to their liquidity and funding requirements. RPs have more than tripled, rising to almost 10% of the Fed's assets.

The third program above, the loan to an investment bank, has been zero except for the one-week period in which a loan was outstanding. This line on the Fed's balance sheet is "other credit extensions." The \$29 billion loan to fund the acquisition of former Bear Stearns securities shows up in the Fed's proprietary interest in their new on-balance-sheet SIV called Maiden Lane LLC beginning 26 June 2008. Presumably JPMorgan Chase owned the securities in the interim and sold them to Maiden Lane on that date. The other new facility, the TSLE, began on 27 March 2008 when \$75 billion was auctioned in the first weekly auction. Since there is an exchange of collateral securities under this program, there is no effect on total Fed assets, only the composition of their possession.

When the security loans are taken into account, private sector Fed credit has risen from 4% of Fed assets in early August to 46.3% nine months later. The \$29 billion payment to create the SIV holding private sector assets from Bear Stearns, assuming the practice continues of sterilizing these assets, will bring the total private sector credit share to 49.6% of Fed assets. Such a dramatic increase in exposure to the private sector and the extent of this exposure is unprecedented, and it has substantially impaired the size of assets that could be sold to fight inflation, cutting those assets in half. The hasty and risky decision to do so, and the potential defaults or losses on any of these positions, put the Fed's reputation for prudential central banking and integrity directly at major risk, and the contagion to the Fed's credibility as an honest and responsible central bank is likely to be high in the event of any loss on private sector credit. Even without losses, however, these innovative efforts have been completely unsuccessful in increasing the supply of credit to the U.S. economy. Private sector credit increases have been fully sterilized by the Fed, making little or no new credit available.

Since Fed assets are volatile from week to week and the table is based on daily observations, it is useful to check the monthly average data on the Fed's direct measure of influence on money and credit. According to the board of governors' monetary base measure, adjusted for reserve requirement changes, the base grew at only a 0.6% annual rate from July 2007 to April 2008, down from 2.1% in the previous year and 4.0% in the year earlier (July 2005 to July 2006). This perspective indicates that policy actions are continuing a slowing that began much earlier and that, since the financial crisis began, there has been no acceleration in Fed supply of credit, money, and liquidity to the financial system. The comparable measure from the Federal Reserve Bank of St. Louis shows essentially the same pattern of slowing to a stagnant pace, with a recent annual growth rate of 0.5%, and earlier rates of 2.0% and 3.5% rates, respectively. Monetary aggregate measures have not accelerated much since August 2007, except for a brief spurt in

January–February 2008. The slowing in monetary base growth over the past three years and in broader monetary aggregate measures M1, and to a lesser extent M2, are consistent with the subsequent slowing in GDP growth.

IV. Prospects and Outlook

There are numerous issues posed by the Fed's policy actions since last August, especially the necessity and appropriateness of the new credit facilities. The other concern going forward is how much longer the problem will grow and how severe the financial crisis will become. Alan Greenspan (2008) recently answered this question.

The current financial crisis in the US is likely to be judged as the most wrenching since the end of the Second World War. It will end eventually when home prices stabilize and with them the value of equity in homes supporting troubled mortgage securities.

Of course, this is not a date certain. It is more likely to be fully determined by the end of the mortgage foreclosure crisis. Most forecasts of that date are late in 2008 or in 2009 because mortgage resets, contractual increases in payments whether interest rate remain the same or even fall somewhat, on most adjustable rate subprime loans are not expected to ease until then.

The second prong of the foreclosure crisis, the financial industry effects, remains a threat to the overall economy's performance. Many analysts fear that a generalized collapse in confidence in lending could lead to a recession. Various industry leaders initially put the risk of recession at nearly a fifty-fifty bet. Subsequently, most analysts and an even higher percentage of the public came to believe that the economy was, or soon would be, in a recession. Moreover, the recognition that the foreclosure peak would come later in 2008 or in 2009 led many to conclude that the recession would last at least through the end of 2008.

The estimates here indicate an expected peak in the foreclosure rate of 4%, with a worst-case estimate of 7%. This implies a financial cost of \$400 billion to \$700 billion, with about half of the estimate accruing to lenders, who in turn will lose up to half of the value of the mortgage. So the losses to lenders could mount to \$200 billion to \$350 billion, evenly split between U.S. depository institutions and others. U.S. insured institutions have taken loss provisions of \$105.6 billion in 2007 and the first quarter of 2008, but a similar amount has been registered over the same period by UBS and six large losers in Europe. Thus it is possible that banks, in the aggregate, have provided already the lion's share of losses and that over the next 12 to 18 months loss provisions are not likely to rise much or banks

could even recapture some excess provisions. But banks do not hold most of these mortgages, either in the United States or abroad. Moreover, the worst-case loss on foreclosed mortgage loans is not a large number relative to the size of annual growth in wealth, debt, and lending, nor is the consequent loss of capital a severe constraint on lending and credit, as some analysts have suggested. Besides, capital-constrained lenders can readily reduce investments to boost loans, as price signals in competitive markets will instruct them to do.

Financial markets have exhibited considerable resiliency, but further adverse developments could lead to further turmoil. Unexpected shocks could disrupt the market recovery, especially because the foreclosure spike looms out in the future and its full extent and timing remains subject to uncertainty. Moreover, the effects of the foreclosure crisis come on the heels of, and perhaps in part due to, a sharp slowing in the growth of money and credit that began in 2006 and that had begun to slow output growth before the foreclosure crisis. Moreover these effects are being reinforced by an energy price shock that has been especially large over the past year.

Fed actions in March 2008 provided a substitute to the Treasury Secretary's aborted plan for a super-SIV by putting a floor under the prices of illiquid mortgage-related securities and their depressed prices. The Fed approach is to allow these securities to be warehoused as collateral for liquid, high-quality government securities. To the extent that the securities are not needed, they can be loaned back to the Fed overnight as RPs. Thus the liquidity problem is temporarily abated and the pressure on financial firms to sell these assets and take losses when prices are allowed to fall is avoided. The problem with such a solution is that it ignores the pressures of the market place and the resolution of balance sheet problems in the financial system. By postponing necessary and inevitable market price adjustments, the plans make the adjustment problem longer and greater. Moreover, by creating a role for the Fed in the postponement of these adjustments, the Fed becomes a contributor to lengthening and worsening the financial crisis and risks its reputation as a central bank and national treasure.

No effort has been made here to assess blame in terms of causes of the subprime crisis, although various hypotheses are discussed and a Fed role in the boom and bust in the market is ruled out. The biggest changes in markets that could have contributed to the problem were (1) the development of new financial instruments and the spread of securitization which were technological changes that are not likely to disappear, (2) the role of off-balance-sheet SIVs in fostering the growth of mortgage originations because of the lack of capital requirements on bank holding company SIV assets, and (3) the role of GSEs in facilitating the expansion of mortgage

lending through artificially low costs of capital associated with their implicit government guarantees. There were also abuses within the lending channels that were overlooked by mortgage originators specializing in originating and distributing mortgages through securitization. Regulatory reform can correct most of the problems created by poor regulation, but this has proven to be very difficult in the past. A major concern will be that markets that are better able to price and distribute risk will continue to create new credit opportunities available to marginal borrowers.

Notes

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1. See Reinhart (2008a).
2. Some analysts prefer to use the new foreclosure starts rate instead, but it is the total inventory in foreclosure that represents the foreclosure problem, especially with regard to its impact on housing starts and prices of homes. The foreclosure rate could rise simply by slowing down the process of moving mortgages from filing to settlement, but this process is fairly stable and averages slightly over one year. Crews Cutts and Merrill (2008) discuss the various processes used by states to move homes through foreclosure. They find that the U.S average is a little over a year from first filing to completion of the foreclosure process.
3. The real mortgage rate here is the 30-year conventional rate less the expected inflation, which is proxied by inflation over the past 12 months measured with the chain personal consumption expenditure deflator.
4. The 10-year Treasury Inflation Protected Securities (TIPS) rate was also lower than it had been during the period of declining and low federal funds rates and did not rise until after the peak in the housing market.
5. Sherlund (2008) estimates that the peak in foreclosures will come in spring or summer 2008, and that the foreclosure starts rate will not decline much until 2009.
6. The financial accelerator and its effects are explained by Bernanke, Gertler, and Gilchrist (1999).
7. This estimate is based on a link between GDP and nonfinancial domestic debt. There is a growing literature that bank credit affects GDP; see especially Kashyap and Stein (1995) and (2000). The literature on the credit channel stresses the unique role of banks, however, not nonfinancial domestic debt. Whether monetary policy slowed GDP, or bank capital losses have caused such a slowing, or both, a slowing in GDP growth began in mid-2006 and has continued into 2008. A replication of the GHKS analysis of real GDP growth from 1983 to the present found that neither lagged growth of loans and leases ($t = -0.54$) nor commercial and industrial loan growth ($t = -0.11$) were significant, nor were their counterpart measures for growth over the previous four quarters, where t -statistics are 0.61 and 0.06, respectively.

8. Annual asset growth for insured commercial banks from 1968 to 2006 is uncorrelated with the previous year-end ratio of capital to total assets for asset measures, including gross loans (0.02) and commercial loans (20.04); the correlation with total asset growth is positively significant (0.80). While the growth rate of bank size (assets) is correlated with the starting equity ratio, loan growth, including commercial loan growth, is not.
9. See Chapman (2008) and Reinhart (2008b) for some similar arguments, especially on the expansion of private sector credit exposure arising from the Bear Stearns debacle and merger.
10. The policy switches and indecision exhibited by the Fed could have been influenced by the shortage and mix of governors of the Fed over the period. Due to political differences between the Administration and Congress, there were two vacancies among the seven governors that could not be filled due to Congressional opposition. A third opening became available at the end of January 2008, when one governor's term expired. He continued to serve pending his confirmation to a new term or the confirmation of his replacement, and a fourth open position becomes available at the end of August 2008.
11. The "appalling" description has been attributed by Torres (2008) to William Poole, who retired as president of the Federal Reserve Bank of St. Louis at the end of March 2008, after most of the steps discussed in this section had been taken. The comment was in reference specifically to the loans and subsequent arrangements to facilitate the merger of Bear Stearns. In the same article, Anna Schwartz is quoted as saying the loans were a "rogue operation."
12. Schwartz (1992) cites Kaufman (1991) as support for this view of the lack of a proper role for the discount window and discount lending, as well as many others who have made this argument. This is a central proposition of central banking that has been stood on its head by the recent conduct of monetary policy, which has resurrected the notion that lending directly to illiquid, now insolvent, institutions works more quickly and with greater precision than open market operations.
13. See Wheelock (2003) for an explanation of these changes.
14. There is already an overnight security lending facility (since December 2006), but this new facility adds more certainty to availability of the securities and terms.
15. Most large investment banks are primary dealers to whom the Fed can lend through repurchase arrangements, including term RPs, and most have bank charters that allow them to borrow as banks at the discount window. For example, Bear Stearns Companies owned Bear Stearns Bank and Trust of Princeton New Jersey, a billion dollar bank. Its acquisition by JPMorgan Chase and Co. was approved on 1 April 2008.

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Revising European Union Directives: Deposit Insurance and Reorganization and Winding Up

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Abstract

The global financial crisis requires the European Union (EU) to promptly revise its Directives on deposit insurance, reorganization and winding up of credit institutions. Disparate country practices have hampered the formulation of a coordinated response to the crisis and have demonstrated the infeasibility of effectively supervising, reorganizing, and winding up credit institutions, particularly cross-border institutions, and guaranteeing their deposits. While recognizing the difficulty in harmonizing across Europe's contrasting legal traditions, the chapter calls for cross-border banks to have a European banking charter that is accompanied by special, harmonized systems of supervision, failure resolution, and deposit guarantees. These harmonized systems might well be developed around a revised Washington/Basel consensus on these issues and provide a template for the later creation of federal oversight in Europe.

I. Introduction

The world's financial system fell into panic in October 2008. Excesses in subprime lending in the United States had started the rot and had drawn attention to its long-standing macroeconomic imbalances and

deficiencies in the incentive, oversight, and resolution structures in U.S. financial markets, and particularly in structured finance. These deficiencies were not supposed to exist: U.S. regulatory and resolution practices had been reformed to embody the “never again” lessons from the 20-year-old S&L debacle (see Table 7.1).¹

Just as the Washington consensus on development strategy was receding (Easterly 2002, 2008), the Scandinavian, East Asian, and Latin

Table 7.1 Remedial practices in the United States, the Basel Consensus and its adoption in the EU

<i>U.S. practices</i>	<i>Basel Consensus^a</i>	<i>Practices in EU countries</i>
Supervisory structure		
The prudential supervisor should be independent, but accountable.	Yes	Supervisors are not always independent or accountable.
There are many supervisors.	No	The central bank is often the supervisor.
Legal protection is available for supervisory staff.	Yes	Protection is sometimes inadequate.
The regulated usually pay for their oversight.	Yes	Often the central bank pays.
Supervisory resources must be adequate.	Yes	Resources are sometimes inadequate.
Accounting rules should not be changed to obscure financial problems.	Not explicit	IAS (International Financial Reporting Standards) have been adopted.
Supervisor should have one realistically targeted objective.	No	Multiple, overambitious objectives conflict.
Supervision in normal times		
Good information is essential.	Yes	What data should be collected and published?
On-site inspections are important and should be held at least annually.	Yes	Sometimes inspections are infrequent, and sometimes external auditors conduct them.
Prompt mandatory corrective actions aim to remedy weakness.	Yes	Discretion is slow and is preferred to rules.
Regular enforcement		
The grounds/triggers for action should be clearly understood.	Toward	The grounds for action differ among EU countries.
Banks should know the full panoply of supervisory actions.	Yes	Enforcement actions differ and may be unclear.
Supervisors should use a full range of graduated actions.	Toward	Serious measures differ substantially.
Banks should know what actions supervisors can take and their triggers.	Toward	Supervisory actions and triggers may not be publicly known.

Table 7.1 (Continued)

<i>U.S. practices</i>	<i>Basel Consensus^a</i>	<i>Practices in EU countries</i>
When insolvency threatens		
The supervisor needs the ability to put weak banks into conservatorship under administrative law, where owners retain an interest.	Hotly debated	Provisional administration is not always available and is typically judicially administered.
Lending of last resort limited to illiquid but solvent banks.	Yes	The policy and its practice are unclear.
Failures placed into receivership ASAP before insolvency.	Debated	EU law prevents this.
Supervisors have both mandatory and discretionary grounds for receivership.	Toward	The grounds for insolvency are often limited.
Receivership		
Need special laws and administrative (not judicial) processes.	Being debated	Often under general insolvency law and judicial administration.
Resolve failed banks promptly at least cost by penalizing owners and large creditors, but not small depositors.	Being debated	Europe has a tradition of bailouts, despite EU rules against state aid.
Has a hard-to-get exception to least-cost resolution for systemic crises.	Yes	Minimizing costs is typically not thought to be important.
The receiver needs a range of solutions to resolve failures.	Yes	Liquidation is often the only alternative to bailout.
The payment system should be kept operational.	Yes	Several EU countries suspend payments.
Deposit insurance should be paid promptly. The uninsured should receive a prompt advance based on estimated recoveries. ^b	A weak yes	Insured depositors wait 3+ months: the uninsured await the proceeds of liquidation.
Deposit insurer needs good financial, technical and human resources. ^b	Yes	Some systems lack resources.
Banks need a right to appeal inappropriate supervisory decisions and to obtain compensation for wrongful actions, but not their reversal.	Appeal, not reverse	Embodied in EU primary law. Many allow supervisors' actions, including license revocation, to be reversed.

