

**SOME HELP IN UNDERSTANDING
BRITAIN'S BANKING CRISIS, 2007 – 09**

By

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Roger Alford spent almost the whole of his career at the London School of Economics. His particular interest has been the British monetary system and for many years he was responsible for the undergraduate Final Year Monetary Economics Specialist Group. His early years included brief experience on the Stock Exchange and in the London Discount Market followed by two years on secondment to the Bank of England. He retired in 1992 but has been a regular attendee at the FMG Financial Regulation seminars for many years. Any opinions expressed here are those of the authors and not necessarily those of the FMG. The research findings reported in this paper are the result of the independent research of the authors and do not necessarily reflect the views of the LSE.

PRINCIPAL POINTS

Although Britain's banking crisis received wide coverage in the media, this did not provide the public with any clearly structured account of its financial events and left most people feeling that they had no clear understanding of what had happened. To this extent the media failed in their duty to educate public opinion.

The balance sheet approach set out here provides a clear and consistent framework that is essential for any real understanding of the crisis: how some banks came to face imminent failure and the operations by the Bank of England and the government that saved them.

This approach is used to give structure to a brief account of the main financial events affecting the banks which had to be rescued. Detail is limited by the lack of information.

The immediate sources of Britain's banking crisis were:

1. the failure of managements in the banks concerned, whose competition for growth, particularly growth by acquisition, blinded them to the fact that they were acquiring large amounts of assets of declining quality, with growing dangers to their solvency and liquidity.
2. reliance upon risk-sensitive inter-bank borrowing, rather than more stable retail deposits, to fund this rapid growth in assets.
3. the failure of light touch bank regulation, which can be traced back to Greenspan in the USA and was introduced into Britain by Gordon Brown when Chancellor of the Exchequer. The Financial Services Authority (FSA) implemented light touch regulation and this left the British banking system without any effective supervision.
4. the failure of those managing the FSA, who should have had the broad knowledge and experience of the banking system and its history of occasional upsets and crises, to question publicly the adequacy of the light touch regulation imposed upon them by a politician.
5. the failure of effective due diligence in takeovers; this played a major role in the crisis.

Following the crisis the most significant reform has been in the FSA, which has abandoned light touch regulation and reverted to something resembling the type of supervision exercised earlier by the Bank of England (which is now about to be given back responsibility in this field). This new regime promises to be effective.

There have been many suggestions for reform; some leading ones are mentioned and several are criticized.

The question of how to deal with a sectoral problem, such as Britain's housing boom, remains unresolved.

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1. INTRODUCTION

From the autumn of 2007 to the spring of 2009 the media in Britain were full of alarming reports about the western world's financial system and the dangers facing British banks, culminating in the news that some of these banks had been saved from imminent collapse at enormous public expense. But while there was a vast amount of news and comment, most people were left feeling that they had no clear understanding of just what had happened. This paper uses a schematic and minimal version of the balance sheet approach to banks and banking to clarify and explain the events of Britain's banking crisis.

Our use of the balance sheet approach makes it clear that this framework imposes a fruitful discipline on the description and discussion of the events of the banking crisis and indeed of banking operations in general. For any balance sheet item, it requires us to be clear about which side of the balance sheet it is on: when talking about reserves, are these capital reserves on the liabilities side? or liquidity reserves on the assets side? And when talking about a change in a balance sheet item, it requires us to remember that entry changes must occur in pairs – where on the balance sheet is the related entry? and what is its significance? Our schematic minimal balance sheet emphasises a bank's capital and liquid assets because in a system open to shocks these are the potentially fragile points of a bank at which failure can occur and remedial action has to be focussed. It can help us to answer confusing questions: will a shock write-down of earning assets reduce a bank's liquidity? (after all, both these items are on the assets side of the balance sheet) and if a bank suffers a shock withdrawal of deposits will this reduce its capital? Exactly how might a bank arrive at the brink of failure? and if a bank has been bailed out, has it been provided with additional liquidity? or additional capital? or both? and by whom? and how?

But this explicit and illuminating balance sheet approach played virtually no part in the reporting and discussion of the banking crisis in the media. Journalists reported news items but most of them evidently had no knowledge of balance sheets and therefore could not draw upon these to clarify or add anything of explanatory value to their stories, and the same was true of most non-financial commentators. Financial commentators were, of course, conversant with balance sheets but they seemed to feel that it was beneath them to show the public how useful the balance sheet approach

could be. They did not explicitly draw upon this simple but helpful form of analysis in order to clarify what was happening, nor did they phrase most of their comments in ways which could be clearly related to the balance sheet format. The result was that the media provided the public with much information and comment but very little real understanding of these extraordinary financial events.

2. THE BALANCE SHEET APPROACH

Most balance sheets are presented as a single column, with Assets followed by Liabilities. Here it is more helpful to rearrange this presentation by simply moving the Liabilities into a second column to the right of Assets. We can then set out a simple and schematic bank balance sheet with just two kinds of assets and two kinds of liabilities:

<u>ASSETS</u>	<u>LIABILITIES</u>
EARNING ASSETS	DEPOSITS
LIQUID ASSETS	CAPITAL

Table A

DEPOSITS: this item is familiar to everyone; it is the money customers have paid into their accounts at the bank which therefore owes this money to them, making it a liability for the bank. It is important to note that included here are short-term inter-bank loans from other banks to this bank and hence this bank's liquid liabilities; to ensure that we are clear about which side of the balance sheet we are referring to we shall refer to these as inter-bank deposits (to distinguish them from inter-bank loans to other banks which will be found as liquid assets on the other side of the balance sheet). These inter-bank deposits are significant because they are often large and are much more sensitive to any signs of danger than ordinary customer's deposits.

CAPITAL: here this is equity capital derived from ordinary shares held by a wide range of investors who bear the risks and rewards of the bank's business. Bank capital appears on the balance sheet as a liability which the bank, as a separate legal entity, in some sense 'owes' to its shareholders.

EARNING ASSETS (also called RISK ASSETS): the bank does not just sit on all the money it has raised in the form of capital and from taking in deposits. Instead it lends out a high proportion of these funds as business loans or mortgage loans to creditworthy borrowers who will pay interest on these loans and repay the loans themselves on their due date. But a bank always has to allow for the risk that each year a small proportion of borrowers will be unable to pay the interest or to repay the loan; it allows for this in the interest rates it charges to borrowers. The bank will also acquire government stocks, corporate bonds and other marketable securities as earning assets.

LIQUID ASSETS: a bank must always be able to repay depositors who wish to withdraw their deposits or use them to make payments. To ensure this a bank holds liquid assets in some

proportion to its deposit liabilities. Although not the largest component of these liquid assets, the most important one for our purposes are deposits at the Bank of England here called BE reserve balances. Each bank decides its own target holding of these balances, subject to any official minimum requirement, and receives interest on them at Bank Rate. Just as ordinary bank deposits are the main means of payment between customers of banks, so BE reserve balances are the only means of payment/settlement between banks themselves. However most of these liquid assets will consist of Treasury bills, short-dated government bonds and short term inter-bank loans to other banks; these are liquid because they are very low risk, will mature into BE reserve balances over a short period of time or can be quickly sold and converted into these balances without significant loss, again emphasising BE reserve balances as the ultimate liquid asset for a bank

We now switch to abbreviations in this schematic balance sheet to keep it compact, and add some figures; the actual figures have swung widely over the years and particularly during the crisis so regard our figures here as just illustrative percentages:

<u>A</u>		<u>L</u>	
E	93	95	D
LIQ	7	5	CAP
<hr/>		<hr/>	
100		100	

Table B

Several things stand out in this bank balance sheet: first, EARNING ASSETS (E) are very large relative to CAPITAL (CAP). The reason for this is that earning assets (together with fees etc) provide most of the income for the bank from which it can pay interest on its deposits, meet all its other running costs, pay dividends to its shareholders, bonuses to its employees and retain the rest to support the growth of the business. Conversely, CAPITAL is kept at a proportionately low level relative to EARNING ASSETS (for present purposes this is its capital ratio, here just over 5 per cent) to enhance the bank's profitability, its level of profits per unit of capital. Similarly DEPOSITS (D) are very large relative to LIQUID ASSETS (LIQ). In its holding of LIQUID ASSETS a bank has to ensure that it always has sufficient liquidity to allow depositors to withdraw money or make payments from their accounts and balance this with the fact that such LIQUID ASSETS have lower yields than EARNING ASSETS. Experience in balancing these considerations results in a proportionately low level of LIQUID ASSETS relative to DEPOSITS (this is its liquidity ratio, here just over 7%).

We shall use this minimal schematic balance sheet to clarify and give structure to the dangers that banks have faced during Britain's banking crisis – different shocks and their consequences – and also the official actions which were taken to save them. Here we emphasise the impact effects of shocks because these are the destructive forces threatening banks with failure and we emphasise a

bank's liquidity and its capital because these are the potential failure points which have to be watched and where remedial action has to be focussed. Every effective system of bank supervision has to pay close attention to both of them.

Anyone with knowledge of banking could urge a multitude of perfectly valid reservations and elaborations to every aspect of this minimalist schematic balance sheet. Here we shall leave aside all such things in the belief that this balance sheet can be used to explain 95 % of the key events affecting British banks in the recent crisis. To maintain the immediate clarity and simplicity of this 95 % explanation, it is well worth leaving aside these many refinements which add only a final 5 %, do not invalidate the 95% explanation and later can be readily and clearly introduced into this balance sheet format.

There is one vital element that does not appear in our schematic balance sheet. For any bank to exist at all requires **confidence in counterparties**:

For depositors of all kinds this means confidence in their counterparty – the bank; that it will always be able to pay out their money if they wish to withdraw it or make payments with it. If they do not have this confidence depositors will not keep their money in that bank.

For the bank this means confidence in its counterparties – its borrowing customers, the issuers of bonds and similar marketable securities which it holds and the other banks to whom it has made inter-bank loans – that they will pay the interest on time and repay the loan on maturity.

Such confidence in counterparties, like some magnetic field of trust, suffuses and supports the whole financial system. When business is running normally such confidence in counterparties goes without saying; it is maintained by the prudence exercised in the normal course of business. When such prudence is allowed to lapse there can be serious shocks to the system leading confidence in counterparties to waver and collapse. Only then do we realise its vital, but normally invisible, importance for the banking system and for the economy as a whole.

3. BALANCE SHEET SHOCKS

A balance sheet must balance and this means that there can never be a change in a single item, but only in pairs of items; it is a **double entry system**. This becomes clear when we apply shocks to this bank's balance sheet, where a shock is a sudden adverse change which to the bank is unexpectedly large and potentially dangerous.

There are two primary shocks:

1. **Solvency shock** – factors forcing the write-down of a bank's earning assets (by – 4 in Table 1)
2. **Liquidity shock** – a fall in deposits due to withdrawals by depositors (by – 5 in Table 2).

