SMALL LESSONS FROM A BIG CRISIS

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Macro-prudential policy is a new ideology and a big idea. That befits what is, without question, a big crisis. There are a great many unanswered questions before this ideology can be put into practice. These questions will shape the intellectual and public policy debate over the next several decades, just as the Great Depression shaped the macroeconomic policy debate from the 1940s to the early 1970s.

But there are already some smaller lessons to be drawn from crisis events. That is the purpose of these comments. Seven issues arising from the crisis are discussed and their implications for policymakers and practitioners assessed.

If there is a unifying theme, it is informational failure. This has been a crisis borne of, and prolonged by, lack of information. That fog of uncertainty remains dense 18 months on. Because financial markets are, first and foremost, a market in information, these informational failures have generated prolonged paralysis in financial markets. Tackling them is priority number one.

Lesson 1: Finance is no golden goose

Imagine having placed a hedged bet back in 1900. A £100 long bet is placed on UK financial sector equities together with a £100 short bet on general UK equities. In effect, this is a gamble on the UK financial sector outperforming the market. How would that bet have performed over the intervening 110 or so years?

Chart 1 provides the answer. For around the first 85 years, this gamble looks like a rather staid strategy. By 1985, it would have delivered a capital sum of £500, at a modest annual average return of around 2% per year. There were periods of both over-performance (1900-1944) and under-performance (1971-1986) by the financial sector over this period. But, give or take, this was close to a break-even strategy.

The following twenty year period, from 1986 to 2006, transformed that picture. By the end of 2006, the once-staid strategy would have delivered a capital sum of over £10,000, at an annual average return of over 16%. Banking became the goose laying

the golden eggs. There is no period in recent UK financial history which bears comparison.

The past two years have undone most of those gains. The cumulative fall in UK bank equities up to its low point in March is the largest on record at over 80%, outstripping the fall following first oil price shock in 1973/74 and the stock market crash of 1929. By the end of 2008, the banking gamble would have delivered a capital sum of £2,200, at an annual average return over the 110 year period of less than 3%. Financials have reverted to being close to a break-even strategy. That is broadly what long-run growth theory would lead us to expect.

So what lessons should we take from this? Many practitioners and policymakers were seduced by the excess returns to finance during that twenty-year golden era. Banks appeared to have discovered a money machine, albeit one whose workings were sometimes impossible to understand. One of the South Sea stocks was memorably "a company for carrying out an undertaking of great advantage, but nobody to know what it is".[1] Banking became the 21st century equivalent.

We should aspire to a financial system where there is greater market and regulatory scrutiny of future such money machines. In achieving this, there is a role for some body – a systemic overseer – which is able to detect incipient bubbles and fads and, as importantly, act to correct them. This role is about removing the punchbowl from future financial sector parties.

Lesson 2: Unless the golden goose is geared

At one level, the crisis tells us that banks may not be special after all, at least in terms of their long-run profitability. There is, however, one dimension along which banks are a different animal - leverage. To see this, consider a simple decomposition of return on equity (ROE) for a firm:

(1) ROE = Return on Assets * Leverage

[1] Charles McKay (1841), "Memoirs of Extraordinary Popular Delusions and the Madness of Crowds", London: Richard Bentley.

The first term is a measure of management skill in extracting profits from a pool of assets. The second is a measure of gambler's luck in gearing up those assets. In effect, ROE is skill multiplied by luck. So which has been the dominant determinant of banks' ROE, historically and recently?

Chart 2 looks at the decomposition given by equation (1) for UK banks over the period since 1920. Movements in leverage have clearly been the dominant driver. Since 2000, rising leverage fully accounts for movements in UK banks' ROE – both the rise to around 24% in 2007 and the subsequent fall into negative territory in 2008.

Chart 3 looks at the same decomposition across a panel of 70 global banks at the end of 2007. The vertical axis measures return on assets and the horizontal axis leverage. The curves are iso-ROE lines, drawn at 5%, 20% and 40%. The distribution of points lies along a downward-sloping curve. Two implications follow from this.

First, the downward slope is consistent with global banks targeting a ROE, perhaps benchmarked by peers' performance. The Bank's market intelligence in the run-up to crisis suggested that such "keeping up with the Jones's" was an important cultural influence on banks' decision-making. Second, Chart 3 suggests that banks kept up in this competitive race by gearing-up. Banks unable to deliver sufficiently high returns on assets to meet their ROE targets resorted instead to leveraging their balance sheets.

During the golden era, competition simultaneously drove down returns on assets and drove up target returns on equity. Caught in this cross-fire, higher leverage became banks' only means of keeping up with the Jones's. Management resorted to the roulette wheel. As firms collectively migrated South-east in Chart 3, leverage increased across the financial system as a whole. Having bet the bank on black, many financial firms ended up in the red.

Two lessons for the future suggest themselves from this prognosis. First, when evaluating banks and their management, there is a need for greater focus on returns on assets rather than on equity. Good luck and good management need to be better distinguished. Put differently, returns to investors and managers need to be more

accurately risk-adjusted if the right balance between risk and return is to be struck for individual firms and for the financial system as a whole.

Second, there is a need to place much stricter system-wide limits on leverage. These limits should aim to prevent the South-Easterly migration by banks under competitive pressure. That suggests these ratios will need to be state-dependent, rising as the temperature rises across the financial system as a whole. Some have called this a counter-cyclical regime. Given its source, it might better be called a counter-cultural regime.