Sources: Author's analysis, FSF Web sites.

Notes: ^a As observed by the author while working with the IMF and the World Bank.

^b Garcia (2000) and Financial Stability Forum, 2001, have made further recommendations for effective systems of deposit insurance.

American financial crises of the 1990s and early 2000s led the international community to a second consensus on handling financial crises. That consensus is embodied in the World Bank and International Monetary Fund's (IMF) set of standards and codes that form the backbone of their financial

stability assessment program (FSAP) (Kato, 2005). The IMF now defers to the Financial Stability Forum (FSF) and the Basel Committee for Banking Supervision (BCBS) when it assesses countries' implementation of the Committee's "Core Principles for Effective Banking Supervision" (1997) as part of the 12-step FSAP. Consequently, the new consensus might better be called the Basel Consensus (Basel Committee 1997, 2002; FSF 2008).

Many of the Basel components have been only meagerly adopted in the EU, as is summarized in the table. The European concept of *subsidiarity* avoids conformity in regulatory actions; instead it requires each EU member to accept the practices (above a minimum bar set out in its directives) of other member countries, even if they differ markedly from its own. As a result, there is a wide divergence in supervisory, failure resolution, and deposit insurance practices in the EU. These diverse systems make it more likely that weaknesses will be overlooked and failed institutions will be bailed out, as appears to be happening as the 2007–2009 crisis unfolds. The disparity has also contributed to the difficulties of the EU and the G7 in offering effective responses to the crisis (U.S. Treasury 2008). While the major EU countries finally announced a plan of concerted action on 12 October 2008, it falls to each national government to implement it (Council 2008, Summit 2008).

Concerned about its ability to handle a systemic crisis, particularly one involving large, complex, cross-border institutions, the EU has for some time been considering revising its reorganization and winding up related directives on banking, capital adequacy, prudential supervision, mergers, and deposit insurance (European Parliament 2001, 1994; European Commission 2007). The international financial crisis has made these revisions urgent. But revisions raise the question whether it is possible to have successful supervisory and failure resolution practices for the increasingly important cross-border banks, without imposing greater conformity than exists at present. As a step toward answering this question, this chapter catalogs many of the existing disparities.² Using information gathered from multiple sources and presented in tables 7.2 through 7.12 in sections II through VI, it examines supervisory structures and objectives in the 27 EU countries and the responses available to the authorities as a bank deteriorates from soundness and capital adequacy to bankruptcy, winding up, and depositor protection.³ Information is generally available on countries' practices for supervision and deposit insurance in normal times. One of this chapter's discoveries, however, is how little is publicly known about many countries' actions to resolve seriously troubled banks, as is evidenced by the large number entries in the "no information" columns in the later tables. It calls for the authorities to obtain and publish the missing data. It is difficult to have coordinated actions when EU authorities do not know, or have not publicly revealed, the powers that member countries possess.

The concluding section agrees with Lastra (2008) and Garcia, Lastra, and Nieto (2009) that such diversity hampers the effective supervision and resolution of cross-border banks in the EU and beyond and that greater harmonization would be desirable. While acknowledging that full harmonization will be difficult to achieve, especially after the Dutch and French electorates voted down a new EU Treaty in 2005 and Irish voters rejected a weaker Lisbon Treaty in June 2008, the chapter recommends a requirement that banks that cross national borders obtain a European charter that would impose supervision by an EU authority and reorganization and winding up according to EU practices that have been harmonized to conform at least to a revised Basel Consensus.

II. Supervisory Structures

Three tables in this section examine, first, the political/organizational structure, independence, financial strength, transparency, and accountability of the supervisory body; second, its objectives in each of the 27 countries; and third, rights to appeal supervisory decisions.

Table 7.2 shows that in 2007 one-third of the EU countries had a separate supervisor for banks (“credit institutions”), while the central bank was the supervisor or shared prudential oversight with a second body in other EU countries. In recent years comprehensive supervision has increased at the expense of segmentation, so that by 2007 it predominated in the ratio of 15:12 among EU Members. The supervisor was fully independent of political influence in 11 EU countries, but less so in the others. The supervisor was

Table 7.2 Supervisory structure

<i>Supervision by a separate authority</i>	<i>By the central bank</i>	<i>By central bank & supervisor</i>	<i>By supervisor & government</i>
Austria, Belgium, Denmark, Estonia, Latvia, Malta, Sweden, UK (8)	Bulgaria, Cyprus, Czech Rep., Greece, Ireland ^a , Italy, Lithuania, Netherlands, Poland, Portugal, Spain, Romania, Slovakia, Slovenia (14)	Finland, France, Germany, Hungary (4)	Luxembourg (1)
<i>Supervision is segmented by financial sector</i>		<i>Supervision is comprehensive</i>	
Bulgaria, Cyprus, France ^b , Greece, Italy, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovenia, Spain (12)		Austria, Belgium, Czech Rep., Denmark, Estonia, Finland ^c , Germany ^d , Hungary, Ireland, Latvia, Malta, UK, Netherlands, Slovakia, Sweden (15)	

(Continued)

Table 7.2 (Continued)

<i>Supervisor is operationally independent</i>	<i>Supervisor consults the government</i>	<i>Supervisor shares responsibility</i>	<i>Supervisor is partly independent</i>	<i>Supervisor is not independent</i>
Austria, Belgium, Bulgaria, Italy, Greece, Estonia, Latvia, Lithuania, Portugal, Romania, Slovenia (11)	Cyprus, Czech Rep., Ireland, Luxembourg, Slovakia (5)	Denmark, Finland, France, Netherlands, Spain (5)	Malta, Poland, UK (3)	Germany, Hungary, Sweden (3)
<i>The supervisor is accountable to the legislature</i>	<i>To legislature & MOF</i>		<i>To other</i>	<i>Is not accountable</i>
Bulgaria, Cyprus, Czech Rep., Estonia, Greece, Latvia, Lithuania, Portugal, Romania, Slovenia, Sweden (11)	Austria, Belgium, Denmark, Finland, Germany, Hungary, Ireland, Italy, Luxembourg, UK, Netherlands (11)		France, Malta, Slovakia (3)	Poland, Spain (2)
<i>Supervisory staff has legal protection</i>		<i>Staff does not have legal protection</i>		
Other EU member countries (21)		Czech Rep., Estonia, Greece, Italy, Lithuania, Sweden (6)		
<i>Supervision is funded by the industry</i>	<i>Funded by the central bank</i>	<i>Funded by the industry and the government</i>	<i>Funded by the government</i>	<i>Funding is inadequate or constrained</i>
Belgium, Denmark ^c , Estonia, Finland, Germany, Hungary ^e , Luxembourg, Malta, UK (9)	Bulgaria ^f , Cyprus, Czech Rep., France, Greece, Italy, Spain, Lithuania, Poland, Portugal, Romania, Slovakia, Slovenia (13)	Austria, Ireland, Latvia ^g , Netherlands, Sweden (5)	Denmark (1)	Belgium, Cyprus, Czech Rep., Denmark, Germany, Malta, Poland, Sweden, Slovakia (9)

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); IMF (2001 to 2007); Freshfields Bruckhaus Deringer (2007); Hüpkes (2000, 2003); and House of Commons (2008).

Notes: ^a The supervisor in Ireland is an autonomous agency within the central bank.

^b The supervisor in France oversees banks and investment firms; there is a separate supervisor for the securities industry.

^c The supervisor in Finland does not oversee the insurance industry.

^d Germany has one supervisor for federal CIs and separate supervisors for regional institutions.

^e Funding is under the government's control; it is part of the country's budget.

^f The supervisor's budget in the central bank of Bulgaria is approved by Parliament.

^g Funds for supervision in Latvia come from the industry, the central bank, and the government, but ultimately all will come from the industry.

accountable to the legislature in most countries, but also to the Ministry of Finance in half of them. Surprisingly, the supervisor was not held accountable in two EU countries. Oversight was funded by the industry in one-third of EU countries, by the industry and/or the government in five countries, and by the central bank in the remaining states. Funding for supervision has regrettably found to be inadequate in one-third of EU Members.

Supervisory Objectives

It is not surprising that a primary objective for prudential supervisors is to ensure compliance with relevant laws, rules, and regulations, but Table 7.3 shows that the objectives of supervisors in the EU are typically more varied and are often ambitious. For example, all EU countries, except France and Luxembourg (there is no information for the latter) want their supervisors to promote financial stability, the orderly and safe functioning of the financial

Table 7.3 Supervisory objectives

<i>Objective</i>	<i>Countries</i>	<i>Numbers^a</i>
Ensure compliance with relevant laws and regulations	Austria, Belgium, Czech Rep., Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Malta, Netherlands, Poland, Portugal, Slovenia, Spain,	17
Promote financial stability	Austria, Belgium, Bulgaria, Czech Rep., Estonia, Finland, Greece, Hungary, Italy, Latvia, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, UK	19
Achieve the orderly and safe functioning of the banking system	Bulgaria, Cyprus, Germany, Hungary, Latvia, Lithuania, Malta, Netherlands, Portugal, Romania, Slovakia, Spain, UK	13
Promote confidence in the banking/financial system	Austria, Denmark, Finland, Ireland, Slovenia, UK	6
Encourage efficiency in and/or development of the banking system	Czech Rep., Estonia, Finland, Greece, Italy, Latvia, Lithuania, Sweden, UK	9
Promote banks' ability to compete	Italy, UK	2
Protect consumers and/or creditors and depositors	Austria, Belgium, Bulgaria, Denmark, Estonia, Germany, Hungary, Ireland, Latvia, Netherlands, Poland, Portugal, Slovakia, Sweden, UK	15
No information	Luxembourg	1

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); IMF (2001 to 2007); Freshfields Bruckhaus Deringer (2007); Hüpkens (2000, 2003); and House of Commons (2008).

Note: ^a Numbers do not sum to 27 because many supervisors have multiple objectives.

markets, and/or confidence in them. Even though each EU country has deposit insurance, 15 supervisory authorities are expected to protect the country's creditors, depositors, and/or consumers. Citizens may expect the government to bailout the banking system if supervision does not ensure financial stability, the orderly functioning of the banking system, confidence in it, or protect its depositors, and this has happened during the financial crisis.

In all but two EU countries supervisors are charged with pursuing multiple goals among those listed in the table. The Financial Services Authority (FSA) in the UK is particularly burdened with six objectives (four statutory) and seven other supervisors each have four goals. Only France and Cyprus have a clear solitary mandate—in France's case to ensure compliance and in Cyprus' to ensure orderly and safe functioning of the banking system. In the UK and Italy the supervisor is charged with promoting their country's banks' ability to compete—an objective that may well be at variance with EU-wide interests.

The Right to Appeal

Citizens of the EU are well endowed with rights to appeal (Table 7.4). Many countries grant their banks a right to a supervisory hearing, and in

Table 7.4 The right to appeal

<i>Right to</i>	<i>Yes</i>	<i>No</i>	<i>Don't know</i>
Supervisory hearing	Austria, Czech Rep., Finland, France, Germany, Ireland, Luxembourg, Portugal, Slovakia, Spain, UK (11)	Hungary (1)	The others (15)
Ministerial or independent review	Belgium, Cyprus, France, Ireland, Italy, Luxembourg, Spain, UK (8)	Hungary (1)	The others (18)
Appeal to a court ^a	All Austria ^b , Germany ^b , Greece ^b , Italy ^b , Luxembourg ^b , Netherlands ^a , Portugal ^b , Spain ^b , Sweden ^b (27)	None (0)	None (0)
Court compensation, not reversal	Belgium, Bulgaria, France, Germany, Luxembourg (5)	Austria, UK Spain (3)	The others (19)
For third party to contest in court	Austria, Belgium, France, Germany ^c , Italy, Lithuania, Luxembourg ^c , Netherlands, Romania, UK (10)	None (0)	The others (17)

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); IMF (2001 to 2007); Hüpkes (2000, 2003, 2008); and House of Commons (2008).

Notes: ^a The right of appeal to a court is established in EU law (Human Rights).

^b The court is a special administrative court, but that court must have jurisdiction to examine all questions of fact and law (Hüpkes 2008).

^c There was a right of appeal for third parties in Germany and Luxembourg, but it is not clear that it still exists after legislative changes.

some instances, the supervisor’s action is held in abeyance until the appeal has been heard and the action has been found to be justified. In all, eight EU countries allow their banks to have a ministerial or an independent hearing on the regulator’s actions.

The European law on human rights allows every citizen a right to appeal a supervisor’s decision to a court, although this court may be an administrative rather than a judicial court. In three countries the courts have been known to reverse the supervisor’s decision. In four countries, however, the court awards compensation instead of reversing the supervisor’s action. In fact, the European Court of Justice (ECJ) has acknowledged the need for finality and permits compensation to be paid *ex post facto* instead of reversing a supervisory decision (Hüpkes 2008). Third parties are known to be able to contest supervisory actions in ten countries. Such a plethora of rights of appeal, especially where the regulator’s decisions can be reversed, may impede supervisory discipline over errant institutions.

III. The Supervision of Healthy Banks

Table 7.5 examines the regulation/supervision of healthy banks in terms of information adequacy, frequency of onsite inspections, supervisory approach, transparency, and the regrettable lack of any commitment to mandatory prompt corrective action (PCA).

Table 7.5 Supervision in normal times

<i>Information believed to be adequate</i>		<i>Information said to be inadequate</i>	
The others (25)		Czech Rep., UK (2)	
<i>Supervisor takes a gradual approach^a</i>	<i>Requires a high burden of proof</i>	<i>Needs to consults the government</i>	<i>Relies on moral suasion</i>
Austria, Belgium, France, Germany (4)	Austria, Czech Rep. (2)	Cyprus, Czech Rep., Finland, Hungary, Italy, Malta, Spain, Sweden (8)	Belgium, Finland, Hungary, Ireland, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain (12)
<i>Required to delay taking action</i>			
Lithuania, Hungary (2)			
<i>Annual report is published</i>	<i>Is not published</i>	<i>No information</i>	
The others (23)	Austria, Germany (2)	Italy, Netherlands (2)	

(Continued)

Table 7.5 (Continued)

<i>Has annual onsite inspections</i>	<i>Every 2 years</i>	<i>3 or more years</i>	<i>No information</i>
Belgium, Cyprus, Finland, France, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Romania, Slovenia, Sweden (13)	Austria, Bulgaria, Czech Rep., Estonia, Germany, Greece, Hungary, Poland, Portugal, Slovakia, UK (11)	Denmark, Italy (2)	Spain (1) <i>Relies on Auditors^c</i> Germany, Luxembourg (2)
<i>PCA has not been implemented^d</i>	<i>PCA is possible^d</i>	<i>PCA is precluded by law^d</i>	<i>Supervisor uses qualitative judgment^e</i>
Austria, Belgium, Cyprus, France, Germany, Greece, Italy ^e , Luxembourg, Malta, Netherlands, Portugal, Sweden, UK ^b (13)	Bulgaria, Czech Rep., Denmark, Estonia, Hungary ^f , Ireland, Latvia, Poland, Romania, Slovakia, Slovenia, Spain (12)	Finland, Lithuania (2) <i>Don't know</i> (0)	Denmark, Estonia, Greece, Ireland, Italy, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia (11)

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); IMF (2001 to 2007); Hüpkes (2000, 2003); and House of Commons (2008).