Starting from the balance sheet figures in **Table B**, we look at the impact effects of these shocks, showing the original entry and the change, both in light type, and below these the resulting changed entry in bold:

1. Solvency shock: Earning assets have to be written down by – 4:

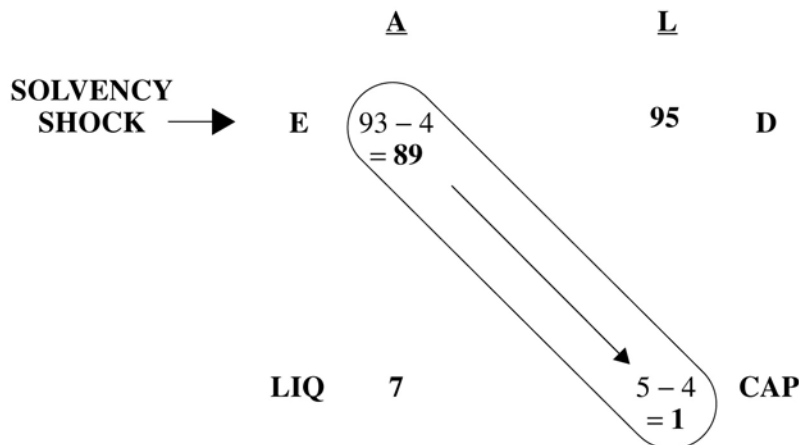


Table 1

In Table 1 a typical initiating event would be the actual default of some borrowing customers whose loans thus become worthless; or the sudden recognition that certain of the bank's earning assets have a significantly greater risk of default; or a fall in the value of a holding of marketable bonds. Any of these could force a write-down in the balance sheet value of the bank's earning assets, reducing this by 4 from 93 down to 89, a fall of just over 4%. On impact nothing has occurred to change Deposits or Liquid assets so that on the liabilities side Capital also has to be reduced by 4, from 5 down to 1, a potentially dangerous change for the bank. We place a ring showing the 'solvency link' between these two items and an arrow showing the direction of causation. Because the bank has only a fractional capital reserve, this equal fall of – 4 in these two items means that a given percentage fall in earning assets, just over 4%, is associated with a much larger percentage fall of 80% in the bank's capital and a similar fall in its capital ratio. We now omit the balance sheet totals, which are not necessary with our simple figures.

[Note that our capital ratio used here starts from the level of equity capital and relates it to the level of earning assets from which losses will emerge. This capital ratio is closely related to the concept of 'leverage' which relates equity capital to the level of total assets, not as a ratio r but as a multiple $1/r$. The official capital ratio relates core Tier 1 capital (virtually the same as equity capital) to the total of risk-weighted assets. This official capital ratio was subject to a minimum level required by the Basel II international accord. Following the banking crisis, this minimum is widely regarded as having been too low; it is in the process of being raised under Basel III].

This solvency shock is significant because:

(1) **Imminent insolvency is a crucial danger point for a bank.** If a bank's capital falls to zero, the bank is insolvent and by law it has to cease trading. The reasoning behind this is that if a bank's capital has disappeared, its trading risks will be borne by depositors who have not placed their money with the bank to bear such risks.

(2) **It is not easy for a bank to extricate itself from such a situation.** It can take time for it to rectify this sudden reduction in its capital by arranging a new issue of equity (if the market will provide the funds), and much longer if it tries to do this by cutting its dividends and staff bonuses, and ploughing back a greater part of its cash-flow profits into capital. For a small bank, being taken over by a larger and well-capitalised bank is often the only solution. Such a takeover adds together

the balance sheets, item by item, of the two banks concerned and often involves technical adjustments. The basic requirement for the combined bank is that it should have adequate capital and adequate liquidity and this, as we shall see later, is something the bank doing the takeover has to ensure through due diligence.

If a large bank cannot save itself from imminent insolvency in these ways, there are powerful reasons for government to intervene and save it. The failure of a large British bank, for whatever reason, would be very serious. Its affairs would immediately pass into the hands of the liquidators, small personal depositors would be safeguarded by deposit insurance and would lose control of their money for only a short period of time; but large private depositors, commercial depositors and (unsecured) inter-bank depositors would have their funds frozen for a significant period, possibly for years while the affairs of the failed bank were wound up, and then they might recover only a proportion of their money. Further, the liquidators of the failed bank would stop all new lending and begin to call in its loans; this could be disastrous for the borrowing customers who depend upon the bank for their financing. Such widespread damage to normal financing arrangements would be a terrible blow to businesses, causing some to fail and others to cut spending and reduce employment, threatening a wider, possibly cumulative, decline in business with more and more companies' forecasts and plans being dashed and confidence being severely shaken. These are powerful reasons for government to save a large bank which is in danger of insolvency; how it can do this we shall see later.

2. Liquidity shock: Deposits fall by – 5:

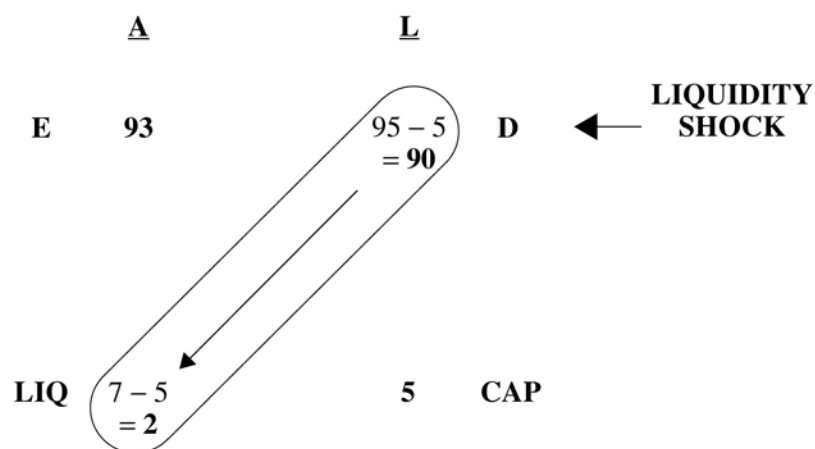


Table 2

Again starting from our original balance sheet entries in Table B, in Table 2 we focus upon a liquidity shock due to the sudden withdrawal of 5 of inter-bank deposits (which are sensitive and can move in relatively large amounts). This causes deposits on the liabilities side to fall by 5, from 95 down to 90, a fall of just over 5%. On the assets side, where the bank has only a fractional liquidity reserve, this causes liquid assets also to fall by 5, from 7 down to 2, a much larger percentage fall of 71%, and a potentially dangerous change for the bank. We place a ring showing the 'liquidity link' between these two items and an arrow showing the direction of causation. In normal circumstances, where there is full counterparty confidence, such liquidity shocks are unlikely to be very large and a bank can readily offset them by borrowing from other banks through the inter-bank market. In the broadest terms, money that has been withdrawn from one bank will have been paid into other banks who will then have these funds available to re-lend to the losing

bank, leading to offsetting changes of the same magnitude but with the opposite signs of those in Table 2. These inter-bank deposits – referred to as ‘wholesale funding’ for the borrowing bank – are normally fixed for a period of anything from 7 days to 3 months or longer and what we are looking at as withdrawals are really repayments on maturity. Instead of taking the money back, lenders will often ‘roll-over’ such maturing loans allowing them to run on for another period. In normal times these inter-bank deposits/loans were not secured by collateral placed in the hands of the bank making the inter-bank deposit. Note that here the bank simply aims to restore the level of its liquid assets; it would be more logical for it to aim to restore its liquidity ratio, but here and in comparable cases we keep to the simpler case of just restoring the level.

	<u>A</u>	<u>L</u>	
E	93 – 5 = 88	90	D
LIQ	2 + 5 = 7	5	CAP

Table 3

But there is another way in which a bank can restore its liquidity after such a shock. It can sell some of its marketable earning assets such as bonds or it can package some of its non-marketable earning assets such as mortgages into the marketable form of Residential Mortgage Backed Securities, RMBS (this is the process known as securitisation) and sell them. In the preceding Table 2 the liquidity shock had reduced the bank’s liquid assets to 2. Table 3 shows a bank in normal circumstances offsetting this fall by selling 5 of these securitised earning assets which will be paid for in BE reserve balances, restoring its liquid assets to their pre-shock level of 7. We place a ring linking this pair of entries. Such sales by a single bank with its own minor liquidity problem, and in normal circumstances, can be readily absorbed by the market with little effect on prices.

Some banks used this method of securitising mortgages into RMBS and selling them as a standard way of strategically managing their liquidity and mortgage business. Starting from the restored position with 7 of liquid assets as in Table 3, new mortgage lending of 5 would produce changes of the same magnitude as shown there but with opposite causation and opposite signs: earning assets would rise by 5 and liquid assets would fall by 5; liquidity would then be restored again by the next tranche of the securitisation and sale process already explained, with the same signs as in Table 3. Such a cycle of reversals of the signs in Table 3 reflected the business model of some banks.

What would happen if circumstances were not normal and for some reason the inter-bank market or the market in RMBS could not or would not allow a bank to acquire the liquid assets it desperately needed to avoid fatal illiquidity. When a bank’s liquid assets are finally exhausted the bank can no longer make payments which are due to other banks and depositors can no longer use the funds in their accounts; then the bank has failed and it has to close its doors and cease trading. A firm of liquidators would then take over and start dismantling its business and its balance sheet. **Imminent exhaustion of its liquid assets is another crucial danger point for a bank.** Again, there is a

powerful case for intervention to prevent such failure of a large bank with its potential cost to the economy and later we shall see how this can be done by the Bank of England.

Looking back now at Tables 1 and 2, the rings linking the different pairs of entries show that on impact these two shocks – to solvency and to liquidity – have entirely different and independent effects on a bank's balance sheet. Further, they are quite different kinds of shock: the liquidity shock is a transaction shock while the solvency shock is a valuation shock.

It has been noted above that dangerous liquidity shocks are most unusual in normal times and when such shocks do occur one can expect them to be in response to some preceding solvency shock somewhere in the system which has already eroded confidence in counterparties. This means that rebuilding liquidity by the usual methods set out above cannot be relied upon. The movement towards a banking crisis can be seen as involving these two shocks in the following way:

3. Solvency shock leading to a liquidity shock

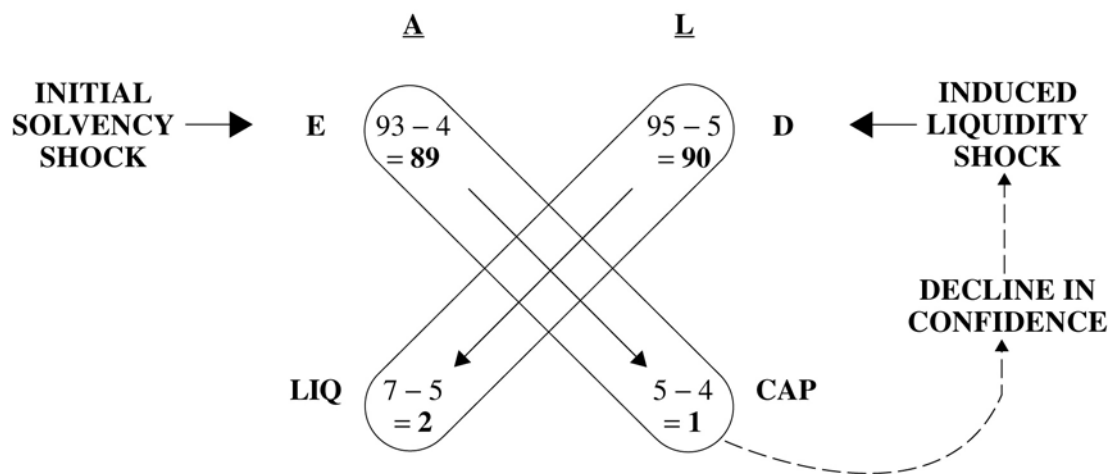


Table 4

In Table 4 we look at events in two stages. In stage 1 the initiating factor for this particular bank is a solvency shock (as illustrated earlier in Table 1). Such a shock arose from a sudden deterioration in the value of this bank's earning assets, forcing a write-down of -4 in their balance sheet value. This causes an equal reduction in its capital and a much greater percentage fall in its capital ratio. This dangerous impact shakes the confidence of inter-bank depositors in this bank (shown by the dashed arrow), leading them to start withdrawing their deposits and inducing a liquidity shock to the bank (of the kind illustrated earlier in Table 2).

In stage 2 both such shocks affecting one bank will quickly become known across the market, arousing fears that comparable banks may be facing similar solvency and/or liquidity shocks thus inducing inter-bank depositors to begin withdrawing their funds from those banks also. In this way fears of solvency shocks to come and actual induced liquidity shocks, showing falling confidence in counterparties, spread across the system. In the extreme case this leads retail depositors to fear for the safety of their deposits and leads to a 'run on the bank' as they try to withdraw their money before the bank finally closes its doors and goes out of business. With every bank losing confidence in the solvency and liquidity of every other bank it quickly becomes difficult and then impossible for banks to restore their liquidity by borrowing in the inter-bank market or by selling marketable assets because fears will also close down those markets. The stock market will become aware of

these problems at an early stage and the price of shares in all the affected banks will fall giving further impetus to declining confidence.

The interconnection between solvency shocks and liquidity shocks was a leading feature of the recent banking crisis, but while illiquidity is typically the more urgent threat to a bank, insolvency is the more fundamental but also the more problematic. Some of a bank's earning assets are marketable and can be 'marked to market' – valued at current market prices. However a large part of them are loans to customers which cannot be marked to market and instead their value has to be estimated. When the quality of either of these classes of assets has deteriorated, or is thought to have deteriorated, these valuations can become very insecure, because:

(1) for marketable assets, market turnover can contract so that there is no deep and active two-way market generating continuous prices but rather a few desperate negotiated deals and no effective market price to mark to. There is then the danger that a bank will mark to such a 'fire-sale' price and in this way drive down the value of its own assets, unnecessarily weakening its own solvency, instead of recognising that with no market price the only alternative is to use values estimated in some way.

(2) the value of non-marketable assets becomes even harder to estimate because the creditworthiness of customers becomes more uncertain.

For these reasons it can become difficult to establish a bank's solvency position with any precision at any given time. This can lead to solvency shocks which are lagged and cumulative because it can take time for the full scale of forced write-downs to emerge onto a bank's balance sheet and to become publicly known. But a bank's liquidity position is much more clear-cut: it must be able to make all its due payments day by day and imminent inability to do this is a clear signal for immediate action if a bank is to be saved from failure. This leads us to the role of BE reserve balances which are the vital element in a bank's liquid assets because all transactions between the customers of different banks lead to settlement between the banks themselves through the transfer of these balances as illustrated in tables 5a, 5b and 6a, 6b below:

<u>Paying Bank</u>			<u>Receiving Bank</u>		
	<u>A</u>	<u>L</u>		<u>A</u>	<u>L</u>
BE reserve balances	- x	- x	BE reserve balances	+ x	+ x
		Dep (in P's name)			Dep (in R's name)
Table 5a			Table 5b		

In Tables 5a and 5b the customer P at one bank (which we call the paying bank) pays an amount x to R who has his account at another bank (the receiving bank). In effect, the paying bank deducts a slice of assets and liabilities across its balance sheet, consisting of BE reserve balances and the deposit of P, the payer, each of magnitude x. These are then passed over and added to the balance sheet of the receiving bank with the deposit now in the name of R, the receiving customer.

<u>Paying Bank</u>			<u>Receiving Bank</u>		
	<u>A</u>	<u>L</u>		<u>A</u>	<u>L</u>
BE reserve balances	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;"> $-x$ $-x$ </div>		Inter-bank Dep	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;"> $-x$ </div>	
			BE reserve balances	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;"> $+x$ </div>	

Table 6a
Table 6b

In Tables 6a and 6b we have the case which is more significant for us here, the withdrawal/maturing of an inter-bank deposit. As before, the paying bank deducts a slice across its balance sheet consisting of BE reserve balances and the withdrawer's inter-bank deposit, each of magnitude x . However in the balance sheet of the receiving bank both items appear on the assets side where the bank now has $-x$ of inter-bank deposits (which it has withdrawn) and $+x$ of BE reserve balances which it has received in payment.

When banks begin to fear abnormally high withdrawals of inter-bank or other deposits, levels of BE reserve balances which were sufficient in normal times suddenly appear inadequate and the demand for them rises and begins to exceed the current supply. Individual banks may struggle hard, but this can only push up interest rates and the cost of inter-bank borrowing, doing no more than changing the distribution of the available supply of BE reserve balances. Soon some banks become so short of BE reserve balances that they face imminent fatal illiquidity. What can then be done to save them, and the banking system, is explained below.

4. SAVING THE BANKS

As the recent banking crisis developed, some British banks faced growing liquidity and solvency dangers. The damaging consequences which would follow from their failure led the government, the Bank of England and the Financial Services Authority (the Tripartite Group) to decide that large banks facing failure had to be saved. We now look at the ways in which this was accomplished, starting from the post-shock balance sheet magnitudes in Table 4.

Liquidity problems were the first to hit most British banks in the recent crisis. The Bank of England always has the power to solve a bank's liquidity problem by acting in its traditional role as lender of last resort (provider of what is now more often referred to as Emergency Liquidity Assistance – ELA). It does this by lending the bank liquid assets in the form of BE reserve balances against the security/collateral of the borrowing bank's non-liquid assets. Increasingly this is done in the form of a 'repo' (short for 'sale and repurchase agreement') in which a bank wishing to borrow a certain sum for, say, 7 days enters into a repo agreement with the Bank of England by which it sells to the Bank non-liquid assets of this value, agreeing to repurchase them at the end of the seven days. This provides the borrower with the seven day money he requires, with the precise terms of these two sale/purchase operations providing the agreed rate of interest on the seven-day loan. One advantage of this repo system is that the lender has purchased the securities and has full legal title to them. Should the borrower fail to repurchase them at the end of seven days these assets are under the full control of the lender, to be disposed of as suits him best. This repo process is illustrated in Tables 7 and 8.

A lender of last resort operation could also be done by the Bank simply making a seven-day loan to the borrower and taking an appropriate lien upon borrowing bank's assets as security (a method the Bank has used in the past). In this case the Bank of England's balance sheet in Table 7 would show only one difference – on the assets side a loan of + 5 to the borrowing bank. In Table 8, the earning assets of the borrowing bank would be unchanged at 89 but its deposits would rise by + 5, the amount now owed to the Bank; in all, this would amount to the reverse of a liquidity shock (Table 2). If the borrower did not repay the loan the Bank could exercise its lien upon the borrower's assets, but it could face problems of delay and competing claimants. These are avoided with repos.

Bank of England	
<u>A</u>	<u>L</u>
Earning Asset mortgage Collat- eral from bank	+ 5
Treasury bills	- 5
Treasury bills	+ 5
	+ 5
	BE reserve balances

Table 9

Bank	
<u>A</u>	<u>L</u>
E	89 - 5 = 84
LIQ	2 + 5 = 7
	90
	D
	1
	CAP

Table 10

The Bank of England also developed a different way of assisting a bank's liquidity, the Special Liquidity Scheme (SLS). Under this, for one year initially, it lent to a bank not BE reserve balances but Treasury bills. The Treasury bills came from the government's Debt Management Office and, as illustrated in the lower ring of Table 9, the Bank of England paid for them by creating 5 of new BE reserve balances in the name of the government. In stage 2, shown in the upper ring in Table 9, the Bank of England swapped these Treasury bills (- 5) for high quality mortgage backed and other securities (+ 5) as collateral from that bank's earning assets. These last two changes are mirrored in the borrowing bank by the ringed changes in Table 10. The effect on the balance sheet of a bank borrowing Treasury bills in Table 10 is the same as that of borrowing BE reserve balances from the Bank of England as lender of last resort in Table 8. This is because the two do not distinguish between BE reserve balances and Treasury bills as constituents of the bank's liquid assets. Indeed, functionally there is no significant difference between them because the borrowing bank could sell these Treasury bills in the market or use them as collateral for borrowing from other banks both of which would be settled in BE reserve balances. Either of the operations in Tables 8 and 10 would increase the amount of highest quality liquid assets in the system but the related Tables 7 and 9 respectively show the different effects on the Bank of England's balance sheet. The government also introduced a Credit Guarantee Scheme (CGS) which could help a bank to increase its liquidity, and this is dealt with in the fourth paragraph of the comments following Table 12 below.

Solvency problems. In the typical crisis situation illustrated earlier in Table 4, the bank faces both a liquidity and a solvency problem, its liquid assets and capital having both fallen to the dangerously low levels of 2 and 1 respectively. Only the Government can provide help on the scale required to save a large bank faced with insolvency. It does this in two stages:

The diagram illustrates the balance sheet of the Bank of England (BE) and the Bank of Ireland (BANK) after a government provision of new equity capital.

Bank of England (BE):

- Assets (A):** Government debt (+4)
- Liabilities (L):** BE reserve balances (+4)

Bank (BANK):

- Assets (A):** LIQ (2 + 4 = 6)
- Liabilities (L):** CAP (1 + 4 = 5)

An arrow points from the text "Government provision of new equity capital" to the CAP liability of the Bank, indicating the source of the new equity capital.

Table 11

Table 12

First, in Table 11, it creates new government debt of the desired amount, + 4 in our example, and sells it to the Bank of England which pays for it by creating + 4 of new BE reserve balances in the name of the Government. (This is the process by which government nowadays can create money.)