Notes: ^a Column numbers may not add to 27.

^b The UK considered, but did not implement, a system of prompt corrective action after the Northern Rock debacle.

^c Exclude these countries when summing to 27.

^d Numbers in the columns 1 though 3 sum to 27.

^e The supervisor in Italy is required to act promptly when a bank becomes insolvent, but is slow to recognize losses.

^f Hungary has PCA type actions and triggers, but, nevertheless, is sometimes required to delay action.

While most EU countries consider that their supervisors have access to adequate information, it has been acknowledged to be inadequate in two member states, including the UK (House of Commons 2008).⁴ No EU country had adopted mandatory PCA according to Nieto and Wall (2007),⁵ although the UK considered, but did not implement it, after the Northern Rock debacle (Bank of England, FSA, and HM Treasury, 2008). The table shows that it is possible to adopt PCA in 12 EU countries, but it is precluded by law in two member states. Instead, supervisors typically use qualitative judgment, rely on moral suasion, take a gradual approach to correction, consult with the government on corrective measures, require a high burden of proof, or are enjoined to delay taking corrective action. All but two supervisors publish annual reports.

The Basel Consensus agrees that information from timely on-site inspections is essential to effective supervision. Yet, Table 7.5 reports that on-site inspections are conducted annually in less than half the member countries, are held biennially in 11 member states, including the UK, and are performed at intervals of three or more years in two member countries. Two EU members rely heavily on the external auditors for their on-site information.

IV. Correction When the Bank Deteriorates

This section examines the grounds for enforcement actions in the different EU countries and the remedial measures that supervisors are permitted to take.

Less Invasive Remedial Measures

Asser (2001) argues that the laws in some countries (e.g., Austria, Belgium, France, Ireland, Portugal, and the UK) give bank supervisors broad grounds for action and typically accompany these broad grounds with a narrowly specified range of prudential remedial actions that their supervisors can impose. In contrast, other countries, such as the Netherlands, specify narrow grounds but grant a broad range of measures to accompany them.

Asser notes that corrective measures in the EU typically proceed in two stages. When first becoming aware of deficiencies, some supervisors recommend that the weak institution remedy its deficiencies, while others require the bank to come into compliance with regulatory standards. If the errant institution does not respond to its satisfaction, the supervisor moves to a second set of steps as illustrated in the upper rows of Table 7.6. For example, most, but not all, supervisors can issue cease-and-desist orders or injunctions and impose fines or sanctions, although fines are considered to be inconsequential in some cases. The majority of supervisors may remove, suspend, or replace managers, but one-third lacks this power. Half, but by no means all, of the countries allow their supervisors to demand that an institution raise additional capital. Few have the power to prevent asset transfers or acquisitions. Many, but not all, supervisors can take steps to thwart capital withdrawal and/or require a deficient institution to form a remedial plan.

If the bank deteriorates further, supervisors may take more drastic action. They may require a troubled institution to seek approval for its actions, impose conditions or limitations on its license, restrict its power to take deposits or make loans, write down its capital, restructure it,

Table 7.6 Corrective measures / enforcement actions

<i>Corrective actions</i>	<i>Supervisor has the noninvasive power</i>	<i>Supervisor lacks the power</i>	<i>Don't know</i>
Recommend corrections	Austria, Belgium, France ^b , Germany, Luxembourg, Netherlands (6)		21
Require compliance	Czech Rep., Denmark, Estonia, Finland, France, Germany, Italy, Malta, Poland, Portugal, Slovenia (11)		16
Issue cease and desist orders or injunctions	Austria ^c , Belgium ^c , Bulgaria, France, Czech Rep. ^c , Denmark, Finland ^c , Italy ^c , Germany ^c , Hungary ^c , Ireland ^c , Latvia ^c , Lithuania, Luxembourg, Malta ^c , Poland Netherlands ^c , Portugal ^c , Romania, Slovakia ^c , Slovenia, Spain ^c , Sweden ^c , UK (24)	Cyprus, Greece (2)	1
Impose fines, penalties, and/or sanctions	The others ^d (21) <i>Inconsequential Fines</i> Czech Rep., Estonia, Malta (3)	Cyprus, Italy ^e , Lithuania (3)	0
Remove, suspend, or replace managers	Belgium, Bulgaria, Cyprus, Estonia, Finland, France, Germany, Ireland, Latvia, Lithuania, Luxembourg, Malta, Portugal, Romania, Slovenia, UK (18)	Austria, Czech Rep., Spain ^b , Denmark ^a , Greece, Hungary Italy, Netherlands ^a , Poland ^a , Slovakia, Sweden (9)	0
Demand additional capital	Austria, Bulgaria, Denmark, Estonia, France, Germany, Hungary, Italy, Lithuania, Poland, Portugal, Romania, Slovenia, Spain (14)	Finland, Greece, Luxembourg, Slovakia, Sweden, UK (6)	7
Prevent asset transfers	Austria, Belgium, Czech Rep., France, Spain Hungary, Ireland, Malta, Portugal (9)	Finland, Italy, Sweden (3)	15
Prevent capital withdrawal	Austria, Belgium, Bulgaria, Cyprus ^f , Estonia, France, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain (20)	Czech Rep., Denmark, Finland, Italy, Sweden, UK (6)	1
Prevent acquisitions	Austria, Belgium, Estonia, Italy, Germany (5)	Finland, Sweden (2)	20

Table 7.6 (Continued)

<i>Corrective actions</i>	<i>Supervisor has the noninvasive power</i>	<i>Supervisor lacks the power</i>	<i>Don't know</i>
Require remedial plan	Belgium, Estonia, Germany, Hungary, Italy, Latvia, Poland, Portugal, Romania, Spain (10)	Czech Rep., Luxembourg, Slovakia ^g , Sweden, UK (5)	12
Require approval	Austria, Estonia, Romania, Spain, UK (5)		22
Restrict license	Ireland, Latvia, Malta, UK (4)		23
Restrict deposit taking	Belgium, Cyprus ^f , Finland, Finland ^f , France, Germany, Ireland ^m , Lithuania, Poland, Portugal, UK (11)		16
Restrict activities	All others (although Cyprus ^f and Finland ^f need approval) (26)	Sweden (1)	0
Reduce capital	France, Czech Rep., Germany, Poland (4)		23
Restructure	Belgium, Cyprus, Denmark ^f , France, Hungary, Italy, Latvia, Lithuania, Portugal (9)	Netherlands ⁱ , Slovakia, Sweden (3)	15
Restrict voting rights	Czech Rep., France, Germany, Hungary, Italy, Latvia, Luxembourg, Netherlands, Portugal, Romania, Slovakia, Spain (9)	Austria (needs court order) (1)	17
Force a merger	France ^l , Hungary, Italy, Latvia, Lithuania, Poland (6)	Denmark ^j , Sweden, Finland, Netherlands ^k , Germany ^k , Ireland ^d (6)	15

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); IMF (2001 to 2007); Hüpkes (2000, 2003); and House of Commons (2008).

Notes: ^aThe supervisor in Denmark, the Netherlands and Poland can remove board members but not managers.

^b The supervisor in Spain can suspend managers for only one year. The Ministry of the Economy needs to order the suspension for longer periods.

^c The action is not made public.

^d The supervisor in the Netherlands levies fines against institutions, not individuals.

^e The Ministry of the Economy levies the fines.

^f The supervisor needs government approval, usually from the Ministry of Finance.

^g Slovakia can request, but not require, a remedial plan.

^h In their gradual approach, supervisors in France can invite shareholders to recapitalize their bank (Hüpkes 2008).

ⁱ The court restructures with the supervisor's approval.

^j Can request the MOF or MOE to do so.

^k The supervisor acts as an honest broker.

^l Needs court approval.

^m Can restrict advertising for deposits.

curtail its owners' voting rights, and/or force it to merge. In a number of instances, the supervisor lacks these powers or needs permission (usually from the Ministry of Finance) to exercise them.

Invasive Actions

Table 7.7 shows the most invasive preinsolvency measures that supervisors can take. Half of the EU supervisors can appoint a special inspector or on-site supervisor, whose task is usually to ascertain the true condition of the institution.

Table 7.7 Invasive corrective / enforcement actions

<i>Corrective action</i>	<i>The supervisor has the power</i>	<i>Does not have the power</i>	<i>Under court control</i>	<i>Not known</i>
Special inspector/supervisor	Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, UK, Ireland, Latvia, Malta, Romania (13)	Finland (1)		The other countries (13)
Appoint conservator/provisional administrator (27)	Belgium, Cyprus, Czech Rep., Denmark ^a , France, Germany, Greece, Ireland, Italy ^a , Lithuania, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain (17)	Finland, Hungary, Latvia, Poland, Sweden (5)	Austria, France, Luxembourg, UK (4)	Bulgaria, Estonia (2)
Moratorium on legal action (27)	Denmark, Germany, Italy ^a , Netherlands, Portugal, Slovenia (6)		Austria, France, Luxembourg, Spain, UK (5)	The other countries (16)
Suspend payments (27)	Belgium, Cyprus ^a , Denmark, France, Germany, Hungary, Ireland, Italy ^a , Latvia, Malta, Slovenia, Spain (12)		Austria, Luxembourg, Netherlands (3)	The other countries (12)
Take control (27)	Luxembourg, Malta, Latvia (3)	Italy ^a , Cyprus ^a (2)		The other countries (22)

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); IMF (2001 to 2007); Hüpkens (2000, 2003); and House of Commons (2008).

Notes: ^a The supervisor may need government approval, usually from the Ministry of Finance.

In Europe, provisional administration takes two forms. The first version is temporary administration under supervisory control that is intended to restore the institution to viability and regulatory compliance. Hüpkes (2003) notes that provisional administration under the supervisor is typically regarded as a preinsolvency measure, as conservation is in the United States.⁶ Many but not all supervisors use provisional administrator to take over the troubled bank's management, although the court appoints that administrator in four countries. The supervisor or its agent assesses the bank's viability and its prospects for reorganization or merger, takes over the management, and keeps the bank operating. The ECJ has determined that owners retain their ownership rights (although they may be reduced), and they must give their consent to the supervisor's demand for an increase in capital.⁷

In contrast, when the judicial authorities take charge in the second version of provisional administration, the bank is typically insolvent. Not only is management replaced, but owners forfeit some or all of their rights. France has tried to accommodate the special importance of bank failures by amending its general insolvency law to allow for both administrative and judicial versions of provisional administration and receivership. As Hüpkes (2003) points out, such an arrangement can lead to conflicts between supervisory and judicial authorities.

The supervisor can take control of the institution in at least three EU countries and can impose a moratorium or stay on legal action in six EU countries. Moratoria are controlled by the courts in five EU countries. The supervisor can cause the troubled bank to suspend payments in 12 EU countries—the court can suspend payments in three countries.

V. At Insolvency

If preinsolvency corrective action is unsuccessful, the authorities in member countries use different methods to resolve failed banks. When rehabilitation, typically under judicial provisional administration, fails, the authorities may merge the troubled bank with a healthy institution, recapitalize it (subject to EU rules on state aid in EC 1999), or wind it up. There is conflicting information about the legal basis for the resolution processes that the members of the EU employ, so the reader should note that the data on insolvency laws in Table 7.8 are based largely on information reported by Barth and others (2004), which provides a relatively recent survey of all member countries and agrees, with earlier data in Hüpkes (2000, 2003) on the laws of the larger western European powers.

Only seven member states have separate laws that govern bank bankruptcy, while the remaining members use their general insolvency laws, although Hüpkes (2003) reports that four member states have special

Table 7.8 Laws and legal/administrative practices governing bank insolvency

<i>Has separate bankruptcy law for banks^a</i>	<i>Country uses the general bankruptcy law for banks</i>	<i>Not known</i>	
Belgium, Bulgaria, Greece, Ireland, Italy, Romania, Spain (7)	Austria ^b , Cyprus, Czech Rep., Denmark, Estonia, Finland, France ^c , Germany ^b , Hungary, Latvia, Lithuania, Luxembourg ^b , Malta, Netherlands, Poland, Portugal ^b , Slovakia, Slovenia, Sweden, UK (20)	(0)	
<i>Provisional administration under the supervisor</i>	<i>Judicial provisional administration</i>		
France ^d , Greece, Italy ^d (3)	Austria ^d , Belgium, Denmark ^d , Finland, France, Germany, Ireland, Luxembourg ^d , Netherlands ^d , Sweden, UK (11)	Other (14)	
<i>Receivership under the banking law</i>	<i>Receivership under a special or the general insolvency law</i>	<i>Receivership under company law</i>	
Bulgaria, France ^c , Italy, Luxembourg, Netherlands, Spain (6)	Austria, Belgium, Cyprus, Czech Rep., Denmark, Finland, France ^c , Germany, Hungary, Ireland, Netherlands, Portugal, Slovenia, Sweden, UK (15)	France ^a (1)	Other (7)
<i>Administrative receivership</i>	<i>Judicial Receivership</i>		
Denmark, France, Italy, Greece, Portugal, Spain (6)	Austria ^e , Belgium ^e , Denmark ^e , France ^e , Germany ^e , Luxembourg ^e , Netherlands ^e , UK (8)	Other (14)	

Sources: Asser (2001), Campbell and Cartwright (2002), Decressin et al. (2007), IMF (2001 to 2007), Hüpkes (2000, 2003).

Notes: ^aBarth et al. (2004) is the source for bank insolvency laws.

^b Hüpkes (2000) says that Austria, Germany, Luxembourg, and Portugal have special provisions for banks in their general bankruptcy laws.

^c France uses banking law with administrative processes or company law when a bank's license is revoked for reasons that are unrelated to its financial condition, and the general insolvency law with judicial processes when the bank is insolvent.

^d Under the banking law.

^e Under both the banking and the insolvency laws.

provisions for banks within their general insolvency laws. The table lists only three EU countries that conduct provisional insolvency administration under the supervisor or the deposit insurer.⁸ The courts take charge of conservation in 11 EU countries, sometimes even when it is governed by the banking law. If restructuring under provisional administration fails, the troubled bank becomes a candidate for receivership, which is governed by the banking law in six EU countries, but by the general insolvency laws in 15 EU countries. Receivership can also be conducted under company

law in France, as well as under the banking and general insolvency laws.⁹ Six EU countries conduct receivership under administrative processes, and in eight countries the proceedings are judicial.

Bankruptcy Laws’ Differing Objectives

The objectives of resolution for banks under a special insolvency law and those covered by the general insolvency laws differ substantially. *Lex specialis* resolutions pay more attention to the public good, as in preserving the stability of the banking system, protecting the economy, and ensuring the continued provision of critical banking functions (Asser 2001; Bliss and Kaufman 2006; Hüpkes 2005, 2008; Lastra 2008). *Lex generalis* is more concerned with resolving insolvency in a predictable and orderly manner, maximizing the return to creditors, channeling resources to more productive uses, and maintaining fairness among the private parties to the action.