In Table 12 the Government then buys + 4 of newly created ordinary shares (equity) from the bank it is saving, handing over the + 4 of newly created BE reserve balances in payment, raising the bank's capital by + 4, back to its previously desired level of 5. This also raises the bank's liquid assets by + 4, taking them to 6. This is still below their previously desired level of 7, leaving the bank to restore this level by other means, such as borrowing 1 from the Bank of England as lender of last resort (since this bank is now solvent and assuming that other markets are effectively closed in these circumstances.). This government action has saved the bank from imminent failure. Note that when the government 'hands over' these BE reserve balances in payment, these balances remain in the Bank of England; it is just their ownership which is transferred from the government to the bank receiving them in payment for the new shares it has sold to the government.

As the crisis developed one or two banks were able to raise new equity capital by making a rights issue to their existing shareholders. Such a new issue would be recorded by the same entries as the purchasing of new equity capital by the government (Table 12) (which in this way itself becomes a shareholder) and would have the same effects of raising equity capital and liquidity. However, see the comments on such a case in the two paragraphs following Table 14 below.

As a further means of helping banks with their liquidity the government set up the Credit Guarantee Scheme (CGS). In the circumstances of the crisis it would not have been possible for most banks to sell new debt or equity to investors to bring in further liquidity. The CGS provided a government guarantee for new issues of senior debt (short-dated, often three year, bonds or commercial paper), allowing banks to sell these in large amounts to investors. It might seem that a new issue of such debt, could be recorded in our schematic balance sheet as a rise in capital with the same entries as the (government) provision of new capital (Table 12), bringing in liquidity in the same way. But

there is the vital difference that this rise is in a bank's debt capital, not in risk-bearing equity capital. Such debt capital cannot just be written off if there is a fall in the value of earning assets and it does not add to a bank's defence against insolvency. It is more in the nature of a longer fixed-term deposits which could not be withdrawn at short notice and in our minimal balance sheet it could therefore be reasonably included as a longer term component of deposit liabilities. Treated in this way such an issue of new debt by a bank would be recorded as a reverse liquidity shock (Table 2 with the signs reversed), raising liquidity but not affecting equity capital.

A new form of bank capital which has been proposed is the Contingent Convertible bond. This begins life as a debt liability which cannot be written off against a fall in the value of earning assets. However, in specified circumstances (such as the issuing bank's official capital ratio falling below a particular level) it can be converted into equity capital which can be so written off and therefore is an additional defence against insolvency. The terms for such a bond would have to reflect this risk to the bond holders of conversion/write-off which could make it expensive for the issuing bank. While its conversion would certainly increase a bank's equity capital there are differences of opinion as to whether such conversion would be regarded as a sign of strength or of weakness for the bank concerned. As above, the issue of such a bond could be treated like an inflow of long-term deposits, raising liquid assets by the same amount and recorded as a reverse liquidity shock (Table 2 with the signs of the changes reversed). The conversion of such a bond would then be recorded by the same entries as in Table 14 below in which there is a sale of new equity to the bank's own depositors. In both cases there is a conversion of deposits/non-equity capital into equity capital. This would have no effect upon the bank's liquid assets and no effect upon its liquidity ratio since such bond components would not have been included as deposit liabilities in its calculation.

5. MORE ON BALANCE SHEETS

Earlier Table 3 illustrated a bank selling marketable assets to bring in liquidity in the form of BE reserve balances. However domestic banking in Britain is dominated by four large banks. If we consider a large bank which accounts for, say, 20% of the system, then in some of a bank's own

<u>Bank</u>			
<u>A</u>		<u>L</u>	
E	$\begin{array}{r} 89 - 2 \\ = 87 \end{array}$	$\begin{array}{r} 90 - 2 \\ = 88 \end{array}$	D
LIQ	2	1	CAP

Table 13

transactions, a proportion of these will be done with its own depositors. Suppose such a bank sells 10 of marketable assets, aiming to bring in BE reserve balances to raise its liquid assets. We could expect some 20% of these sales, amounting to 2, to be to the bank's own depositors. Table 13 shows (in the ring) just this intra-bank element of - 2 in such earning asset sales which reduce

deposits by -2 instead of bringing in 2 of liquid assets. By reducing deposits it raises the bank's liquidity ratio but only by a tiny amount compared with sales to outside depositors shown in Table 3 which bring in the full amount of liquid assets.

<u>Bank</u>			
	<u>A</u>		<u>L</u>
E	89		D
			$90 - 2$ $= 88$
LIQ	2		CAP
			$1 + 2$ $= 3$

Table 14

Similarly with a bank making a rights issue of 10 of new equity. Table 14 shows (in the ring) just the intra-bank element in this transaction where 2 of this equity is sold to the bank's own depositors (implicitly assuming that for any bank there is no particular link between being a shareholder and being a depositor). This raises equity capital by $+2$, the same as sales to outside depositors, and raises the bank's capital ratio accordingly; but it reduces deposits by -2 as customers pay for them, instead of bringing in $+2$ of liquid assets as would occur with sales to outside depositors. This will slightly improve the bank's liquidity ratio but only by a tiny amount compared with sales of new equity to outside depositors. This latter case has already been seen in Table 12 where the entries record such a sale of newly issued shares to an outside depositor – in that case the government, whose account is with the Bank of England – which does bring in the full amount of liquid assets.

All these 'large bank' cases have assumed that these transactions are confined to the domestic market. However a bank which is large domestically will be relatively much smaller in the international banking system and such types of transaction are likely to be conducted in a market wider than the purely domestic one. Such 'large bank' effects seem unlikely to be very important in most cases and accordingly they are ignored elsewhere in this paper.

Looking at customer transactions, Tables 5 and 5a showed the case where these are between customers of different banks with such economic activity leading to deposit and BE reserve balance entry pairs being transferred between banks; but where transactions are between two customers of the same bank then deposits alone are transferred from the account of one customer to the account of another and there is no transfer of reserve balances. The situation is the same in the limiting case of a closed and aggregated banking sector; there can be no transfer of reserve balances and it is then convenient to notionally hold all bank deposits stationary with transactions showing up as turnover in the ownership names attached to these deposits. Another aspect of such an aggregated banking sector is that while it cannot increase its holding of central bank balances without the cooperation of the central bank, it can increase its equity capital endogenously to the extent that it can persuade depositors to use their deposits to buy such newly issued equity, as illustrated in Table 14. This does not raise the level of central bank balances but by reducing deposits it will slightly raise the liquidity ratio.

Looking at our schematic balance sheet in a more abstract way, it contains just two items of liabilities and two of assets, four items in all. There are only six ways in which it can accommodate

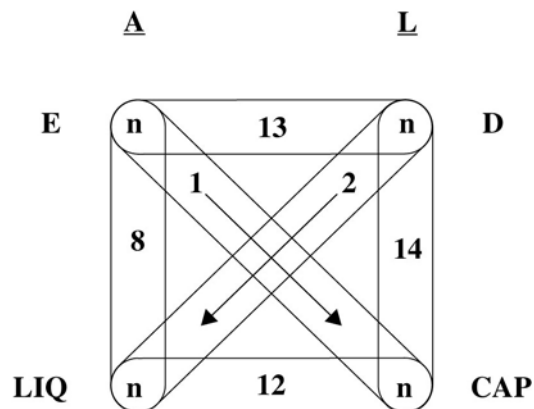


Table 15

different pairs of entries, which means that it can record only six different patterns of such balance sheet changes. All of these have been illustrated in earlier tables and they are set out together in Table 15 with each possible pair of entries linked by a ring which contains the number of the table in which that change has been illustrated. These balance sheet changes/events are listed in Table 16.

<u>Table</u>	<u>Event</u>
1	Solvency shock
2	Liquidity shock
8	Liquidity increase provided by lender of last resort
12	Capital increase provided by government
13	Sale of earning assets to a bank's own depositors
14	Capital increase from take-up of rights by own depositors

Table 16

As we have already seen, in our minimalist schematic balance sheet a particular pair of entries can arise from distinctly different banking operations and motivations but the effects upon a bank's liquid assets and/or equity capital will be the same in each case. For example, the sale of earning assets to outside depositors (Table 3) will be recorded by the same pattern of entry changes as repo borrowing from the lender of last resort (Table 8), and both will raise a bank's liquid assets. Similarly a rights issue taken up by outside depositors will be recorded by the same pair of entries as an emergency provision of capital by the government (both covered by Table 12) and both will raise a bank's equity capital and liquid assets. It is a strength of this minimal schematic balance sheet that in separating out and emphasising liquid assets and equity capital it makes all transactions/revaluations reveal their effects upon these two key elements in a bank's balance sheet.

So far we have not considered the effects of profits (a flow) on a bank's balance sheet (a stock). A bank can have annual profits or losses (all post-tax in what follows) of two kinds: (1) trading or cash-flow profits arising from transactions and (2) valuation changes such as the losses from the

solvency shocks looked at earlier. Trading profits, assumed here to be positive, and accruing evenly over time, can be helpfully regarded as flowing straight into capital and liquid assets in the balance sheet, with dividends on equity and staff bonuses flowing straight out of these, leaving increased capital and liquid assets from retained profits. These retained flows will help to repair any reduction in capital or in liquid assets arising from solvency or liquidity shocks, but they will do so relatively slowly over time. They are of little help when imminent danger requires immediate and large-scale action.

Looking in this way just at capital, a simple schematic time series of accruals from cash-flow profits over one year for a bank with annual trading profits of 100% would consist of segments of linear growth punctuated by downward steps as the bank pays out, for example, dividends of 10% at the end of Q1 and 30% at the end of Q3, and bonuses of 20% at the end of Q4, leaving 40% of profits retained as capital in the business. This is illustrated in Table 17:

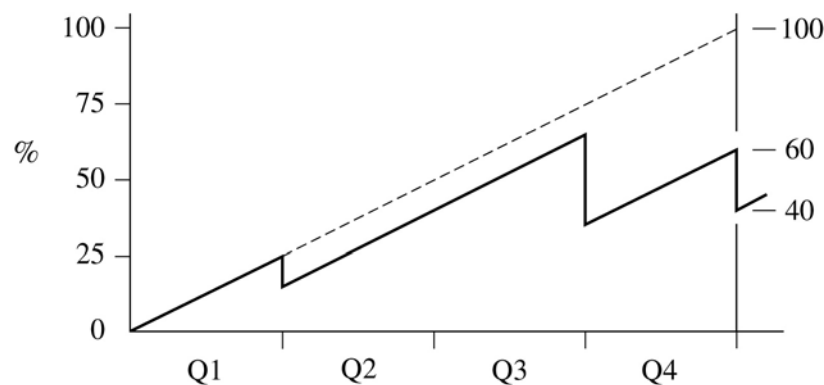


Table 17

Normal accounting practice would add valuation profits or losses to these trading profits to produce total profits. Looking here just at losses from forced write-downs in the value of earning assets, loss of income can be expected to accompany these write-downs which will reduce the growth of transaction profits and the growth of capital from the retained element. However this effect on total post-tax profits will be small compared with the effect of adding in the valuation losses themselves. An even more schematic view of capital over a longer period would then consist of a fairly steadily growing sawtooth pattern of retained transaction profits modified by any losses from valuation shocks or gains from revaluations/writebacks.

Looking at bank cash-flow profits in this way shows why during the recent crisis the government stopped dividends and tried to reduce bonus payments by the banks it had rescued; this was in order to bolster their capital and liquid assets. It can also help to explain the paradox of apparent banking prosperity amidst banking near-disaster by recognising that a bank which has managed to survive severe but transient solvency shocks, with total profits temporarily collapsing into losses, can still feel it necessary to pay out handsome bonuses. This is because certain of its current banking operations and the trading profits from them are still buoyant, and the identifiable generators of these profits feel that they deserve some recognition of their positive financial contribution amongst so much failure and loss. Whether the scale of such bonuses is justifiable is another matter, usually answered by the fact that if one bank doesn't pay them such profit generators will move to a bank which does. This puts the problem back to banks in general where at present there appears to be no sign of any agreement which might set a common acceptable limit to the total bonus pool for every

bank. However there has been successful pressure to change the structure of bonuses, reducing the immediate cash component and increasing the deferred/invested component.

* * *

Having used our minimal schematic balance sheet in a range of examples, it is instructive to re-read the second paragraph in the Introduction:

Our use of the balance sheet approach makes it clear that this framework imposes a fruitful discipline on the description and discussion of the events of the banking crisis and indeed of banking operations in general. For any balance sheet item, it requires us to be clear about which side of the balance sheet it is on: when talking about reserves, are these capital reserves on the liabilities side? or liquidity reserves on the assets side? And when talking about a change in a balance sheet item, it requires us to remember that entry changes must occur in pairs – where on the balance sheet is the related entry? and what is its significance? Our schematic minimal balance sheet emphasises a bank's capital and liquid assets because in a system open to shocks these are the potentially fragile points of a bank at which failure can occur and remedial action has to be focussed. It can help us to answer confusing questions: will a shock write-down of earning assets reduce a bank's liquidity? (after all, both these items are on the assets side of the balance sheet) and if a bank suffers a shock withdrawal of deposits will this reduce its capital? Exactly how might a bank arrive at the brink of failure? and if a bank has been bailed out, has it been provided with additional liquidity? or additional capital? or both? and by whom? and how? [The answer to both the confusing questions posed above is: No, as will be seen from Tables 1 and 2 respectively.]

6. BRITAIN'S BANKING CRISIS: ORIGINS AND IMPACTS

There have been many efforts to trace the deeper origins of the banking crisis which hit the western financial system and here we mention some of their conclusions. We then look at the emergence of the banking crisis in Britain and its main events, linking these where appropriate to the patterns of balance sheet changes in the examples set out above, and in this way emphasising the use of the balance sheet approach.

In recent years China has had a massive trade surplus, much of it earned by exports to the USA, which created very large dollar assets partly held in US banks. This growing holding of dollars was lent to the market and this together with the terrible event of the twin towers and fears for its effects on the US economy led to a period of unusually low interest rates in the USA. Public policy to increase home ownership by those on low incomes, accompanied by high-pressured and irresponsible selling of mortgages, led to a housing boom. But many low income borrowers did not understand the mortgage liabilities they had taken on (often at low 'teaser' rates) and later found that, faced with higher interest rates, they could not keep up their mortgage payments. This led to growing repossessions and resale of these houses by the lenders, ending the boom, causing a downturn in house prices and revealing that a significant proportion mortgage loans were of sub-prime quality and now of doubtful value. This marked the starting point of the sub-prime problem.

US banks had pioneered a new banking technique of 'originate/securitize/sell-on' in which the banks and others made mortgage loans, and banks then packaged these assets into the form of marketable securities aiming to sell them on in large amounts to banks and other institutional investors world-wide thereby spreading the risk. These securities are often referred to as Collateralised Debt Obligations (CDOs), a convenient general term which can sometimes be used to

include such things as Residential Mortgage Backed Securities (RMBS) seen earlier in a British context as well as Asset Backed Securities (ABS) to be seen below. In the event, the greater part of these CDOs remained somewhere in the western banking system, thereby concentrating rather than spreading the risk. In March 2007 and again in August some banks reported finding that their CDO holdings contained an unknown but worrying proportion of sub-prime mortgages of doubtful value. These (and similar doubtful mortgages held directly by banks) became known as toxic assets and the banks holding them had to successively write them down as their loss of value became increasingly evident, creating solvency shocks (Table 1). Concern about toxic assets spread.

At the same time Britain was having its own mortgage-driven housing boom, helped by easy money from US banks being lent to British mortgage lenders. This allowed the latter to have an abnormally high proportion of potentially volatile inter-bank deposits rather than relying upon the more stable retail deposits as had been the case in the past. House prices were driven far above any conventional valuations and here, as in the USA, there was unsound mortgage lending by some banks (125% of house value, on up to six times income or on self-certified income). In Britain the housing boom was accompanied by a less obvious, but possibly more damaging, commercial property lending boom in which HBOS was prominent; both of these created home-grown toxic assets. The Treasury, the Bank of England and the Financial Services Authority (FSA) formed the Tripartite system for the light touch banking regulation introduced by Gordon Brown. The Bank of England noted the housing boom but evidently regarded it as being outside its remit; it had concerns but was reluctant to voice them when the market had become so fragile (simply indicating that it missed the opportunity to speak out earlier when the market was still robust). The FSA said and did nothing effective. This left it to the Treasury, which either did not notice it or felt that nothing need be done to curb it; perhaps it too believed in 'rational markets' – that the market knows best.

Any such belief is clearly misplaced; markets are neutral, simply reflecting the views and judgments which lead transactors to buy or sell, to borrow or lend. If those transactors are not rational but suffer from delusions – that the property market will go on rising for ever – then their transactions will inject these delusions into market prices; these in turn infect others with the same delusions, leading to the cumulative divorce from reality which converts a boom into a bubble. Sooner or later enough people will begin to see through these delusions and this will burst the bubble; property prices then collapse and many decisions taken under such delusions then prove to be damagingly expensive and even ruinous mistakes. But the true believers, whose minds are in thrall to the idea of rational markets, are led to interpret such developing bubbles as reflecting deep and significant rational forces at work which our normal analysis is missing. They urge that such forces should be allowed to develop and that all we can do is dig deeper to where these forces can be uncovered and properly understood as the working of a rational market. This occurred with the Japanese stock market boom/bubble of the late 1980s where some rational market believers insisted that the market was reflecting something fundamental and rational which we were failing to understand. The irrational urge of Japanese companies to purchase each other's shares together with the delusions and herd instinct of Japanese housewives, who were said to have been responsible for much of Japan's stock market investment, seem to be more convincing explanations. However, by any standard the British housing market broke free of conventional valuations to an extreme degree and it is hard to understand how this housing bubble was allowed to develop, with everyone being aware of it but no one having the responsibility or policy tools to even attempt to curb it.

Toxic assets now began to cause cumulating solvency shocks (Table 1) affecting many banks in the USA, in Britain and on the continent, driving their capital and their capital ratios dangerously downwards. But it took time for the scale and wide distribution of toxic assets to be fully recognised, their write-downs to be incorporated into balance sheets and for the figures to appear in the market. Meanwhile growing fears and suspicions had already begun to weaken confidence in

counterparties, inducing liquidity shocks (Table 4) as US banks, in particular, began to withdraw their inter-bank deposits from British banks which they no longer fully trusted. In this way it was induced liquidity shocks which marked the onset of the crisis for most British banks with these same shocks spreading across much of the western banking system. In Britain this led to a desperate search for funds to repay/replace these withdrawals, which pushed inter-bank interest rates (as indicated by LIBOR, the London Interbank Offered Rate) well above their normal levels. The few remaining lenders shortened the term of their inter-bank deposits as some defence against future uncertainties. In this way inter-bank borrowing to replace withdrawn funds became more difficult and finally became impossible as the inter-bank market ceased to operate because lack of confidence in counterparties meant that there were no lenders. This left the banks with no option but to turn to the Bank of England and the government to provide the very large amount of liquid assets, particularly BE reserve balances, that they needed and no option for the Bank and the government but to provide them in order to save the system from failure. This was done through three channels: (a) The Bank of England providing BE reserve balances as conventional lender of last resort using repos (Tables 7 and 8). (b) through the Bank's Special Liquidity Scheme (SLS, see Tables 9 and 10 and the following paragraph) and (c) through the Government's Credit Guarantee Scheme (CGS, see Table 12 and the fourth paragraph following it). Many of these operations were not made public at the time, but we now know that they were on a very large scale with estimates of up to £500bn of lending through the SLS and CGS outstanding early in 2010 when the crisis had calmed down. The two schemes providing these loans are due to close down over the years 2012 – 14, raising the uncomfortable question of where banks will be able to borrow the very large amount of money to repay/replace these loans as they are withdrawn.

During the crisis some smaller building societies were saved by being taken over by larger institutions and a government guarantee shielded British depositors from the major failure of Icelandic banks. But here we shall look just at the larger British banks which were seriously affected by solvency and liquidity shocks. There is still much that we do not know about the exact situation in these banks as they faced imminent failure, and although additional information is slowly emerging it is likely to be a long time before we know the detailed picture. Such is the interplay between the dangers of approaching insolvency and illiquidity in such a tense situation that even then it may be difficult to distinguish just how much each of these contributed in taking a bank to the brink of failure (see the two paragraphs before Tables 5a and 5b above).

However, the official action to rescue banks can give us some pointers. The Bank of England acting as lender of last resort (Tables 7 and 8) and through the SLS mentioned above (Tables 9 and 10) would normally help a bank with liquidity problems if it were viable in other respects – which primarily means that it had adequate capital and was therefore solvent. On the other hand only government has the financial strength to provide new capital to save a large bank from insolvency. When this is done by buying newly created shares in a bank it increases that bank's liquid assets by the same amount (Tables 11 and 12), but such action would hardly be taken if it were purely a liquidity problem – that would be left to the Bank of England. With these distinctions in mind, but remembering from Table 4 that solvency and liquidity problems are likely to be closely intertwined, we look briefly at the British banks that were saved from failure during the crisis.

Northern Rock Earlier in 2007 difficulties in money markets had forced a number of banks to borrow from the Bank of England in its normal role as lender of last resort (Tables 7 and 8) but the first British bank to suffer a large liquidity shock was Northern Rock, Britain's fifth largest mortgage lender. To fund rapid growth its business model required regular securitisation and sale of new mortgages (see the second paragraph after Table 3) and a reliance on heavy borrowing from other banks in the form of inter-bank deposits, making it particularly vulnerable to the liquidity shock of withdrawals as confidence in counterparties declined. In September 2007 Northern Rock

suffered such a liquidity shock (Table 2) which forced it to turn to the Bank of England as lender of last resort for help in restoring its liquidity (Tables 7 and 8). When Northern Rock announced on 13 September that it had asked for and received such help this triggered a run on the bank as retail depositors began to fear that Northern Rock was about to collapse and queued up to withdraw their deposits before this happened. In the media this hit the headlines and was described as the first such run on a British bank since Victorian times. It occurred despite the fact that these deposits up to £35,000 were largely, but not fully, insured through the Financial Services Compensation Scheme. However the government feared that the run on Northern Rock might spread to other banks and to stop this happening it quickly guaranteed all deposits with the bank. Shortly afterwards it raised the level of full deposit insurance for retail deposits up to £50,000 for all British banks.