Grounds for Insolvency and Receivership

When supervisors admit that a bank is beyond redemption, they may declare it to be insolvent. The grounds for this action differ sharply between *lex specialis* and *lex generalis* (Table 7.9). Even under a special law governing bank insolvency, the grounds in European countries are almost universally permissive and are not mandatory. Unlike in the United States, which has both broad discretionary grounds and mandatory closure at a 2% leverage ratio, in the

Table 7.9 Triggers for insolvency in Europe

	<i>Lex specialis</i>	<i>Lex generalis</i>
Petitioner	The regulator/supervisor	Creditors and debtors (individually or collectively)
Grounds	<p>Regulatory insolvency: the grounds are typically permissive, not mandatory. Supervisors often have broad discretion.</p> <p>Safety and soundness.</p> <p>Failing to meet obligations is not necessarily seen as proof of insolvency.</p> <p>Actual/imminent balance sheet insolvency: the book value of liabilities exceeds that of assets.</p>	<p>The law specifies a narrow set of conditions that determine insolvency.</p> <p>Safety and soundness is not a consideration.</p> <p>Liquidity insolvency occurs when the debtor fails to meet his obligations as they fall due.</p> <p>Balance sheet insolvency is not an issue unless borrower defaults.</p>

Sources: Asser (2001), Bliss and Kaufman (2006), and Hüpkes (2000, 2003).

EU discretion to declare insolvency exists only when the balance sheet already shows (or is very likely to soon show) that the value of liabilities exceeds that of assets. Further, the general insolvency law specifies a narrow set of grounds for insolvency that typically revolve around the debtor being unable to meet his obligations as they fall due, whereas such illiquidity in banks is also regarded as the province of the central bank to act as LOLR to prevent a solvent institution from defaulting. When a bank in the EU is determined to be insolvent, it may have its license revoked and be placed into receivership.

Who is Responsible at Insolvency?

In most EU countries, it is the supervisor (sometimes with court approval) who revokes the license, but the government does so in five EU countries and the court in three (Table 7.10). The supervisor files for bankruptcy in a bare majority of EU countries and is the only body that can do so in three instances;

Table 7.10 Who is responsible at insolvency?

<i>Power to</i>	<i>Supervisor</i>	<i>Government</i>	<i>Court</i>	<i>Don't know</i>
revoke the license	Austria, Bulgaria, Cyprus ^{a,b} , Czech Rep. ^{a,b} , Estonia, France ^a , Germany, Greece, Hungary ^a , Ireland ^a , Latvia, Lithuania, Malta, Netherlands ^{a,b} , Portugal, Romania ^b , Slovakia, Slovenia, UK ^{a,b} (19)	Finland ^c , Italy ^d , Luxembourg, Spain ^d , Sweden (5)	Belgium, Denmark, Poland (3)	0
file for CI bankruptcy	Austria ^e , Belgium, Denmark, France, Germany ^e , Hungary ^d , Ireland ^a , Latvia ^d , Lithuania, Luxembourg ^e , Netherlands, Poland, Romania ^d , Slovenia, UK ^d (15)		France, Italy, Spain ^g (3)	10
declare insolvency & supersede ownership rights	Czech Rep., Denmark, Estonia, Finland, Hungary, Lithuania, Malta, Portugal, Slovakia, Slovenia (10)		Austria, Belgium, Bulgaria, Cyprus, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Romania, Slovenia, Spain, Sweden, UK (20)	1

Table 7.10 (Continued)

<i>Power to</i>	<i>Supervisor</i>	<i>Government</i>	<i>Court</i>	<i>Don't know</i>
intervene and suspend ownership rights	Austria, Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Finland, Italy, Germany, Greece, Hungary, Latvia, Lithuania, Luxembourg, Malta, Poland, Netherlands, Portugal, Romania, Spain, Slovakia, Slovenia, Sweden, UK (24)	Hungary ^f , Lithuania ^f (2)	Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Latvia, Malta, Poland, Romania, Slovakia, Spain, UK (15)	0
close the CI	Austria, Czech Rep ^a , Cyprus, Denmark, Estonia ^h , France, Finland, Hungary, Ireland, Italy, Portugal, Slovakia, Slovenia ^h , Sweden ^h (14)	Hungary (1)	Belgium, Bulgaria, Cyprus ^h , France ^h , Germany ^h , Greece ^h , Ireland, Italy ^h , Malta, Latvia, Luxembourg, Romania, Poland ^h , Netherlands, Slovenia, Spain ^h , UK (17)	0
appoint the receiver/ liquidator	Austria ⁱ , Czech Rep ⁱ , Estonia ⁱ , Finland ⁱ , France ⁱ , Greece, Hungary ^{a i} , Italy, Latvia ⁱ , Malta, Poland ^{a i} , Slovenia ⁱ , Spain (13)	Portugal ^c (1)	Austria, Belgium, Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, Luxembourg, Netherlands, Romania, Slovakia, Spain, Sweden, UK (22)	0
controls the resolution	Austria, Czech Rep., Denmark, Italy, Estonia, Finland, France, Germany, Greece, Hungary, Latvia, Lithuania, Portugal, Slovenia, Spain (15)		Austria, Belgium, Cyprus ^h , Estonia, Finland, Greece ^h , Ireland, Luxembourg, Malta, Netherlands, Poland, Slovenia ^h , Spain ^h , UK (14)	2

Sources: Asser (2001); Bank of England, FSA, Treasury (2008); Barth et al. (2004); Campbell and Cartwright (2002); Decressin et al. (2007); Eisenbeis and Kaufman (2007); IMF (2001 to 2007); Hüpkens (2000, 2003); and House of Commons (2008).

Notes: ^a The supervisor needs government approval, usually from the Ministry of Finance or the Economy, but from the central bank in Hungary.

^b The supervisor needs the approval of the court.

^c The government revokes the license and/or appoints the liquidator on the recommendation of the supervisor.

^d Creditors can also file for the bankruptcy of the bank.

^e Only the supervisory authority can petition for bankruptcy.

^f In Hungary and Lithuania the deposit insurance authority can also intervene.

^g In Spain, the bank's board of directors is obliged to file for bankruptcy when it knows that the institution is insolvent.

^h The supervisor petitions the court.

the court files in three countries. Less than half of EU supervisors can declare the institution to be insolvent and supersede ownership rights—while the court can do so in 20 EU states. The supervisor intervenes and temporarily suspends ownership rights in most EU countries; the court can do so in many, the government in two. The supervisor closes the credit institution in half of the countries; but it is the court that more often does so. The supervisor appoints the receiver/liquidator in 13 EU countries, the government in one, but it is usually the court. A court order is needed for the appointment of a receiver/liquidator in most countries. Control over the resolution process is equally divided between countries' supervisors and courts.

VI. Diversity in Provisions for Deposit Insurance

The next three tables illustrate the diversity that existed among European deposit insurance schemes at the start of October 2008.

Coverage

At the beginning of October 2008, just over half of EU deposit insurance schemes offered coverage at €20,000 per person per bank, the minimum set in the Deposit Guarantee Directive (1994);¹⁰ the remainder, including those in France, Italy, the Netherlands, Sweden, and the UK offered higher compensation. That situation changed rapidly as the global financial crisis escalated. After Ireland guaranteed all deposits held by its six largest banks, Italy, Belgium, Germany, and Greece opted to cover deposits in full, and the UK raised coverage. In response the EU Commission proposed to temporarily increase the minimum coverage to €50,000, and possibly to €100,000, to abolish coinsurance, and accelerate payouts (Europa 2008). But national interests had earlier ruled and the competitive bidding for deposits had revealed the weaknesses of the minimally harmonized EU system of guarantees.

Table 7.11 reveals that there is no common practice with respect to coinsurance, types, and currencies of deposits covered, granting of priority to depositors (and/or the insurance fund) over the assets of a failed bank, the degree of offset for loans against deposits, and the need to lodge a claim for compensation. These disparities in practices make it difficult to quickly calculate the amounts to be reimbursed in a winding up and may be particularly problematic if a cross-border bank were to fail. Moreover, the EU Directive is singularly unambitious with regard to the speed of repayment, whereas Garcia (2000) and Kaufman (2004) have argued that depositors need to be paid promptly to discourage runs and prevent fallout on the economy.

Table 7.11 Deposit insurance coverage and funding before October 2008^a

<i>Coverage at €20,000</i>	<i>To €50,000</i>	<i><€100,000</i>	<i>>€100,000</i>	<i>Has coinsurance</i>
Austria, Belgium, Bulgaria, Cyprus, Estonia, Germany ^{1b} , Greece, Ireland, Latvia, Malta, Luxembourg, Romania, Slovakia, Spain (14)	Czech Rep., Denmark, Finland, Hungary, Netherlands, Poland, Portugal, Slovenia, Sweden, UK (10)	France (1)	Italy (1)	Austria, Cyprus, Czech Rep., Estonia, Germany ¹ , Hungary ^c Ireland, Lithuania ^c , Malta, Poland ^c , Slovakia, UK ^c (12)
<i>Foreign exchange deposits are covered^d</i>	<i>Deposits carrying high interest rates are excluded^d</i>		<i>Offsets loans v deposits</i>	
Austria, Belgium, Cyprus, France, Germany ² , Lithuania, Malta (7)	Belgium, Bulgaria, Estonia, France, Germany ¹ , Hungary, Luxembourg, Malta, Portugal (9)		France, Lithuania, Romania, Spain, Sweden (5)	
<i>Payout within 1–2 months</i>	<i>Payout takes 3 months with extensions</i>		<i>Payout takes one year or more</i>	
Bulgaria, France, Germany, Netherlands (4)	The other EU countries (21)		Belgium, Romania (2)	
<i>Funding is ex ante</i>	<i>Ex post funding</i>	<i>Has state back-up</i>	<i>Has depositor priority</i>	
Belgium, Bulgaria, Cyprus ^g , Czech Rep., Denmark ^g , Estonia, Finland, France ^g , Germany ¹ , Greece, Hungary, Ireland, Latvia, Lithuania, Malta ^g , Poland ^g , Portugal, Romania ^g , Slovakia, Spain, Sweden (21)	Austria, Italy, Luxembourg, Netherlands, Slovenia, UK (6)	All ^e (Except Belgium, Cyprus, Ireland, Lithuania, Malta Luxembourg) (21)	Austria, Bulgaria, Hungary, Italy, Latvia, Poland, Lithuania, UK, Slovenia (9)	
<i>The fund has a target</i>	<i>Premium base: Insured deposits</i>		<i>Risk-bases premiums</i>	
Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Hungary, Ireland, Lithuania, Malta, Romania, Slovakia, Spain, Sweden (14)	All (except Cyprus, Greece, Malta, Netherlands, Poland, Spain) (21)		Austria, Finland, France, Italy, Sweden Germany ² , Portugal, Sweden (7)	

(Continued)

Table 7.11 (Continued)

<i>Fund can invest in own or EU government securities</i>	<i>Can invest in central bank</i>	<i>Can invest in Banks</i>	<i>Can make other investments</i>	<i>Not known^f</i>
Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Spain, Sweden, UK (15)	Bulgaria, Denmark, Ireland, Slovakia (4)	Bulgaria, Estonia, Greece, Hungary (4)	Cyprus, Finland, France, Germany, Portugal (5)	Belgium, Malta (2)

Sources: Barth, Caprio and Levine (2004); Cariboni et al. (2008); Hoelscher, Taylor, Klueh (2006); and Garcia (2000).

Notes: ^a The tables list 28 schemes in 27 countries—Germany has several schemes, one public (Germany 1), the rest are private (Germany 2).

^b The main German private system of insurance covers the haircut made by the public scheme.

^c Coinsurance is applied above a basic minimum.

^d Following Article 2 of the EU deposit insurance directive, countries exclude inter-bank and illegal deposits from coverage. Countries may also exclude deposits of other financial institutions, insiders, and government authorities.

^e The UK had said it has no public funding for depositor protection until it placed a full guarantee on deposits after the demise of Northern Rock. It is not known if the state backs deposit insurance in Ireland and Luxembourg.

^f Systems that are purely ex post (Austria, Italy, Luxembourg, the Netherlands, and Slovenia) do not have funds to invest.

^g Funding is mixed (partly ex ante and partly ex post) in 5 of the 21 countries.

Funding

Diversity extends to funding. While three-quarters of member countries maintain a deposit insurance fund, the remainder garners funds after a bank has failed. Most EU countries impose premiums only on deposits that are insured, which limit cross-subsidies but reduce the premium base. Only one-quarter charges premiums that are adjusted for the risk that the insured institution imposes on the fund.¹¹ Only a half has set a target for funding to guide the deposit insurer on the adequacy of the funding available to it. The investments that are permitted to the funds vary greatly among the different countries, often allowing the insurer to invest in illiquid securities and even (possibly unwisely) in the banks that it insures. Ex post schemes, funds that are insufficient to cover payouts, and investments that are difficult to marshal when payouts are needed, make it difficult to repay depositors (especially cross-border depositors)

promptly—a deficiency that can encourage depositors rationally to run when they begin to doubt the strength of their bank.

Structure and Ownership

Table 7.12 provides some insights into divergences with regard to the legal status of the deposit insurance body, its ownership, administration, and the composition of its board.

Table 7.12 Deposit insurance: Structure, ownership, and powers^a

<i>The deposit insurer is a separate legal entity</i>	<i>Is not a separate entity</i>	
Austria, Belgium, Bulgaria, Czech Rep., Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Lithuania, Malta, Luxembourg, Poland, Portugal, Romania, Slovakia, Spain, Sweden, UK (23)	Ireland, Latvia, Netherlands, Slovenia (4)	
<i>Deposit insurer has public ownership</i>	<i>Joint ownership</i>	<i>Private ownership</i>
Bulgaria, Cyprus, Czech Rep., Denmark, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Portugal, Sweden, Romania, Slovakia, Slovenia, UK (16)	Belgium, Estonia, Germany ¹ , Greece, Poland, Spain (6)	Austria, Finland, France, Germany ² , Italy, Luxembourg (6)
<i>Deposit insurance is administered by the government</i>	<i>Is jointly administered</i>	<i>Is privately administered</i>
Bulgaria, Cyprus, Czech Rep., Denmark, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia, Sweden, UK (16)	Belgium, Estonia, Malta, Greece, Germany ¹ , Poland, Spain (7)	Austria, Finland, France, Germany ² , Italy, Luxembourg (6)
<i>Deposit insurance board has only public members</i>	<i>Board has both public and private members</i>	<i>Board has only private members</i>
Ireland, Latvia, Lithuania, Netherlands, Poland, Portugal, Slovenia, Sweden, UK (9)	Cyprus, Belgium, Bulgaria, Czech Rep., Denmark, Estonia, Germany ¹ , Greece, Hungary, Italy, Malta, Romania, Slovakia, Spain (14)	Austria, Finland, France, Germany ² , Luxembourg (5)

(Continued)

Table 7.12 (Continued)

<i>Deposit insurer has narrow authority—pay-box</i>	<i>Has broad authority—can reorganize or aid</i>	<i>Can cancel insurance</i>
Cyprus, Czech Rep., Denmark, Estonia, Finland, Germany ¹ , Greece, Hungary, Ireland, Latvia, Lithuania, Malta, Luxembourg, Romania ^c , Netherlands, Slovakia, Sweden, UK (18)	Austria, Belgium, Bulgaria, France, Germany ² , Italy, Poland, Portugal, Slovenia, Spain (10)	Greece, Ireland, Luxembourg, UK (4)
<i>The deposit insurer can supervise</i>	<i>Cannot supervise</i>	<i>No information</i>
Germany ² , Slovenia (2)	Austria, Belgium, Bulgaria, Cyprus, Czech Rep., Denmark, Estonia, Finland, Greece, Hungary ^b , Lithuania, Malta ^b , Netherlands, Poland, Romania ^b , Slovakia, Spain, Sweden, UK (19)	France, Germany ¹ , Ireland, Italy, Latvia, Luxembourg, Portugal (7)
<i>Deposit insurer can transfer deposits</i>	<i>Cannot Transfer Deposits</i>	<i>No Information</i>
Bulgaria ^d , Germany ² , Hungary ^d , Italy ^e , Slovenia, Spain ^f , Sweden (7)	Austria, Belgium, Czech Rep., Denmark, Estonia, Finland, France Greece, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, UK (19)	Cyprus, Germany ¹ (2)

Sources: Barth, Caprio and Levine (2004), Cariboni et al. (2008), Garcia (2000) and Hoelscher, Taylor, Klueh (2006).