In the following months efforts to find another bank to take over Northern Rock were unsuccessful. The government became increasingly doubtful about its prospects, concerned about the dangers from Northern Rock's arrangements with its large off-balance-sheet securitisation vehicle called Granite (note the play on words). Seeing the need to safeguard the large amount of public money committed to the bank (over £50bn, in deposit guarantees by the Treasury and in loans from the Bank of England) the government took it into temporary public ownership on 22 February 2008. This was done under new powers allowing compulsory acquisition of all its existing shares (the Banking (Special Provisions) Act, 2008), with the Chancellor stating that Northern Rock at that time was solvent and its mortgage book was of good quality. The price of shares in Northern Rock had by now drastically declined. A value for the shares at the time when they were taken over was to be determined later and in due course, to the anger of shareholders, they were estimated to have had zero value. This implied that at the time Northern Rock was taken into public ownership all its capital had in fact been lost by solvency shocks from toxic assets (Table 1). For this reason, on taking it over the Treasury at the same time bought £26bn of ordinary shares newly created by Northern Rock providing it with this amount of new capital and new liquid assets, the latter in the form of BE reserve balances (Tables 11 and 12). At this point it would appear that the Bank of England received repayment of the loans it had made to Northern Rock as lender of last resort in September 2007 (Tables 7 and 8 with the signs of the changes reversed). In this way Northern Rock was first rescued from fatal illiquidity by the Bank of England as lender of last resort and then taken over by the government to save it from insolvency. We shall not pursue the later history of Northern Rock under government ownership.

Lehman Brothers At this point we look across the Atlantic to what was the most significant single event of the world banking crisis: on 15 September 2008 Lehman Brothers, the large and high-profile US investment bank, heavy with toxic assets, filed for bankruptcy. Despite pleas from Wall Street the US authorities did not see the financial damage this would cause and did not act to save it. Just two days later they provided a much larger financial package to save the insurer AIG which was deeply involved in Credit Default Swaps and was deemed to be too large and too strategically important to be allowed to fail. Much is still unclear but it seems that Lehman's main source of inter-bank loans, J.P. Morgan, was asking for more collateral which Lehman could not provide, implying insolvency, and it was therefore faced with the withdrawal of these loans which it could not repay, implying fatal induced illiquidity. If a bank as important as Lehman could fail, then could any bank be safe? There was a widespread and precipitous fall in confidence in bank counterparties across the western world, inter-bank rates rose sharply as banks strove to meet their liquidity needs in an inter-bank market which had virtually closed down because there were no lenders.

In Britain these fears led to a surge in demand for the safest liquid asset – BE reserve balances. The Bank of England was able to meet this demand because it had already extended the scope of its lender of last resort repo operations (Tables 7 and 8) both in scale and in the range of assets it would accept. There was also the Special Liquidity Scheme providing Treasury bills, which were liquid

assets, in exchange for earning assets such as mortgages held by banks (Tables 9 and 10). This allowed banks to switch out of assets which were not acceptable as collateral for inter-bank borrowing into Treasury bills which were acceptable (as well as being saleable) and in this way helping to revive secured inter-bank lending, often done, it would seem, in the form of repos.

Bradford and Bingley (B & B) was the second sizeable British bank to be hit. It had specialised in buy-to-let mortgages, and mortgages based on self-certified income (sometimes referred to as “liar’s loans”). After a period of rapid growth there had been a decline of confidence in B & B’s business model and its credit ratings had fallen leading to the withdrawal of deposits which suddenly began to accelerate; this was the fatal liquidity shock (Table 2). On 29 September 2008 the government took the whole business into public ownership, simply announcing that B & B no longer met the standards of the Financial Services Authority (which required adequacy of both capital and liquidity). The ex-shareholders of B & B, who had their shares taken over by the government, were further angered by having to face a long wait before knowing what compensation they might receive. In the event they received nothing, implying that B & B was insolvent when it was taken over. We shall not pursue the later history of B & B under government ownership.

Royal Bank of Scotland (RBS) was the British bank most heavily damaged by the banking crisis. In 2008 RBS, in conjunction with two overseas banks, was competing with Barclays for the takeover of the Dutch bank ABN AMRO. RBS had suffered solvency shocks from toxic assets early in 2008 but had been able to raise £12bn of new capital through a rights issue to shareholders on 22 April 2008; at the time this was Britain’s largest-ever corporate rights issue (Tables 12; there government is the buyer of the new shares, in this case it is the public but the pattern of entries is the same). Half of this amount was needed to restore the bank’s capital after write-offs on toxic assets (Table 1) the rest to further strengthen RBS’s reserves, both capital and liquidity, ready for success in the takeover of ABN AMRO. Following the collapse of Lehman, the Irish government, becoming fearful for the stability of its own banks, guaranteed the liabilities of its entire banking system on 30 September. On the following day, 1 October, the withdrawal of inter-bank deposits to switch them into this haven of safety inflicted a heavy liquidity shock on other banks (Table 2), particularly RBS and to meet these withdrawals the Bank of England as lender of last resort had to provide it with loans of around £30bn to restore its liquidity (Tables 7 and 8). This help was not made public at the time for fear of its effect on confidence, as had occurred in the case of Northern Rock where knowledge of such help had triggered a run on the bank and a further liquidity shock (Table 2). This lending to RBS was only made public over a year later, in November 2009.

Barclays withdrew from the contest for ABN AMRO on 5 October leaving RBS to announce its successful takeover on 9 October 2008. This success proved to be disastrous, as the parts of ABN AMRO acquired by RBS were found to have large holdings of toxic assets (later revealed to include \$45bn of credit default swaps). When RBS incorporated its share of ABN AMRO’s balance sheet, this led to a further heavy solvency shock (Table 1), amounting to more than the loss of £24bn for 2008 which was revealed by RBS some four months later. On 13 October 2008, only eight days after the takeover, fear that RBS was close to collapse, and the consequences of this for the wider economy, led the government to save RBS by providing it with £20bn of new capital and liquidity (Tables 11 and 12). Meanwhile RBS continued to depend upon the borrowings it had made from the Bank of England starting on 1 October which were to reach a peak of over £36bn on 17 October. Evidently it was also raising liquidity under the SLS (see Tables 9 and 10 and the following paragraph) and under the CGS (see Table 12 and the fourth paragraph following it) to help replace the large withdrawals of inter-bank deposits it had suffered during the crisis.

In January 2009, as the crisis eased, RBS was able to repay all its lender of last resort loans from the Bank of England (Tables 7 and 8, the changes having reversed signs) but 58% of its equity capital

was now in the hands of the government. However, RBS still had heavy holdings of potentially toxic assets which led to the Asset Protection Scheme which is described below. The government now converted the preference shares it held in RBS into equity (Table 14, where in this case preference shares would have to be included with deposits to form a composite group of non-equity liabilities). This raised its ownership of RBS's equity capital to 70%, and it provided a further capital injection (Tables 11 and 12) raising this to 84%. RBS was also given an option to receive a further £6bn injection of capital. This left RBS overwhelmingly owned by the government, paying no dividends, restricted in the payment of bonuses, still subject to write-downs of the uninsured component of its toxic assets which could produce overall losses. It was also faced with the need to replace its large borrowings under the SLS and CGS, which are due to end in 2012 and 2014 respectively. The final judgment on this whole episode can be left to Sir Philip Hampton, the new Chairman of RBS:

I don't think there can be any doubt that the key decision that led RBS to its difficulties was the acquisition of ABN AMRO. That is the painful reality that we can now do nothing to change. With the benefit of hindsight it can now be seen as the wrong price, the wrong way to pay, at the wrong time and the wrong deal.

(Statement at the AGM, 3 April 2009)

Lloyds Bank TSB and HBOS In its annual report for 2007 which appeared early in 2008, Lloyds was able to claim that it had 'no direct exposure to US sub-prime ABS (Asset Backed Securities) and limited indirect exposure through ABS CDOs' although it did concede in the second half of 2007 it had taken a loss of £114m on junior tranche CDOs and had £1.86bn of ABS CDO that were fully cash collateralized. Lloyds could thus claim that it was largely free of this type of potentially toxic asset and that it had a strong capital position and a strong liquidity position.

HBOS, on the other hand, came under suspicion in March 2008 because of its heavy exposure to commercial property loans in a declining property market, but after a sharp fall in the price of its shares it responded to fears over its solvency by claiming that it had a strong capital base. Nevertheless, in April it announced a £4bn rights issue to strengthen its equity capital; but the subsequent fall in its share price meant that when the rights issue came to the market in July some 90% was left with the underwriting banks (Table 12 but with the underwriters and the public providing the funds instead of the government).

Such were their contrasting backgrounds when on 18 September 2008 a mainly healthy Lloyds Bank announced a bid to takeover an already troubled HBOS, subject to the waiving of objections which could be brought under competition law. The Chancellor of the Exchequer, Gordon Brown, played a significant role in facilitating this takeover which went ahead despite many doubts by outsiders, as well as a reduction in the price Lloyds had been offering. It was completed four months later on 19 January 2009. Events in this four month period were to reveal the disastrous nature of this takeover.

As was explained above, the collapse of Lehman on 15 September and the resulting fears that led to the guarantee by the Irish government on 30 September of the liabilities of its own banking system. This set off a surge of withdrawals from other banks to take advantage of the safe haven provided by this guarantee, inflicting a heavy liquidity shock (Table 2) on these other banks including HBOS. On 1 October 2008 this forced HBOS to borrow – again not made public at the time – a large amount, perhaps £20bn, from the Bank of England (Tables 7 and 8). Lloyds and HBOS, now treated

as a single bank (Lloyds Banking Group, LBG), then suffered a solvency shock (Table 1) most of which was attributable to HBOS. (In February 2009 LBG revealed that its takeover of HBOS had cost it an £11bn pre-tax loss.) With LBG now in danger of insolvency, on 13 October 2008 the government felt compelled to provide it with some £17bn of new capital and liquidity (Tables 11 and 12); however its desired liquidity level still required the loans from the Bank of England (which peaked at over £25bn in November 2008). This injection of new capital meant that the government now owned 43% of the equity capital of LBG. In June 2009 LBG had sufficient liquidity and capital to allow it to buy back some of the shares the government had bought when it rescued LBG in October 2008 (Tables 11 and 12 with the signs of the changes reversed) reducing the government's shareholding to 41 per cent. Evidently it had also raised large amounts of liquidity under the SLS (Tables 9 and 10 and the paragraph following) and CGS (see Table 12 and the fourth paragraph following it) to help replace the withdrawals of inter-bank deposits it had suffered during the crisis.

Shareholders in both RBS and the original Lloyds TSB bank were outraged at these disasters. Shareholders in the latter pointed at what they claimed was a £14bn destruction of shareholder value arising from the mismanagement of the bank and misinformation given to shareholders. For both banks action groups were formed to try to recoup their losses from those they held responsible.

Official attention now turned to the danger of solvency shocks (Table 1) from write-downs of the toxic assets still held by RBS and LBG. This led to the government's Asset Protection Scheme (APS) which was intended to insure the two banks – for a heavy but realistic fee – against the greater part of such write-downs. RBS entered the scheme, but LBG, after much negotiation, was able to raise £17bn of new capital through a rights issue, most of it from the private sector (Tables 11 and 12 with investors in place of the government) with the rest from the government's take-up of the rights on its own holding (Tables 11 and 12). This increase in equity capital allowed Lloyds to avoid entering the scheme which it regarded as unduly onerous.

While RBS had already suffered solvency shock from toxic assets before its takeover of ABN AMRO, Lloyds was largely free from this problem until it took over HBOS. Both RBS and Lloyds failed in their conduct of due diligence – the detailed and probing investigation of every aspect of their respective takeover targets which should have revealed any weaknesses in asset quality, capital and liquidity. The due diligence by RBS on ABN AMRO was carried out six months before the deal was completed and, despite the turmoil over this period, RBS did not update its due diligence but relied upon public statements of reassurance by ABN AMRO. In the case of Lloyds, we have the admission that on the HBOS takeover it did only a part of the desirable due diligence. The quality of due diligence done by Barclays on ABM AMRO is not known, but Barclays withdrew from the attempted takeover only eight days before that bank's solvency problems helped drag the victorious RBS to the brink of failure.

We have already seen the damning judgment by the new chairman of RBS on that bank's near fatal takeover of ABN AMRO. A judgment on the Lloyds takeover of HBOS would be equally damning: it was driven by the pursuit of growth by acquisition, encouraged by the intervention of the Chancellor of the Exchequer, at a time of market turmoil, when the target bank was already in trouble and done with insufficient due diligence.

Following these rescues of RBS and Lloyds there was a feeling that the acute phase in Britain's banking crisis was now past, but the fear of after-shocks remained. Two further issues now faced the main British banks. The first was the problem of the longer term replacement of the large volume of inter-bank deposits which had been withdrawn during the crisis (Table 2). These had been temporarily replaced by borrowing under the SLS (Tables 9 and 10) and CGS (Table 12 and the fourth paragraph following it) which has been estimated at £500bn for all British banks with

RBS and Lloyds both heavily involved. These two schemes were temporary emergency arrangements and are scheduled to be closed down by the end of 2012 for the SLS and 2014 for the CGS. The second, for the banks dependent upon capital provided by the government, was the question of their movement out of public ownership. The final decision on this will rest with UK Financial Investments (UKFI) which was set up in November 2009 to manage the government's shareholdings in RBS, Lloyds, Northern Rock and Bradford & Bingley. The Head of Market Investments at UKFI has stated that: "Disposing of these stakes in an orderly manner will be among the most important events in the capital markets over the coming years. It is my intention to use all of my experience to protect and create value for the taxpayer from these investments."

According to UKFI the cost to the government of the two main rescues was some 63 pence per share for Lloyds and 50 pence per share for RBS. In the second quarter of 2010 the market price of the shares in Lloyds ranged between 50p and 71p and those in RBS between 40p and 59p. There is a reasonable prospect that the government could make a considerable profit out of its enforced venture into the temporary and partial ownership of these two British banks. It was reported in 2009 that the Bank of England had already made a profit of around £1bn (part of it going to the Treasury) from its lender of last resort and similar operations at penalty rates and from related fees.

7. HOW WAS IT ALLOWED TO HAPPEN?

Up to now we have been dealing first with matters of classification/taxonomy (Sections 1 – 5) and then with matters of historical fact (Section 6) although some of our institutional and quantitative 'facts' may require correction in the light of further information. But here we have to deal with matters of judgment upon those in positions of responsibility whose actions or inactions contributed to Britain's banking crisis.

British Bankers

There were many management failings which led to Britain's banking crisis:

1. Rapid growth of assets was seen as evidence of successful management and there was failure to give close and probing attention to the quality of these assets. (Earlier the Bank of England would have seen such rapid growth as an important warning of likely deterioration in asset quality, as indeed proved to be the case).
2. Failure to appreciate the danger of relying heavily upon risk-sensitive inter-bank deposits to finance this rapid growth of assets.
3. Risk management systems which were poorly designed or badly calibrated.
4. Failure to anticipate the speed at which solvency and liquidity shocks would develop and the sudden strain this would place upon both capital and liquidity.
5. Seeing takeovers as a means of rapid growth but neglecting to do the necessary and timely due diligence.

(Points 3 and 4 are from the House of Commons Treasury Committee, Seventh Report, 2008-09)

In the USA there has been an emphasis upon greed for money as an important factor in precipitating banking disasters, but in Britain there has always been a sense that at chief executive level it is the

reputation, kudos and deep satisfaction from heading a large, successful and growing bank which is the real spur. Money accompanies this success but it is not seen as the main motivation. However it would appear that the appetite for growth and reputation grew to the point where it disoriented some of these chief executives leading them to lose sight of the dangers they were running, with the results that we have seen. This all adds up to an extraordinary failure in the perception and judgment of risk and in banking prudence. In the Navy an officer who hazards his ship faces a court-martial of experienced senior officers who can impose suitable penalties upon him. There is a strong case for having a comparable court-financial which can impose suitable serious personal penalties upon senior executives who hazard their bank and its shareholders.

Central Bankers, Regulators and Government

The origins of the crisis lay in the United States and looking back over these years one name stands out: Alan Greenspan, Chairman of the Board of Governors of the Federal Reserve System from 1987 to 2006 and in his time the most influential central banker in the world. It was he who had been responsible for overseeing the soundness of the US banking system and deciding the level of short term interest rates required for the appropriate macro-management of the US economy. There had already been some criticism that after the tragedy of 9/11 he had reduced interest rates too far and kept them low for too long. This allowed the US housing boom to get out of control and leading to an unknown proportion of poor quality sub-prime mortgages being packaged into CDOs and sold often to other banks. Together with direct holding of sub-prime mortgages, these formed the toxic assets which were at the core of the banking crisis.

This CDO business was very profitable and initially no one noticed, or cared to notice, this contamination by doubtful mortgage assets, particularly the banks who packaged them into CDOs. Of the banks who bought these CDOs, some relied upon the reputation of the US banks who packaged and sold them, others placed their reliance upon Credit Default Swaps (CDSs) – insurance against losses on these CDOs – supplied by such insurance companies as AIG. But neither they nor the US authorities took any steps to examine whether the premiums being charged by these insurers were adequate in relation to the risks they were covering. In 1998 the Commodity Futures Trading Commission raised doubts about this and urged that these insurers should come under their supervision but, opposed by Greenspan on the grounds that markets could take care of themselves, this was turned down. Further, the very structuring of these insurance contracts as credit default swaps seems to have been aimed at emphasising their character as derivatives and so keeping them away from the supervision of any insurance regulators.

It was only when the danger of these toxic assets had generated a wave of solvency and liquidity shocks to much of the western banking system and Lehman had collapsed that the role of Greenspan in the crisis was made clear to the public through his testimony to the US Congress on 23 October 2008:

Greenspan: I made a mistake in presuming that the self-interest of organisations specifically banks and others were such that they were best capable of protecting their own shareholders. I have been dealing with the American economy for sixty years. That premise always worked and I was shocked into disbelief that what unfolded was a complete breakdown of that premise.

(Transcribed from BBC ‘The Love of Money’ Sept 2009)

In short, Greenspan's approach to regulation was 'light touch' – leave it to the market – or as one commentator said, leave it 'to the greediest people on Wall Street. . . . to those who were there just to make money'.

The same light touch approach was adopted in Britain when responsibility for bank regulation was removed from the Bank of England and handed over to the Financial Services Authority (FSA) by Gordon Brown in 1997. It was referred to and praised by members of the government on many occasions, for example, in the 2006 Mansion House speech by the Chancellor of the Exchequer:

Gordon Brown: Many who advised me, including not a few newspapers, urged that in Britain there be a regulatory crackdown. I believe we were right not to go down that road, and we were right and continue to be right, to continue to improve our light touch regulatory system.

(Transcribed from BBC 'The Love of Money' Sept 2009)

Also in 2006, Gordon Brown welcomed Greenspan as an Honorary Adviser to the UK Treasury.

The nature of this light touch regulation was outlined by Hector Sants who became Chief Executive of the FSA in July 2007:

Hector Sants: 'The prevailing climate at the time and indeed right up till the crisis commenced was that the market does know best....The FSA didn't really look forward and didn't make judgments....if there's a risk of your business model running into difficulty we won't come and say to you "you shouldn't be doing that". The FSA was not a forward looking organisation in respect of business model risk.'

(Transcribed from BBC 'The Love of Money' Sept 2009)

Such was the FSA's light touch regulation which prepared the way for Britain's deeply damaging financial crisis. As the crisis developed the loudest noise was that of the stable door being slammed shut after the horse had bolted. There was an astonishing volte face by those who had presided over the light touch system, people who in their position should have had a wide knowledge and experience of the British banking system and of its history of occasional upsets and crises. They should have recognised and accepted their duty to question publicly the adequacy of the light touch regime imposed upon them by a politician. Instead they just followed orders – an excuse that has been firmly rejected so many times in different and grimmer circumstances in the past decades. Now, after the disaster, we see the re-discovery of the type of supervisory arrangements that had been used by the Bank of England before the FSA took over. It is as if someone had casually switched off the safety system in a nuclear power plant and then, after the disaster, hastily decided it would be a good idea to switch it on again. One important piece of unfinished business is to establish the exact circumstances of the move to light touch regulation in Britain, in particular what advice and what pressures faced the Chancellor of the Exchequer.

8. CAN WE STOP IT FROM HAPPENING AGAIN?

Looking back at the Bank of England's approach to bank supervision which preceded the light touch regime, we see much that has suddenly come back into fashion. To look at just some of its leading features, the Bank paid close attention to capital ratios to ensure that they were adequate together with emphasis on asset quality, stressing that rapid growth in assets was an important danger sign of declining asset quality (later this was to be the core of the banking crisis). It used a liquidity ladder to reveal any potentially dangerous degree of term mismatch between liquid liabilities and liquid assets, and it emphasised consolidated supervision to rule out off-balance-sheet devices which could massage illusory improvement into a bank's capital ratio. In addition to receiving regular and detailed returns from banks it emphasised supervisors visiting banks to see them in operation on their own ground, having constructive discussion with bankers and building up experience in the process. Experienced supervisors, having an inside view of many banks, brought fresh eyes to banking operations and their effects on the viability of a bank; indeed they could become almost like consultants helping to educate and spread best practice. These supervisors carried with them the ethos of the Bank of England with its integrity and sense of trusteeship for the stability of the British banking system, which formed an effective barrier to regulatory capture. Further, they carried with them the prestige of the Bank of England. Not all bankers would welcome clear-eyed supervisors but few bankers would wish to antagonise the Bank, which was well-informed, widely consulted and had power, including market power as lender of last resort, to make its concern or displeasure felt. Having this power behind them allowed supervisors the flexibility to give due weight to principles but to take account of surrounding circumstances. Without it they would have had to rely more upon rigid rules which would have made the supervisory process less acceptable and less co-operative. It is worth noting that here we have not ourselves used the term regulation, which carries the overtones of a dirigiste regime imposed from the outside the banking system. We have preferred the Bank of England's earlier term of supervision, which implies closely overseeing the banks to ensure (and having the power to ensure) that they follow the agreed canons of sound banking.