Notes: ^a In the table there are 28 schemes in 27 countries—Germany has both public (Germany1) and private schemes (Germany 2).

^b The deposit insurer can set supervisory standards and guidelines but cannot enforce compliance with them.

^c The deposit insurer can act as the liquidator in Romania.

^d The deposit insurer can transfer deposits covered by insurance.

^e The deposit insurer in Italy can transfer both assets and liabilities.

^f The deposit insurer can use a bank as a paying agent.

The deposit insurer is a separate legal entity in 23 EU countries. It is owned by the government in 16 countries, is jointly owned by the government and the private sector in six countries, and is privately owned in the remaining countries. The government runs the insurance scheme in 16 countries, while six schemes are privately run, and seven are jointly run

by the government and private bodies. The board of deposit insurance directors consists only of public members in one-third of EU countries, has both public and private membership in 14 EU member states, and has a purely private board in the remainder. Timely information is a *sine qua non* of successful supervision, remedial action, and deposit insurance, but it will be more difficult to share information, especially across agencies and across borders where private bodies provide, or are involved in providing, deposit insurance.

Roles and Responsibilities

Table 7.12 shows that two-thirds of European deposit insurance schemes have a very limited role—to serve as a pay-box to ferry compensation to the insured depositors of failed banks. Ten other deposit insurance authorities have broader responsibilities, which include minimizing the costs of providing coverage, and reorganizing failed banks, and/or granting financial aid. Only two deposit insurance authorities are known to have the power to supervise insured banks, while 19 lack this power. Only a quarter of EU deposit insurers have the ability to transfer the deposits of a failed bank to another entity.

VII. Conclusions and Directions for Future Research

The chapter has shown that there are substantial differences in the structure and practice of prudential supervision, failed bank resolution, and deposit insurance among member countries of the EU. The chapter also reveals, despite diligent searching, a remarkable lack of information on many of the powers available to members for dealing with and resolving seriously troubled banks. The author appeals for the authorities to obtain more information and publicly release it. How can the EU organize a united front or produce coordinated action when it does not know—or if it knows, it does not reveal—the actions that its members can take?

The EU has yet to acknowledge that the differences in supervisory and resolution practices matter; instead, it has pursued minimal harmonization in its directives. Yet, even the International Association of Deposit Insurers (IADI), which began its life expressing *no* proclivity for harmonizing deposit insurance practices across its members, has come to recognize that “certain common features are essential.”¹² It would seem that greater harmonization would serve the EU well, so the issue becomes: what practices should it adopt when it harmonizes?

The scramble to increase coverage guarantees that took place as financial panic hit Europe in October 2008 suggests that the EU might need to standardize the provision of deposit insurance. At a minimum it should set rules on maximum, as well as minimum, coverage offered in normal times and on blanket guarantees during crises. It might also want to oblige members at least to inform colleague countries in advance when invoking an emergency full guarantee. Countries might be held accountable *ex post facto* for such full guarantees, as part of the EU strictures on state aid.

Choosing other common features for troubled-bank oversight, insolvency resolution, and deposit insurance is likely to be a major stumbling block, however, because the legal systems on which they are based reflect very different social philosophies. Bliss (2003, p. 50) characterizes the English legal system (applicable in much of the British Commonwealth and in Germany, Italy, China, and Japan) as being pro-creditor, in contrast to the Franco-Latin system (applicable in Spain, Latin America, and much of the Middle East and Africa), which he describes as pro-debtor. Bliss notes that the two contrasting legal systems are rooted in “two fundamentally irreconcilable concepts of fairness.” Under English law creditors can protect their interests by asking the courts to enforce mutually agreed and explicitly executed, preinsolvency contractual arrangements that cover such things as netting and collateral. The English court is likely to recognize that “the right to set-off or net multiple contracts between a solvent and an insolvent counterparty is a matter of common law.” This contrasts with the Franco-Latin legal system, which “sees *ex ante* private contracting of creditor protection agreements as creating a privileged class of claimants to the detriment of the remaining creditors” and being fundamentally unfair in doing so. It is not clear that the EU could harmonize the multiple insolvency laws and practices without choosing one legal system to the exclusion of the other—a process that is likely to be very hard fought.

Recognizing that harmonization across the EU will be difficult to achieve, Lastra (2008) and Garcia, Lastra, and Nieto (2009) propose to confine harmonization to the set of banks that seek to cross borders. They would need to acquire a European charter (a “*societas europaea*”), which would involve European “federal” supervision by a college of supervisors and resolution under a law designed specially for resolving failed cross-border banks.¹³ Such an initiation of “federal” banking in the EU reminds the author that Bliss and Kaufman (2006) argue that the advent of federal chartering, federal oversight, failure resolution, and deposit insurance allowed the United States to overcome the diversity of its state laws and procedures for supervision, failure resolution, and deposit insurance. Maybe this is the path that the EU could follow?

In choosing which set of practices to choose as the template for the *societas euroarea*, the EU might examine the relative success of the different national systems of supervision and failure resolution in dealing with the fallout from the debacle in the mortgage and structured finance markets. Future research should reveal whether countries that have adopted the Basel Consensus on preserving financial stability have overcome the crisis better than those that have not. If they have, the EU might want to consider adopting the Basel Consensus—after it has been updated to reflect new lessons learned from current experience.

Notes

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1. Some of these lessons seem to have been forgotten during the current crisis, but that is a subject for a different paper.
2. Lacking necessary information, the chapter makes no attempt to deal with cross-country disparities in lending-of-last-resort (LOLR) operations.
3. The information has been gathered from many sources that were published at different times. It is possible that some countries have reformed some elements that are reported in the tables. For example, the UK revised its Banking Act in 2009.
4. Llewellyn (2008) reveals that Northern Rock had not had a comprehensive on-site inspection for 18 months before it got into difficulties in the summer of 2007. The FSA was so ill-informed, or so much in denial, about its fast growth in recent years and its plummeting share price in 2007 that it reduced Northern Rock's regulatory capital requirement in June 2007.
5. Although Hüpkes (2007) suggests that Denmark, Hungary, Poland and Slovakia have adopted versions of structured early intervention and resolution.
6. In the United States, the supervisor remains in charge of conservatorship, which is legally feasible but has been rarely used for banks. Under conservatorship, the troubled bank's management is replaced, but owners retain the bank's charter and their ownership interests.
7. In the Panagis Pafitis case (1996), the Bank of Greece, as supervisor, had placed a troubled bank under temporary provisional administration. The administrator called for an increase in capital without obtaining approval from the shareholders. The ECJ held that the rules of the EU's Second Company Directive required shareholders to approve calls for an increase in capital in the absence of formal insolvency proceedings that would have deprived them of their ownership rights. Hüpkes (2003) notes that the ECJ might have decided otherwise under formal insolvency proceedings, especially after the enactment of the Winding Up Directive, which allows reorganization to "affect third parties'

pre-existing rights” (Hüpkes 2008). However, Article 1(10) of the Directive says that shareholders (as well as managers) of the institution shall not be regarded as third parties. Moreover, in the Kefalas case, the ECJ decided that a reorganization involving a change in capital structure must be agreed by the shareholders’ meeting, saying that “the decision-making powers of the general meeting, provided for in Article 25 (1) applies even where the company is experiencing financial difficulties” (Hüpkes 2008).

8. In the United States it is the state or federal chartering body, the primary federal supervisor, or the Federal Deposit Insurance Corporation (FDIC) that revokes the license, places the failed institution into receivership, appoints the FDIC as the receiver, and deprives owners of their powers. While the bank is resolved under *lex specialis*, its holding company is subject to the general insolvency laws (Bliss 2003, Bliss and Kaufman 2006). Thus, the question regarding supervisors’ ability to demand additional capital is uncertain.
9. Asser (2001, chap. 10) notes that in France and Switzerland solvent banks can be liquidated by a receiver appointed under either the banking law or the company law when their license has been revoked for reasons unrelated to their financial condition, while insolvent banks are liquidated by a receiver appointed by the courts under the insolvency law.
10. Some eastern European countries that were allowed to provide a lower level of coverage when they entered the EU in 2004, since Fall 2008 have to offer coverage to €50,000.
11. Bulgaria has been planning to introduce risk-adjusted premiums.
12. “[E]ach country has different public-policy objectives that account for the wide range of deposit insurance systems and the structures within which they discharge their obligations. Notwithstanding the unique elements that may characterize a country’s deposit insurance system, there are common features identified in this paper that are essential to an effective deposit insurance system that promotes public confidence and contributes to stability” (FSF Working Group on Deposit Insurance 2000, p. 1).
13. Geithner (2008) extends the concept beyond the EU, arguing for a unified regulatory framework for all internationally active banks.

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Permanence and Innovation in Central Banking Policy for Financial Stability*

Michel Aglietta and Laurence Scialom

Abstract

In the first part of this chapter, we emphasize the adaptability and continuity of the lender-of-last-resort (LOLR) doctrine beyond the diversity of financial structures from the nineteenth century to the present day. The second part deals with the global credit crisis and the analysis of the central banks' innovative practices during the 2007–08 financial crisis. We highlight that the LOLR's role is not confined to providing emergency liquidity. It aims to provide orderly deleveraging in the financial system in order to preserve the financial intermediation process. Our conclusion underlines that the crisis management has become global and strategic. It opens the way to a major regulatory and supervisory reform.

Introduction

Since the burst of the so-called subprime crisis in August 2007, central banks have been much solicited in their capacity of LOLR. Every time such interventions arise, they reopen a lively debate over their righteousness and foster criticism on their supposed harmful side effects. With the present crisis a new chapter can be written in the historical saga of the LOLR, as central bank interventions have been unusually lengthy and have implemented renewed techniques. This chapter hopes to contribute to the new chapter.

Lending in last resort aims at sustaining the financial system's overall stability. The purpose was not self-evident at the time when banks like the Bank of England and the Bank of France were privately owned and competed with other banks for the business in securities trading. Revisiting the concept of financial stability, defined as a public good, and recalling how the doctrine emerged in the midst of recurring financial crises will provide a useful theoretical underpinning to the analysis of central bank behavior in the ongoing crisis. It will supply a yardstick to assess the many innovations devised by central banks in the course of events in the six months between September 2007 and March 2008. Were some technicalities necessary to adjust the implementation of the doctrine to the changing lending practices? Or were they rather breakthroughs that transform the conception of financial stability itself?

We argue in this chapter that the view on the LOLR shall not be normative and frozen in first principles! The reason is that financial stability is a policy objective that evolves over time. In the first part of the chapter we focus on the flexibility of the lender-of-last-resort doctrine from the 19 century to the present day. Therefore the development of new means by the central bank to better manage financial crises broadens and deepens the view on financial stability. The second part of the paper deals with the global credit crisis. We underline that the lender of last resort's role is not only to supply emergency liquidity but also to provide orderly deleveraging in the financial system in order to safeguard the financial intermediation process. Through the analysis of the central banks' innovative practices, during the 2007–08 financial crisis, we discuss the permanence of the LOLR doctrine in the current period. In conclusion we show that, since central banks have supplied direct funding liquidity to entities that were far from being commercial banks, this exposure raises a major problem. A redefinition of which financial intermediaries can be labelled "banks" and placed under the supervisory power of the central bank is a matter for future regulation.

Part 1: The Principles of the LOLR Doctrine

When the historical central banks were first created, they had different functions. They were managers of the public debt. The genesis of central banks as bankers' banks took place in nineteenth century England. It was closely intertwined with the conception of money. For the *currency principle*, enshrined in the Bank Act of 1844 that split the Bank of England's balance sheets into an issue and a banking department, the paramount function of the Bank was to enforce the convertibility of its bills into gold. However recurrent liquidity crises in 1847, 1857, and 1866 demonstrated the need for flexibility in the supply of money. The Bank Act had to be de facto suspended though not de jure.

The required flexibility in the money supply was consistent with the alternative theory of money: the *banking principle*. Money is a debt that financial institutions endogenously issue as a counterpart of their asset building. This definition is all-encompassing. It covers the commercial bank model, whereby credits make deposits. But it also fits the investment bank model in which asset acquisition is financed via leverage in collateralized borrowing. The general feature of endogenous money creation is its procyclicality, which makes it prone to financial crises.

The General Problem of the Central Banks' Dual Mandate

Currency and banking principles must be reconciled because each carries only part of the truth. The former forcefully advocates the overriding objective of anchoring the nominal unit of account. Whether via convertibility into an outside commodity (metallic standard) or via a policy rule, trust must be established in the expected long-run purchasing power of the unit of account. But with the latter it must be observed that financial cycles and subsequent crises arise in credit dynamics that are not precluded by a policy uniquely dedicated to the purchasing power of money. Financial instability became an international phenomenon with the rise of industrial capitalism. It is still very much with us.

Figure 8.1a and 8.1b display the general process of interaction in credit and asset prices that has nurtured financial crises over long periods of time. Because of the self-fulfilling nature of the process, fuelled by the mutual interaction between credit and asset prices, there is no self-adjusting market mechanism. Monetary policy only aggravated the matter by acting in a procyclical way. Left alone, the process is driven to the extreme. As its magnitude increased in the nineteenth century from one business cycle to the next, more and more devastating losses plagued the depressive stage.

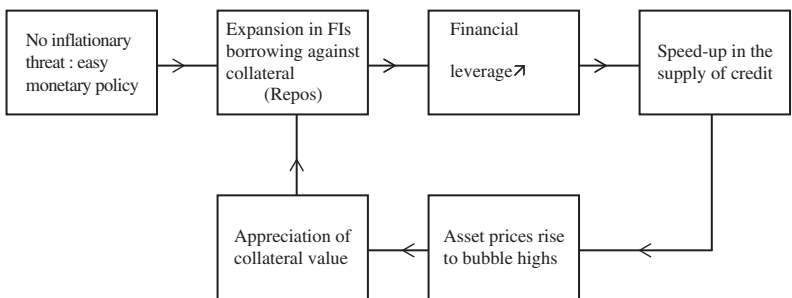


Figure 8.1a The euphoric stage of credit expansion and asset price rise

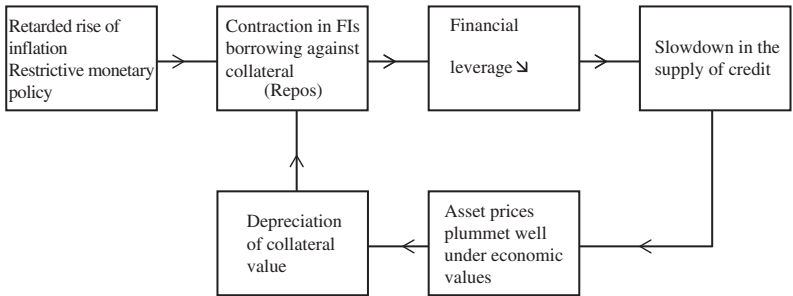


Figure 8.1b The depressive stage of credit contraction and asset price slump

As liquidity had dried up, more and more economic agents were pulled into the spiral of payment defaults. Despite bitter contentions and conflicts of interests, the view began to establish itself that something had to be done for the sake of the stability of the financial system as a whole.

*Bagehot's Lending in Last Resort: The First Response
to Overall Financial Instability*

Lending in last resort has brought out the gist of the art of central banking, although it took a long time before it became recognized. As early as 1802, Thornton had highlighted the responsibility of the Bank of England in supplying liquidity to sound banks in times of panic, but there was no follow-up on his advice. Devastating financial crises destroyed much wealth in the trough of the business cycle. It took a very long time and the acumen of a single man for the Bank of England to adopt reluctantly a stance in money markets that de facto made it the bankers' bank.

Bagehot was not a monetary theoretician. He was a practitioner and a financial journalist who acutely knew the workings of the London market. He observed that sound firms were trapped in liquidity stringency. Unable to find lenders for the cash needed to meet the payments due, they became weak links in a contagious chain of failures. There should be a lender, whose liabilities were always trustworthy, ready to lend for the sake of overall financial stability. Such a lender could be none but the Bank of England. It ought to lend without limits to solvent but illiquid firms that could not borrow in the market because the widespread mistrust of would-be lenders dried up liquidity. Insolvent firms should be sold to new owners for what they were worth.

However this predicament required an operational principle to distinguish intrinsic insolvency from threats of failure due to liquidity stringency. Bagehot (1873) proposed a distinctive criterion compatible with the model

of Figure 8.1b. What had to be done was to manage orderly deleverage in the financial system. Therefore the quality of the collateral presented by borrowers was the distinctive criterion. Bagehot proposed to solve the problem of fair value in a crude but relevant way (there were no rating agencies providing ratings through the cycle). Depressed market prices were of no use. The Bank of England should accept collateral at precrisis value and assess the solvency of the financial firms seeking its help by using such pricing.

Furthermore, to safeguard against moral hazard more effectively, Bagehot insisted that the central bank should lend at punitive rates. This provision would be both a risk premium for the central bank and a deterrent for borrowers. Finally central bank interventions in last resort should be kept as unpredictable as possible. This is the constructive ambiguity that central bankers are fond of, an attribute of the radical discretion that is the essence of monetary sovereignty. Lending in last resort shall not be viewed as an implicit contract, incomplete as it is. Financial stability depends entirely upon the unique character of universal and unconditional acceptance of central bank money. This is called sovereignty.

Indeed lending in last resort is an extraordinary operation that escapes market contracts providing a superior public good: the continuity of payments/settlements in the money markets and the integrity of the clearing mechanism for the whole economy. This operation allows liabilities to perpetuate, whereas they would otherwise have been destroyed by the spillover of the failed debts.

Bagehot's doctrine is therefore a paramount achievement that is still well alive today. Thus we now need to examine how the operating principles have been adjusted to the many changes that have occurred in the financial systems. Lending in last resort will always be controversial in the ethereal theoretical sphere, while not in the financial community, because its impact is twofold. On the one hand, it anticipates systemic risk because the social cost of letting insolvency spread is much higher than the private cost of the original failure. On the other hand, it can induce moral hazard if it fosters reckless behavior against which it provides collective insurance. Stopping contagion, while keeping moral hazard at bay, was Bagehot's purpose.

The Difficult Adoption of Bagehot's LOLR Principle in the United States

Failure to lend in last resort can have most dramatic consequences. A prominent example is the U.S. Great Depression. Another, more recent experience, was Japan's debt deflation in the 1990s. Initially, there was a lack of market liquidity. The Wall Street crash in October 1929 led to a scramble

for liquidity. At the end of that year, deflation in equity prices had been communicated to primary commodities and durable goods industries, a situation quite at odds with that of early 2008 where a huge pool of speculative capital is rushing together to successive classes of assets.

The Federal Reserve (Fed) lowered its discount rate from 6% in August 1929 to 2.5% in June 1930. But money stock continued shrinking unabated. According to Friedman and Schwartz's monetarist view, akin to the currency principle, the central bank should have undertaken blanket open market operations to avoid the seizure of credit markets. However Ben Bernanke demonstrated with detailed bank data that the underlying problem was not money scarcity. It was the disorderly deleverage in the banking system that totally disturbed the process of financial intermediation, leading to a widespread credit crunch. Indeed after mid-1930, the crisis changed in nature and in magnitude. Three waves of extended bank failures, one every year, completely wrecked the banking system, leading to the Bank Holiday of March 1933. The drastic change in regulation that followed severed commercial banks from financial markets.

The lesson to be drawn, and that was indeed drawn later, is that central bank intervention in last resort does not only provide money at critical points in time. Sometimes, with isolated incidents that threaten to become contagious, it might be sufficient. But with the damage in bank balance sheets on which the fate of other banks heavily depends, emergency liquidity funding must go hand in hand with bank consolidation. And only the central bank has the ability to monitor the whole process. In doing so, the central bank is encouraged to innovate in its operational modes.

With the return of financial crises in the wake of the financial systems deregulation, the LOLR came back in fashion with the 1970 Penn Central failure and the 1972 UK secondary banking crisis. Since then, there have been innumerable banking and financial market crises worldwide that have solicited the intervention of central banks. Interventions have covered a wide range of problems from securing the payment system in September 2001 to restoring confidence in distressed financial markets in October 1998 and dealing with the global credit crisis of August 2007 onwards. The Fed undertook specific interventions in financial institutions and dramatic changes in interest rates to restore confidence in distressed markets in the name of risk management. The first two episodes are worth mentioning.

The payment systems episode was illustrated by the break up in communication lines in the wake of the September 11 terrorist attack. The Fed massively injected liquidity through both the federal funds market and the discount window. It was a timely response to a huge but isolated shock that involved operating risk. Without this emergency supply the overnight money market would have gone to the roof. Instead it fell almost to zero,

which indicates that the intervention was indeed unlimited. Each day for a whole week, the Fed injected between \$36 billion and \$81 billion against a daily average of \$5 billion in normal times. Other central banks acted concurrently and emergency swap agreements were concluded between central banks in the world's main financial centers.

The long-term capital management (LTCM) episode in autumn 1998 was a forerunner of what is magnified in the present-day crisis. The issue is excessive leverage in the shadow banking system (hedge funds, conduits, SIVs[Structured Investment Vehicles]) with heavy counterparty risks to big banks acting as prime brokers. LTCM was a large, heavily leveraged hedge fund, with counterparty links to the main international investment banks. It was aggressively involved in a strategy of fixed income arbitrage, betting on a reduction in spread between speculative and investment grade securities. Since the end of August, a shock wave from the Russian crisis had made spreads on risky securities spike because a flight to quality wiped out the financial markets. By the end of September, private borrowers could no longer find any credit and with mammoth losses on its exposure, LTCM was unable to meet the margin calls demanded by its lenders.

The central bank was confronted with a dual issue: the direct impact of the LTCM debacle on the banking system on the one hand and the general flight to quality on the other. To solve the first problem, LTCM's debt had to be consolidated. To handle the second, the Fed had to get involved with mass psychology. How was it possible to reestablish trust in the midst of universal mistrust? The New York Fed was the coordinator in LTCM's rescue. It organized a bank consortium, which took over the fund's management in order to pilot an orderly reduction in its indebtedness and it proceeded with a \$3.5 billion debt equity swap.

To restore confidence the Fed decided to cut interest rates by 25 basis points on three successive occasions on 29 September, 15 October, and 17 November. Oh, the miracle of the alchemy that creates collective beliefs! The first one was fully anticipated and had no impact. It even deepened the crisis. The second was crucial. Taken outside the routine of FOMC's(Federal Open Market Committee) meetings, it was a complete surprise in an act of sheer sovereignty. It demonstrated to market participants that liquidity was lacking only because they thought it was lacking. With the end of the one-way selling pressure of asset holders, the central bank's sovereign decision anchored the floor price of short-term securities, setting a benchmark upon which the market could resume its job of valuing differentiated risks. The third intervention was a message of confirmation. It reassured and convinced the financial community that the central bank was determined to provide all the liquidity necessary for the correct functioning of financial intermediation.

Part 2: A New Sort of Liquidity Crisis Brings the LOLR to Adopt Innovative Practices

The Challenge for Central Banks of a New Type of Liquidity

The LTCM episode was a forerunner of the 2007–08 financial crisis. It introduced the main features currently exacerbated by the different factors that have increased the financial system’s procyclicality. Among these characteristics, the huge development of the “originate and distribute” model has drastically changed the banking business. This model rests on the securitization of any type of credit sold as illiquid securities tranches to the investing community. Credits are “structured.” The financial intermediaries in the chain of securitization processes are not commercial banks making on-balance sheet maturity transformation. They are off-balance-sheet structures intimately connected to investment banks: hedge funds and hedge fund-like entities—conduits and SIVs are nothing but hedge funds in disguise. This unregulated model has a considerably higher leverage capacity than that of the commercial bank model. It has become known as the shadow banking system.

The hedge fund finance model combines two types of leverage: a financial leverage for the different liquidity funding devices against collateral and an embedded economic leverage for the purchase of subordinated securities tranches (Figure 8.2). In securitized markets, the financial leverage is 6 (\$1.8 trillion assets with \$300 billion capital) This leverage increased before the crisis, because hedge funds invested in leveraged products to boost their returns.

Leverage generates large counterparty risks between hedge funds and prime brokers (Figure 8.3).

In good times, hedge funds use leverage aggressively to invest in more and more risky assets. They get the best price for their borrowing in making the most of the competitive market for prime brokerage. In bad times, hedge funds are very sensitive to the lack of liquidity, resulting from their

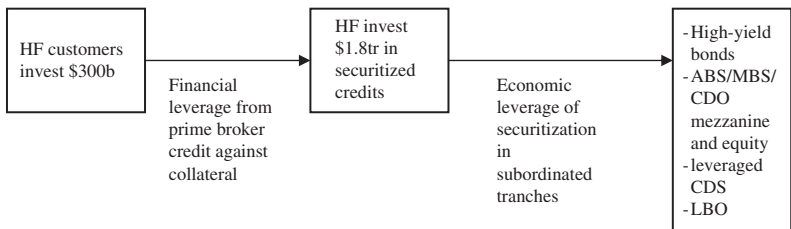


Figure 8.2 Double leverage on securitized credit

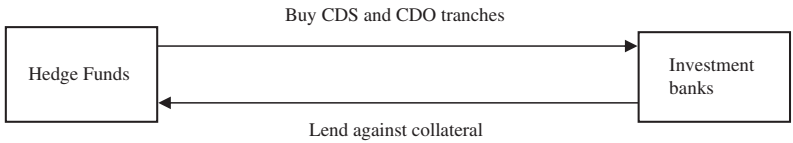


Figure 8.3 Counterparty risk

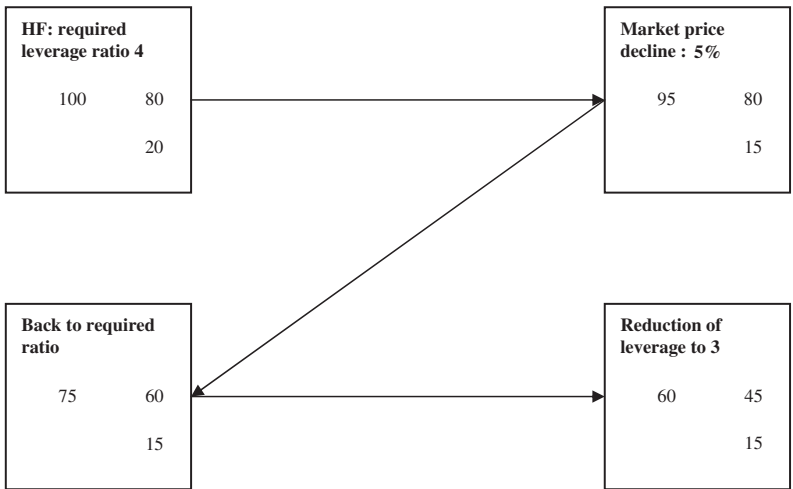


Figure 8.4 Distressed asset sales on bear market and balance-sheet contraction

portfolios’ declining value. The more hedge funds engage in leverage, the more of their liquid assets they must sell to provision their losses on the illiquid assets in stressful markets. This type of behavior spreads distress from one market to another.

Figure 8.4 illustrates the leverage destabilizing mechanism. As much as securitized assets have been downgraded, the plummeting value in the portfolio of assets raises counterparty risks. Prime brokers impose higher margins (hair cut) triggering double deleveraging: first for the decline in asset value, second for the higher margin. Let us consider a hypothetical hedge fund leveraged at four times the cash invested by its clients and that prime brokers do not want to or cannot provide financing at a higher leverage ratio. If the value of the hedge fund’s portfolio were to decline by 5%, the hedge fund would have to sell 25% of assets to maintain a leverage ratio of four. Furthermore, if prime brokers impose a leverage of three instead of four, the hedge fund would have to sell 40% of assets.

Therefore, while the speculative boom is under way, hedge funds provide extra liquidity to financial markets via leverage. However, they propagate

systemic risk in bear markets whenever the slump in the markets drastically curtails their collateral value. Incipient losses lead to a liquidity dry up, which in turn, induces investment banks to upgrade the margin calls that hedge funds try to meet through the distress sale of whatever assets they can sell.

This sweeping change in the structure and functioning of the financial system magnifies the procyclicality due to the adoption of new accounting rules immediately validating market prices. Since market-wide events are perceived simultaneously by all market participants, their reactions are synchronized and fuel the price decline and the reappraisal of risks (Adrian and Shin 2008). With mark-to-market accounting, changes in asset prices rapidly impair the net worth of all the participants in the financial system. Consequently, in times of stress, a tightening in market liquidity quickly translates into changes in the banks and market intermediaries' (shadow banks) equity base. There is a dynamic interaction between the liquidity and solvency of financial institutions, because if market participants have misgivings about the solvency of their counterparts, they cut off their access to funding, and so they themselves cause the solvency problem that they fear.

All market participants know these new interrelationships between market illiquidity and funding illiquidity¹ and the blurred frontier between illiquidity and insolvency in a market-based financial system. This common knowledge largely explains the new characteristics of the liquidity crisis that gives to uncertainty—in the Knightian sense—a crucial role.