If such a regime of bank supervision had been in place it is reasonable to conclude that Britain's banking crisis of 2007–09 would not have occurred. Indeed, this is the implicit judgment of the newly galvanised FSA and others concerned with restoring effective bank supervision. They evidently believe that they can prevent any recurrence of such a crisis by re-introducing what can be seen as the main features of the Bank of England's supervisory regime, clearly implying the belief that its presence would have prevented the crisis in the first place. While bankers would have been fully conversant with Gordon Brown's light touch regulation, it would seem that there were many quite well-informed people outside the banking system who were unaware of just how far the FSA had switched off its oversight of the banks and how fatally weak it was as a safeguard for the health of the banking system. This emphasises the importance of the FSA's new supervisory regime being not only well-designed and well-managed but also as open as possible about its approach, its methods and its performance. [Since the above paragraphs were written, it has been announced that responsibility for the supervision of the banking system is to be returned to the Bank of England].

One danger now is that having seen the British banking system nearly lose its trousers, mainly because of earlier supervisory laxity, reformers are in danger of stampeding into overkill, insisting that for safety every bank must now have not only a new belt, but also braces and surgical boots, with a lien on a wheelchair and burial plot – just in case. Many of their proposals have not been fully thought through; they blame bankers for the disaster but fail to place equal or greater blame on the light touch regulation in force at the time, and they implicitly assume that the new regime of bank supervision will be as weak as the light touch system it has replaced. On this basis each reformer claims that we should adopt their own particular nostrum. On present showing it is more

reasonable to assume that the new regime of supervision will be effective, certainly effective enough to perceive and prevent the extraordinary management failures which brought about the banking crisis. This strengthens the case against the more far-reaching and disruptive proposals for reform.

Some reformers have a hankering after automatic features such as cyclically adjusted capital ratios, raising echoes of the old debate over 'Rules versus Discretion' in monetary policy. But how are any such rules to be formulated if we cannot foresee the future with any precision?

Alan Greenspan: Crisis will happen again but it will be different – it is human nature. Until someone can find a way to change human nature we will have more crises. None of them will look anything like this [one] because no two crises have anything in common except human nature. (Loc. cit.)

Greenspan appears to have forgotten one part of his own precept when he put all his faith in the human nature of American bankers, but the other part – that next time it will be different – has some weight. The case for the adoption of any rigid rule such as a cyclically adjusted capital ratio assumes that all concerned can (1) agree upon an appropriate cyclical indicator and measure it accurately with a very short time lag and (2) agree upon a suitable relationship between this indicator and the capital ratio. It also assumes that such action would be more timely and effective than discretionary action and that it would not give rise to unacceptable adverse unintended consequences. Rather than such a rigid rule made perhaps many years earlier and reflecting the circumstances then current, there is a strong argument for preferring discretionary action near in time to the problem and aware of the existing surrounding circumstances. This action would require a supervisory authority with a strong sense of trusteeship for the health of the banking system which would make it willing to take unpopular measures if necessary. We have to ensure that we have such a supervisory authority.

Other reformers urge that no bank should be permitted to become too big to be allowed to fail. A solvency shock (like the sub-prime shock which emanated from the US) to our system with four large banks could be of a size to cause one of them to approach failure and, for the wider good of the economy, requiring it to be rescued with public money. But if the system consisted of twenty smaller banks delivering the same banking services and therefore with a comparable aggregate balance sheet structure, such a shock could be expected to cause five of them to approach failure and again, for the wider good of the economy, requiring the five of them to be rescued with public money. For any given menu of banking services and aggregate balance sheet structure, it is the size of such a shock relative to the banking system which matters rather than the size of the individual banks. On the other hand, if there is a purely internal shock to an individual bank arising from mismanagement to the point of failure, with this somehow escaping the notice of an effective supervisory regime, then if the bank is large it would have to be saved, but if it is small it could be allowed to fail. However, as an argument for drastic intervention to limit the size of banks this seems far-fetched and unconvincing, particularly as such intervention necessarily involves penalising successful and sustainable growth. Density of counterparty interconnection within the banking system is indeed of concern because the failure of an important nodal bank would spread its effects widely over the system, threatening the survival of many other banks; but neither HBOS nor Lloyds appear to have had such potentially dangerous interconnection so that this is not necessarily related to size.

Some propose ‘narrow banking’, where on the liabilities side the risk to all depositors is reduced to zero, requiring on the assets side that banks hold only riskless government debt. This would obliterate the banking system’s present major role of maturity transformation and risk pooling to provide well-managed commercial and mortgage lending on a large scale. One can conceive of ways of replacing banks in this role but this would require massive re-design of the system and none of these proposals offers any convincing practical solution. Deposit insurance seems a more promising and much less drastic way of directly reducing depositor risk.

A broader insurance fund has been proposed, financed by the banks, which would avoid any use of public money in dealing with the affairs of a failing/failed bank with every bank having a ‘living will’ which would provide the information necessary to deal quickly and efficiently with its liquidation. An objection to such an insurance fund has been that it creates moral hazard, because it could encourage a bank’s management to take on excessive risk. Then if this were to occur, with failure becoming imminent, smoothly liquidating such a bank and doing nothing further would implicitly condone this bad management. This is the moral hazard. To avoid it, the supervisory authority should be required to investigate the management of any failed bank and take action to impose penalties upon those individuals who had culpably mismanaged its affairs. If a failing bank is rescued, to avoid this moral hazard the rescuer should adopt a more explicit targets/tools approach:

- A.** Clarify the points at issue: in this case distinguish between
 - (i) the bank as a business
 - (ii) its management.
- B.** Target 1: save a viable banking business
 - Tool 1: bring in new management.
- C.** Target 2: penalize bad management
 - Tool 2: when dismissing the old management, ask the supervisory authority to investigate their performance and take action to impose penalties upon those individuals who had culpably mismanaged the bank’s affairs.

Clearly the supervisory authority should have such powers and responsibilities as well as a menu of suitable personal penalties, perhaps exercising them through a court—financial as suggested above. This should be sufficient to offset much of the temptation to take on excessive risk (and not only that arising from the existence of such an insurance fund). In the recent crisis those regarded as the architects of bank failure have suffered little more than loss of job and/or damaged reputation; there is a strong case for significant personal financial penalties as well. (The FSA has recently fined some bankers, but only for mis-reporting data.)

Yet another group of reformers demand the separation of retail banking (steady and safe) from investment banking (risky and dangerous). But as we have seen, it was poor basic commercial banking – the failure to maintain asset quality – compounded by inadequate due diligence in takeovers which were the core of the banking crisis in Britain. Light touch regulation stood back and allowed these to happen. Structural reform such as separating retail from investment banking would not have prevented them: HBOS could still have engaged in ill-judged commercial property lending and RBS could still have been seduced by the attractions of what it failed to recognize as toxic assets. Only effective bank supervision can prevent such inept banking and self-destructive takeovers from occurring in the future. Meanwhile Britain’s other universal banks, combining both retail and investment banking, offer a full range of services which, combined with their weight in the market, allows each of them to meet the financing requirements of business from the local level

up to the largest British and international corporations. In an increasingly global market with a growing number of very large corporate customers it would be perverse and parochial to curtail their ability to compete with other major banks by imposing an irrelevant and rigid legal separation between the two types of banking in Britain. Further, rigid demarcation could prevent either part from adapting efficiently to a changing world. Such a separation would be a doctrinaire and inward-looking blow to some of Britain's most important and outward-looking businesses. It is hard to see any case for legally splitting up Britain's universal banks in this way. What is required is effective bank supervision.

There have also been suggestions for reform which are milder in character. One is to strengthen the role of part-time directors as guardians within a bank of the shareholders' interest, perhaps having some elected directly by shareholders. Here one can see difficulties in combining collegiality with criticism. Another suggestion is that all supervisory staff (and bankers also) should have proper training in detailed banking and financial history and pathology. This would greatly strengthen the understanding and judgment of all concerned, as well as providing a battery of examples helping more junior supervisors to face up with confidence to the occasional arrogant banker who is certain that his higher pay indicates his superior judgment.

Far-reaching proposals for reforming the structure of the British banking system appear to be quick reactions to the banking crisis and as such they lack depth and cogency. In return for doubtful gains they promise: drastic changes requiring much detailed and stressful negotiation with some uncomfortable outcomes; the trauma and cost of implementation; foreseeable effects on the competitiveness of British banks and London as an international financial centre; and the likelihood of adverse unintended consequences occurring in a reformed legal and therefore rigid structure. This reveals an imbalance between prospective reward and prospective cost, together with the danger that unacceptable changes proposed for British banks could lead some of them to move to less onerous jurisdictions. It suggests that the main way forward in ensuring the stability of the banking system has to lie with the institutional structure broadly as it is now, effectively supervised along the lines developed by the Bank of England before 1998 and broadly reinstated recently by the FSA. This could take account of changing circumstances and could be conducted in a manner which would gain the respect and co-operation of those who are being supervised.

There is a further important issue which has yet to be addressed: how should we deal with a serious sectoral problem such as Britain's house price boom and bubble. The Bank of England/MPC together with the Treasury have responsibility for the dynamic steering of the whole economy; the reformed FSA (here including its successor) has responsibility for maintaining the sound structural state of the banking system. But who is to be responsible for steering a sectoral development away from becoming a danger to the economy as a whole (which would intrude upon the role of the Bank of England/MPC and the Treasury). This would require someone with clear sectoral responsibility and with the corresponding sectoral policy tools. In the case of housing and mortgages this would mean powers to limit bank lending by setting maximum permitted ratios of mortgage loan to value, mortgage payments to income or mortgage asset class to bank capital. However, using such measures for steering would affect the balance sheet structure of banks and intrude upon the role of the FSA in maintaining the sound state of the banking system. At present we are left with these unresolved issues of responsibility and coordination.

Re-establishing the effective supervision of British banks in the light of our banking crisis of 2007–09 appears to be well under way, but British banks are part of a world-wide financial system. For some the next stage is securing agreement to an international system of supervision which will be fair, uniform, commercially reasonable, suit all the members of the system and avoid regulatory arbitrage. Success in such a heroic undertaking seems very distant and quite possibly out of reach.