In summer 2007, despite the small size of the U.S. subprime mortgage sector relative to the world financial system, its difficulties led to disruptive developments in many financial market segments the world over. One major surprise was the amplitude and rapidity of the transmission to the very core of the financial system, for example, the interbank market. The heart of this crisis is a rise in uncertainty—unknown and nonmeasurable risk. The financial instruments and derivative structure underpinning the recent growth in credit markets are complex and difficult to evaluate. The growing uncertainty surrounding the valuation of structured credit instruments affected their liquidity and caused difficulties in the asset-backed commercial paper (ABCP) the shadow banks issue to fund their collateralized debt obligations (CDO) holdings. Widespread uncertainty about the distribution of exposure to subprime losses across financial institutions made it impossible to distinguish sound from unsound financial institutions, then leading financial institutions to refuse to provide funding to each other due to concerns over counterparty credit risk. The fear that some yet to be identified institutions might next reveal large exposure to subprime made banks sceptical about the creditworthiness of any financial institution, especially those with the greatest willingness to borrow in money markets. So we were faced with a typical “lemons” problem.

On 9 August, BNP Paribas announced that the quotation of three of its funds needed to be suspended and that it would freeze withdrawals from them, stating that illiquidity in the respective markets prevented it from valuing assets. This announcement was a powerful market trigger. The interbank market came under extreme strain, Europe's overnight interest rate spiked and financial institutions started to hoard term liquidity, simultaneously causing a gridlock in funding markets. Central banks immediately supplied very large quantities of reserves in response to pressing bank demand.

The disruptions in interbank trading were compounded by the banks' uncertainty about their own liquidity needs. It is an unusual crisis because it is not related to a quantitative lack of liquidity, rather to a concern about the availability of funding to meet prospective future commitments. Accordingly, three-month wholesale markets dried up as banks sought to pile up funds internally and ran to the safe quality of Treasury bills.

This crisis reveals the powerful and potentially devastating self-reinforcing dynamics between market and funding illiquidity (IMF April 2008). The central banks as LOLR are supposed to provide funding liquidity both to individual institutions and to the market as a whole, through either market interventions or bilateral lending. By signalling their willingness to sustain liquidity through their actions and active communication policy, central banks can try to restore confidence in the financial system by limiting the fire sales of assets and supporting interbank lending. Nonetheless they have to adjust their tools and types of actions to the specificity of this crisis. This last point will be the next focus in our analysis.

The Central Banks' Innovative Initiatives

Because of the specific nature of the financial distress, central banks' tools and practices were renewed and adapted during the crisis. The adaptation process engaged by each central bank was conditioned by the operating frameworks they have in place (Borio and Nelson 2008). Monetary operating frameworks establish the means by which central banks implement their desired monetary policy stance. It includes the rate policy that signals the desired policy stance, the liquidity management operations with a key distinction between discretionary operations and standing facilities (lending and deposit facilities), the maturity and frequency of discretionary operations, the counterparty arrangements, and the range of eligible collateral. All these components of the monetary operating frameworks may vary considerably from country to country. So, the need for innovations in the central banks' tools and practices largely depends on the existing

monetary operational framework. For instance, counterparty arrangements differ largely among countries. In the euro-area as well as in Australia and Switzerland, the range of eligible counterparties is very broad and common across operations. At the other end of the spectrum, in the United States and to a lesser extent in Canada, the set of counterparties for discretionary operations is considerably smaller than that with access to standing facilities.

Such significant differences in the domestic monetary operational device largely explain the differences in the LOLR innovations needed to respond to the specificity of the interbank market crisis. Nevertheless, central bank interventions to alleviate the recent financial turmoil exhibit large similarities.

The first challenge faced by central banks was the changing maturity composition in banks' net demand for funding liquidity with an increase in the net demand for term funding relative to overnight funding. This phenomenon was partly due to the large-scale reintermediation of conduits. Indeed, during the market crisis, some market participants purchased assets from or extended credit to the off-balance-sheet vehicles that they had created and the money market funds that they managed even though they had no contractual obligation to do so (Basel Committee on Banking Supervision 2008). Such decisions might reflect reputation concerns, but mainly the counterparty risk involved in a disorderly deleveraging of the conduits. The need for longer financial assistance resulted from this reintermediation process. To a varying degree, all central banks increased the availability of term funding supplied to the market through discretionary operations.

The second challenge faced by central banks was a breakdown in the usual liquidity distribution channels. In their open market operations, many central banks do not deal directly with all the commercial banks and securities firms but only deal with a prespecified range of counterparties who redistribute the liquidity into the banking system. During the period of stress that began in August 2007, the banks' reluctance to lend to each other inhibited a smooth distribution of reserves and constrained several central banks to adapt their tools. The need for such innovations in central bank liquidity operations was reinforced by the banks' reluctance to use standing facilities, discount windows, or marginal lending facilities to avoid disclosing their financial weakness. The purpose of the standing facilities is to support settlement in the payment system by providing collateralized overnight loans to direct participants in the payment system, who are experiencing temporary shortfalls in their settlement balances. Generally, banks pay a penalty rate for this direct source of liquidity, but the set of counterparties and the eligible collateral are wider for standing facilities than for open market operations. Nevertheless, using such bilateral lending was perceived by banks as a stigma, which signals their

financial difficulties to the other market participants. So, banks with liquidity needs will do everything they can to avoid signalling their weaknesses because transparent provision of liquidity in such circumstances can be interpreted as a confirmation of vulnerability, causing their interbank counterparties to react in the exact manner that the financial support is supposed to prevent. This stigma has been strongest in the United States probably because a similar facility had been used to provide emergency liquidity assistance in the past. Because of the stigma, there was relatively little use of standing facilities even on days when interbank rates rose above the interest rates on the facilities. This stigma was particularly powerful in countries where differences between open market operation and standing facility counterparty groups and eligible collateral were most pronounced. The Fed tried to alleviate the stigma by reducing the discount rate spread in the fed funds by 50 bp on 17 August. That also actually means a reduction in the penalty rate.

From 18 September 2007 to 30 April 2008, the Fed followed a policy of sharp reduction in its federal funds rate (seven cuts totalling 325 basis points) coupled with a reduction in the premium on primary lending from 100 to 50 and then to 25 basis points.

Table 8.1 Central bank counterparties before the crisis

	<i>Federal Reserve</i>	<i>ECB</i>	<i>Bank of England</i>
	<i>Regular Open Market Operations</i>		
Counterparties	20 primary dealers	300 to 500 banks (potentially 1700)	About 40 banks and securities firms
Range of eligible collateral	Narrow	Wide	Intermediate
Pricing	Bid price: Fed funds rate as guideline	Bid price above minimum rate	Fixed price
	<i>Standing Facilities</i>		
Counterparties	7500 credit institutions	2400 credit institutions	About 60 banks
Range of eligible collateral	Wide	Wide	Intermediate
Pricing	Fixed price	Fixed price	Fixed price

In order to ensure that liquidity provisions are distributed efficiently even when the unsecured interbank market was under stress, and to avoid the stigma associated with standing facilities, the Fed announced a temporary Term Auction Facility (TAF)² on 12 December 2007. The TAF

is a credit facility for terms of 28 or 35 days that allows a depository institution to place a bid for an advance from its local Federal Reserve Bank at an interest rate that is determined by the result of the auction. This new policy tool differs from open market operations because it involves all of the over 7000 commercial banks in the country rather than just the 20 primary dealers and the collateral accepted is much broader³ than with the standard repo. It also differs from the discount window because it offers anonymity to the bidders and so it did not carry any stigma. Moreover, the TAF rules allow banks to pledge collateral that might otherwise have very low market value. According to S. Cecchetti (2008), with the TAF, the Fed is taking collateral at a price that is almost certainly above what the banks could get for it anywhere else.

Because of a lack of confidence in the assets created from the securitization of bank loans, more especially mortgage-backed securities (MBSs), it has become very difficult for banks to exchange these assets for cash. Banks have on their balance sheets an “overhang” of these assets that they cannot readily sell or use to secure borrowing. This overhang has created uncertainty about the banks’ financial position. As a result, they have been reluctant to lend even to each other. So the illiquidity of certain class of securities, and in some cases the disappearance of the market they are traded in, is the main cause of the funding problem faced by banks. Moreover, worsened by the mark-to-market accounting principle, the solvency of financial institutions was also threatened by market illiquidity. In order to tackle these serious funding and solvency problems, central banks worldwide have extended their lending facilities but also widened the range of collateral accepted for their operations. They also created new tools to finance part of the overhang of illiquid assets by exchanging them temporarily with more easily tradable assets. The banks could then use these liquid assets to finance themselves more normally. The Fed and the Bank of England became involved in such innovative practices whose aims are to improve the liquidity position of the banking system and enhance confidence in financial markets.

This way, the Term Securities Lending Facilities (TSLF) announced on 11 March was an additional step by the Fed to directly improve liquidity conditions in key credit markets. It is a more precise tool for addressing the dislocations in the credit market by striking at the core of the financial problems, namely, MBSs. Under the TSLF, the Fed temporarily swaps more of its Treasury holdings for private sector troubled assets. As with TAF, this new liquidity tool works primarily by changing the composition of the asset side of the Fed’s balance sheet. More precisely, according to the Federal Reserve’s Board of Governors, “Under this new Term Securities Lending facility the Federal Reserve will lend up to \$200 billion of treasury

securities to primary dealers secured for a term of 28 days (rather than overnight as in the existing program) by a pledge of other securities including federal agency debt (including debt issued by Fannie Mae and Freddie Mac), residential-mortgage-backed securities (MBS) and non-agency AAA/Aaa-rated private label residential MBS . . . securities will be made available through an auction process.”⁴ So the range of TSLF (bonds for bonds transactions) collateral is the same as for TAF loans (bonds for cash transactions), which is similar to that for the discount window.

By allowing the primary dealers to temporarily swap illiquid assets such as MBS for highly liquid Treasuries “the TSLF intends to promote liquidity in the financing markets for Treasury and other collateral and thus foster the functioning of financial markets more generally.”⁵ With this extension of the Fed’s long-standing securities lending program, it is expected that, if primary dealers can exchange MBS for Treasury bills through TSLF, then traders and asset managers would be less reluctant to hold them back again. As reported by S. Cecchetti (2008), in the 27 March 2008 first auction, the Fed offered \$75 billion face value securities. It received \$86.1 billion in bids and the winning bid was 33 basis points. This means that for 33 basis points a dealer could exchange a residential MBS that might be selling at discount, bearing a risk premium of up to several hundred basis points for a Treasury security. So, TSLF constitutes an institutional response to the market valuation problems faced by this sort of assets but it also increases credit risk for the central bank.

On 21 April 2008, the Bank of England announced a “special liquidity scheme” (SLS), which seems quite similar to TSLF.⁶ Indeed, this scheme allows banks and building societies to swap some of their illiquid assets for liquid Treasury bills for up to three years. More precisely, the Bank of England presents the new device as follows:

- “The assets swaps will be for long terms. Each swap will be for a period of one year and may be renewed for a total of up to three years.
- The risk of losses on their loans remains with the banks.
- The swaps are available only for assets existing at the end of 2007 and cannot be used to finance new lending.”

Under these swap arrangements, the banks remain the owner of the illiquid assets they offer to the Bank of England. When a swap transaction ends, the assets are handed back to the banks in exchange for the return of the Treasury bills.

In a briefing note providing information about the purpose and nature of this initiative, the Bank of England explains: “Banks will be required to

pay a fee to borrow the treasury bills. The fee charged will be the spread between the three-month London Interbank interest rate (Libor) and the three-month interest rate for borrowing against the security of government bonds, subject to a floor of 20 basis points.” This means that the banks borrow from the Bank of England through the SLS at an unsecured rate (London Interbank Borrowing Rate [LIBOR]) even if their borrowing is collateralized by MBSs. Nevertheless, as previously mentioned, banks are reluctant to lend mutually at the LIBOR rate, so, we totally agree with Willem Buiter when he notes that the market rate for borrowing against the type of MBS collateral the banks are offering to the Bank of England will be higher than LIBOR and concludes that by doing so the Bank of England does not subsidize the banks. It corrects a form of market failure—the illiquidity of such assets.⁷ The briefing note previously quoted also clarifies the haircuts applied for the valuation of the illiquid assets: “The Bank of England will decide the margin between the value of the Treasury bills borrowed and the value of the assets banks are required to provide as security. For example, if a bank were to provide £100 of AAA-rated UK residential mortgage-backed securities, it would, depending on the specific characteristics of the assets, receive somewhere between £70 and £90 of treasury bills.” Moreover, the SLS holds that if the value of the assets pledge as security decreases, the banks must compensate this fall by providing more assets or by returning some of the Treasury bills it received in the swap arrangement, and if the assets pledged as security were to be downgraded, the banks would need to replace them with other highly rated assets.

With such provision, the Bank of England seems largely protected against credit risk. Nevertheless, the Bank of England bears the risk of joint default by the borrowing bank and the issuer of the illiquid assets. The probability of such joint default is not equal to zero because MBS backed by mortgage originated by the bank offering the MBS to the bank of England in the SLS or by a corporate belonging to the same financial conglomerate are not forbidden.

On 14 March 2008, the Federal Reserve Bank of New York issued a loan directly to Bear Stearns. Since it is not a commercial bank under the strict regulatory umbrella that accompanies membership in the Federal Reserve System but an investment bank, Bear Stearns could not obtain a traditional discount loan. This was really an extraordinary move. Not since the 1930s had the Fed actually made a loan based on paragraph 3 of section 13 of the Federal Reserve Act which authorizes the Federal Reserve Banks—with the previous agreement of the board of governors—to lend to any individual, partnership, or corporation provided that the borrower is unable to obtain funding from a bank. In addition to this exceptional lending through the discount window, the Fed provided special financing in connection with

the acquisition of Bear Stearns by JP Morgan. Indeed the Fed funded up to \$29 billion of Bear Stearns' less liquid assets, while JP Morgan met the first \$1 billion loss.

On 16 March the Federal Reserve announced the setting up of a new procedure called the Primary Dealers Credit Facility (PDCF) which is an overnight loan facility that provides funding to primary dealers⁸ in exchange for a large range of eligible collateral including all investment grade corporate securities, municipal securities, MBSs, and assets-backed securities for which a price is available. The program was announced to last for six months or longer if events warrant. The loan rate is the Federal Reserve Bank of New York's primary credit rate, currently 25 basis points above the target federal funds rate. This new facility was a sort of systematization of the Bear Stearns liquidity assistance. By giving all the large investment banks direct access to discount window borrowing, this new facility represents a complete break with the past. Previously, investment banks did not have access to either discount window borrowing or the TAF, which were both restricted to regulated depository institutions. This program is also authorized under paragraph 3 of section 13 of the Federal Reserve Act, which allows lending to nonbanks under "exigent and unusual circumstances." Such provision suggests that there is a fundamental difference between PDCF and the Fed's normal operations. Indeed, the privileges for banks that come from belonging to the Federal Reserve System—access to emergency liquidity—come with regulation costs so that banks with direct access to Fed credit do not take excessive risks. Yet, although the primary dealers are subject to capital requirements, they do not fall under the same constraining regulatory framework as the banks.

Investors' concerns about financial institutions became more acute over the summer, as mortgage-related assets deteriorated further. At the beginning of July, Fannie Mae and Freddie Mac suffered very strong pressure. Investors lost confidence in them because their capital was dramatically insufficient regarding mounting losses. Holders of their debt becoming very fearsome, their access to liquidity in capital markets threatened to dry up. Leading their stock prices sharply down. In order to curb the liquidity crisis, the Board of Governors of the Federal Reserve System announced on 13 July that it had empowered the Federal Reserve Bank of New York to lend directly to Fannie Mae and Freddie Mac. All lending would be at the primary credit rate and collateralized by U.S. government and Federal agency securities. This direct access to emergency liquidity assistance gave the two GSE (Government Sponsored Enterprises) a respite concerning liquidity pressure but didn't constitute a response to their undercapitalization. Asian creditors sold large amounts of the GSEs' debt in August, threatening a dollar crisis. The globalization of the problem convinced

the treasury to act decisively on 7 September. The U.S. government took control of the two mortgage finance companies in a move that is tantamount to nationalization. At the same time, the Treasury and the Fed established a Government Sponsored Enterprise Credit Facility (GSECF) to lend to Fannie and Freddie with a maturity between one week and one month against collateral consisting of RMBS issued by the two GSEs and by advances made by the Federal Home Loan Banks. This is a Treasury facility and not a Fed facility. So it means that in this operation the New York Fed acts as agent of the Treasury providing its expertise, not its own financial resources. Moreover, the Treasury has established a GSE Mortgage-Backed Securities Purchase Program (GSEMSBPP) through which it purchases GSE mortgage-backed securities outright in the open market. This is really new. It is the first time that an intervention takes the form of such an outright purchase rather than a repo operation or other collateralized loan or swap. This operation supports both the RMBS market and the two GSEs.

After the Freddie Fannie rescue, the crisis mutated instead of calming down. Investors all over the world became convinced that the banks not only in the United States had too little capital to manage their plummeting asset values. The concern over insolvency fed back on wholesale money markets where interbank lending went to a standstill. In the deteriorating mood, the decision to let Lehman Brothers go under triggered a wholesale flight to quality with every market but the safest government securities plunging together. From that time on, not only did the world central banks support the money markets, but they replaced them entirely. Meanwhile the shock wave of Lehman's failure precipitated distress in banks in the United States and in Europe and quasi-destroyed American International Group (AIG), the largest U.S. insurance company. Therefore the Fed and other central banks had to take ever more extraordinary actions in shorter and shorter lapses of time.

On 14 September in response to the worsening of the liquidity and credit crisis, the Federal Reserve Board announced an enhancement to its existing liquidity facilities which took the form of a significant broadening in the collateral accepted at the PDCF and TSLF programs as well as an increase of the amounts offered under TSLF. From 14 September on, the crisis became systemic.

Bank of America purchased Merrill Lynch on 14 September for roughly \$50 billion while Lehman Brothers, filed for bankruptcy protection and hurtled toward liquidation after it failed to find a buyer. The decision not to put public money behind a bailout of Lehman Brothers entailed a downward spiral in equity markets all over the world and induced a complete freeze in money markets. The importance of Lehman's counterparty

role on the opaque over-the-counter (OTC) credit derivatives markets has probably been underestimated by the Treasury and the Fed.

On 16 September, the Fed with full support of the Treasury injected \$85 billion into AIG—one of the biggest insurance company in the world—under section 13 (3) of the Federal Reserve Act in return for a government stake of 79.9% and effective control of the company. The AIG facility has a 24-month term and bears a penalty rate of three-month LIBOR plus 850 bp, giving AIG a strong incentive to repay it as soon as possible. The Fed loan to AIG has been secured on all AIG's assets including those of its subsidiary companies.

In this context of widespread liquidity freeze, a few money market mutual funds (MMFs) had difficulty meeting demands for redemptions at par because they had bought CDS on the failing financial institutions. It launched immediately a run on MMFs by panicky customers, stating an incipient liquidity crisis in retail markets. The deposit insurance was extended to MMFs, and the Fed created a new facility specifically dedicated to money market mutual funds Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) on 19 September.

The financial turbulence has demonstrated that global channels for distributing liquidity across borders may become seriously impaired. Indeed, the interbank markets are linked across countries by the activity and funding needs of banks doing cross-border business on a large geographical scale and holding assets and liabilities denominated in varying currencies. That's why, in addition to domestic operational responses, central banks have further strengthened their cooperation throughout the turmoil. It was particularly and systematically the case from mid-September 2008 onwards, when the Fed trying to address dollar funding pressures worldwide announced a significant expansion of reciprocal currency arrangements with foreign central banks including an approximate doubling of the existing swaps lines with the European Central Bank (ECB) and the Swiss National Bank.⁹ On September 2008, in response to continued strains in short-term funding markets, ten central banks announced further coordinated actions to expand significantly the capacity to provide U.S. dollar liquidity. As regards the specific actions in the euro-area, the Federal Reserve and the ECB decided to double their temporary reciprocal currency arrangements (swap lines) from US\$120 billion to US\$240 billion. This reciprocal swap facility has been authorized through 30 April 2009.

Nonetheless credit and liquidity crisis went on unabated in early October, prompting more dramatic actions that get closer to a coordinated central bank policy to save a global financial system that has got self-destructive. On 29 September six central banks organized a huge swap networks to inject liquidity wherever needed. It was the first significant step to provide global solution to the financial hurricane. However more steps are

needed that involve not only central banks, but governments. On 8 October, the six central banks mounted the first monetary policy coordination ever in agreeing a common 50 bp in their lending rates, while the central bank of China acted in the same direction (27 bp) concomitantly.

Table 8.2 Summary of the steps taken by the ECB, the Fed, and the Bank of England during the financial turmoil

	<i>ECB</i>	<i>Fed</i>	<i>BoE</i>
Exceptional fine-tuning (frequency, size of operations, conditions)	+	+	+
Exceptional long-term open market operations	+	+	+
Broadening of eligible collateral		+	+
Change in the lending standing facility		+ (Reduction in the penalty rate and access to the discount window for investment banks through PDCF)	
Broadening of counterparties		+ (TAF)	+
Temporary swaps of illiquid assets for treasury bills		+ (TSLF)	+
Direct loan to investment bank, GSEs, insurance and Money Market Mutual Funds		+ (Bear Stearns, PDCF, AIG, Fannie and Freddie, Money Market Mutual Funds)	(SLS)
Coordinated actions among central banks to provide foreign exchange liquidity	+	+	+

Were the Central Banks Paraphernalia Really Successful?

As shown above, central banks have indulged in a lot of technicalities since August 2007: they have played around with maturities in their interventions, widened the range of accepted collateral, and resorted to auction in order to set up a new facility. They tried to follow the pattern of bank liquidity needs more closely. But does it make a difference for the stress that plagues money and credit markets? Looking at the indicators displayed below, we may have doubts.

Nonetheless a radical innovation stands out. It happened in mid-March 2008. While Bear Stearns was about to file for bankruptcy protection, the Fed did not allow it to do so. For the first time ever, it decided to lend directly to an investment bank. It triggered the immediate expectation that the whole investment banking profession had been placed under the Fed's franchise. This belief was confirmed by the PDCF that extends the umbrella of the LOLR to the entire investment banking industry. The Fed removed from the market the awesome belief that a rolling collapse of

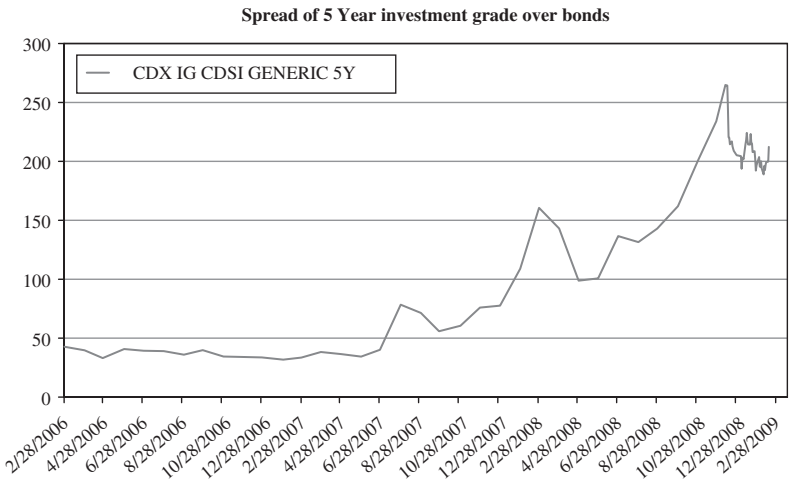


Figure 8.5 Spread of 5-year investment grade over bonds

the biggest investment banks had become a real possibility. The long-run consequences of such a landmark in bank regulation have yet to be drawn. However, in the short run, it has had noticeable effects.

The cost of insuring against default through credit default swaps is directly expressed as a spread over the rates on similar treasury bonds. Higher spreads mean higher effective insurance premiums. This is a basic measure of stress in the credit markets as a whole. Figure 8.5 depicts the spread.

One can see that the spread has more than doubled in the early months of 2008 after the plateau of 80 bp reached in late December 2007. Then the spread surged almost unabated. Even the heavy Fed's reaction at the end of January only had a very short-run effect. The spread culminated with the Bear Stearns's demise. Since the Fed's dramatic decision the spread has substantially receded, though it stays at a very high level compared to the precrisis situation.

Another indicator probes into the turmoil on the interbank money market. This is the 3-month LIBOR spread over treasury bills of the same maturity, the so-called TED spread (Figure 8.6).

In quiet times the spread is almost constant at 40 bp. It spiked to 180 as soon as the crisis started, reflecting the acute banks' needs for 3-month funding. Despite the multifaceted central bank actions, renewed tensions in credit markets foster new waves of funding needs. The spread had fluctuated around the 150 bp level for several months following the Bear Stearns rescue and the working of the PDCF. However the crisis worsened considerably in

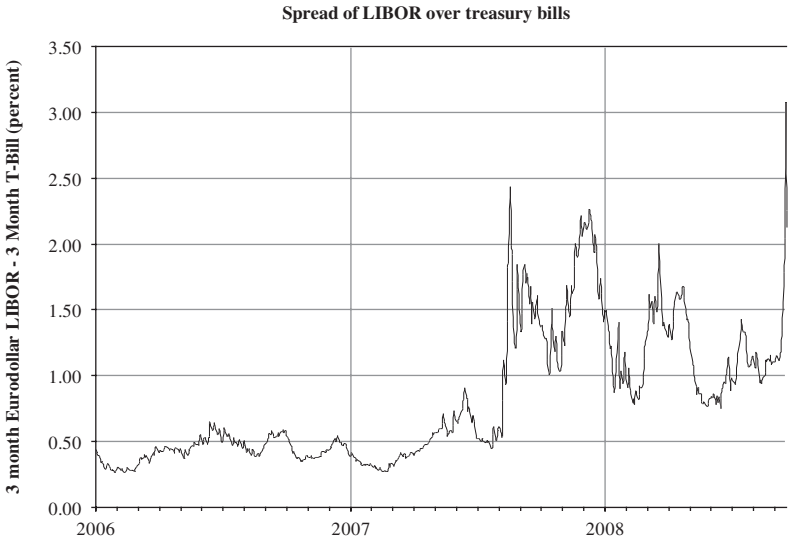


Figure 8.6 Spread of LIBOR over Treasury bills

September following the distress and nationalization in the GSEs and in AIG. Because AIG was a huge counterpart in the CDS markets, turmoil erupted and jeopardized the money market funds that are sellers of credit protection. The wholesale money market seized up and to be supplemented entirely with central bank credit lines, including huge swaps to supply dollars abroad. In this context the TED (T-Bill and ED) spread spiked at the unprecedented level of 300 bp, revealing the acute state of distress and lack of confidence.

Conclusion

In September 2008 the crisis gained considerable momentum. Despite spectacular actions by U.S. monetary authorities, liquidity stringency had become more and more acute and widespread. However bold and innovative, the multiple new facilities to provide access to central bank money in emergency did not succeed to quiet markets. Furthermore the scramble for liquidity had reached European banks. The rush for evaporating liquidity to make dollar payments outside the United States has prompted larger and larger coordinated interventions by the main central banks. However the systemic crisis has moved beyond LOLR innovations. It has become commonly understood, since July 2008 with the rescue of Fannie Mae and Freddie Mac, that the root of piled-up losses stem from insufficient bank capital and massive risk undervaluation that cannot not be cured by liquidity injections alone.

Therefore the role of the U.S. central bank and its relationship with the Treasury on one side of the Atlantic, of European governments and the ECB on the other side, has changed while the crisis has matured. The essence of stand-alone LOLR policy is reactive and tactical. It was hoped that restoring orderly market liquidity would enable banks to overcome temporary financial fragility. However overleveraged investment banks had recurrent problems of short-term funding in wholesale markets that spread to commercial banks, as much as the value of their collateral was plummeting. It is why the U.S. central bank has created facilities tailored to brokers dealers, then opened credit lines to almost any financial institutions to end up lending insecurely to nonfinancial firms. The U.S. central bank handled new rounds of liquidity stringency with new types of credit lines from December 2007 to March 2008. Because it lodged credit risk on its balance sheet, it got the backing of the Treasury. However the central bank kept the initiative.

The relationship changed completely while capital problems had become paramount from July 2008 on. The Fed has extended more liquidity and for longer than before, but it has become the arm of the Treasury in much more complex rescue packages. The stake of emergency plans turned to nationalizing de facto too big or too connected financial institutions. However from the GSEs to AIG, the policy was still reactive and piecemeal. Nonetheless, while interbank markets seized entirely and world Stock markets slumped altogether on 18 September, Hank Paulson and Ben Bernanke were convinced that a decisive action was needed. They proposed a threefold plan: a giant public resolution fund to buy bad debts, an unlimited credit lines to MMFs granted by the Fed under a blanket Treasury guarantee, and an interdiction of short selling in the stock market.

Therefore crisis management has become global and strategic. It opens the way to regulatory and supervisory reform, whereby the Fed will be granted much extended power over a larger banking system, encompassing investment banks and interconnected shadow banks. The Fed is studying ways and means of countercyclical macro prudential policy to complement monetary policy in pursuing the dual objective of financial stability and price stability.

Notes

* Code JEL E58, G12, G18, G21.

1. Funding illiquidity occurs when solvent financial institutions have difficulty borrowing immediate means of payment to meet liabilities falling due.
2. <http://www.federalreserve.gov/monetarypolicy/taf.htm>.
3. Any collateral eligible to secure discount window loans.

4. Press release: <http://www.federalreserve.gov/newsevents/press/monetary/20080311a.htm> (accessed May 30, 2009).
5. Press release: <http://www.federalreserve.gov/newsevents/press/monetary/20080311a.htm> (accessed May 30, 2009).
6. Press release: <http://www.bankofengland.co.uk/publications/news/2008/029.htm> (accessed May 30, 2009).
7. *Financial Times* 25 April 2008, <http://blogs.ft.com/maverecon/2008/04/is-the-bank-of-england-subsidising-the-banks-through-the-special-liquidity-scheme/>
8. Primary Dealers are banks and securities brokers/dealers that trade in U.S. government securities with the Federal Reserve Bank of New York.
9. The U.S. dollar TAF started in December 2007. According to this arrangement the ECB agreed with the U.S. Federal Reserve to grant loans in dollars to euro area banks. The scope of this facility has been expanded with the decision on 18 September to start providing U.S. dollars funding to European counterparties also on an overnight basis and to increase the amounts offered in the existing operations at longer maturities (28 and 84 days).

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