Lesson 3: Size does matter

The "80/20 rule" has its origin in the study of contagious diseases. For a number of diseases, 20% of the population account for around 80% of the disease spread. The present financial epidemic has broadly mirrored those dynamics. The failure of a core set of large, interconnected institutions – Fannie and Freddie, Bear Stearns, Lehman Brothers, AIG – contributed disproportionately to the spread of financial panic.

Epidemiology provides a second key lesson for financial policymakers – the importance of targeted vaccination of these "super-spreaders" of financial contagion. Historically, financial regulation has tended not to heed that message. As Chart 4 demonstrates, larger polygamous financial institutions have if anything run with lower capital buffers than their smaller monogamous partners.

There are two potential explanations for this seemingly perverse result. First, Basel II conferred diversification benefits on larger firms. Second, even ahead of crisis there was a market expectation that larger firms were more likely to receive government support. As Chart 5 illustrates, those expectations have subsequently been validated by events, with the largest packages of official sector capital support having gone to the biggest global banks. Hastily convened marriages between institutions during the crisis have increased the size and degree of concentration within the banking industry.

So regulation may have contributed to perverse risk-taking incentives among large, interconnected firms. And subsequent interventions may have worsened those

incentives. In response, the authorities in a number of countries have recently announced their intention to tackle this incentive problem, by better aligning regulatory taxes with firms' systemic importance. No country has as yet turned that statement of intent into an operational framework for systemic regulation. Doing so will require an understanding of the network of connections between firms, which at present is lacking.

Lesson 4: Banks cannot "pass" a stress test

Over the past six months, stress-tests have moved from the back-offices of risk managers to the front offices of the world's media. Assessments of the balance sheet consequences of tail macroeconomic risks are now in the bloodstream of financial policymakers. They also appear, belatedly, to be entering the bloodstream of financial firms. That is real progress.

But as with all technical progress, there is some danger of an overshoot. While the inputs to, and outputs from, stress-testing are statistical, the inferences reached from them are necessarily subjective. Stress-tests are probabilistic and state-dependent judgements. Two of the key judgements are, first, what prescribed stress scenarios are appropriate inputs; and second, what thresholds for satisfying these stress-tests are set. Both are fiendishly difficult.

On the first, a stress scenario is just one point in a probability distribution. Which point to choose – indeed, which distribution to choose – is a matter of judgement. Consider the two distributions for UK GDP growth shown in Chart 6, one taken from the ten years to 2007, the other across a longer 150-year sample.[2] The standard deviations of these two distributions differ by a factor of 4.5. For a financial firm that is 30-times leveraged, that can easily be the difference between landing in the red rather than the black. In that sense, stress tests are not something it is possible definitively to "pass" – though experience suggests they are somewhat easier to "fail".

[2] See Haldane (2009a), "Why Banks Failed the Stress Test". See www.bankofengland.co.uk/publications/speeches/2009/speech374.pdf

On thresholds, determining the optimal level of capital for a bank is an area which has been chronically, and perhaps surprisingly, under-researched. Policymakers have repeatedly ducked this question. Aggregate amounts of capital in the financial system have been fixed at the same levels which prevailed at the time of the first Basel Accord. And academics have, to my knowledge, no definitive quantitative answer to the optimal capital question.

Longer runs of data, while interesting, are far from definitive. Over the past 150 years, capital ratios among US commercial banks have fallen roughly by a factor of ten (Chart 7). Is the optimal capital ratio to be found from experience in the 1990s – roughly, 5%? Or from the interwar years – roughly 10%? Or from the latter half of the 19th century – between 20% and 40%?

Answering those questions will mean reassessing the validity of the Modigliani/Miller (MM) theorem in today's capital markets.[3] MM states that firms' debt/equity ratios are essentially irrelevant to their total cost of capital. Why? Because a rise in leverage generates offsetting movements in the cost and risk of banks' capital, in a frictionless world leaving the risk-adjusted cost of capital unchanged.

By revealed preference, owners and managers of banks have rejected the MM hypothesis. They seem to perceive that raising equity is, in some sense, costly. Perhaps they are right. But, equally, it is possible that these perceptions are distorted – for example, because the cost of equity is mistaken for the total cost of banks' capital, or because managerial and shareholder incentives are linked to equity rather than asset returns, as outlined earlier. Either way, the MM hypothesis needs to be objectively reassessed in a banking context. And until then, stress tests need to be administered with a healthy dose of realism.

Lesson 5: The plumbing worked

With so much having gone wrong during this crisis, it is easy to overlook what has gone right. Well-functioning payment and settlement systems – the plumbing of the

[3] Miller, M and Modigliani, F (1958), "The Cost of Capital, Corporation Finance and the Theory of Investment", *American Economic Review 48 (3).*

financial system – are one such unheralded success. To my knowledge, there are no examples of these systems collapsing under the strain of the financial crisis. This is no small achievement. Pressures on participants within payment systems have been acute. And volumes flowing through these systems have picked up sharply during periods of volatility in asset prices – for example, in the foreign exchange settlement system CLS (Chart 8).

The robustness of these systems is no fluke. It is testimony to the efforts made over the past twenty of so years, initially by central banks, to proof these systems against systemic risk. These developments included the introduction of real-time gross settlement (RTGS) in payment systems, delivery-versus-payment (DvP) in securities settlement systems and payment-versus-payment (PvP) in foreign currency settlement systems. These innovations effectively removed principal counterparty risk from the transactions equation.

This infrastructural revolution largely went unnoticed at the time and risks going unnoticed now. Its effects can be seen by counter-factually asking what might have happened during the present crisis without it. With counterparty risk preserved, banks would have delayed payments or transactions for fear of extending uncollateralized credit to institutions of unknown credit quality. Payment systems may have suffered the same seizures felt by money markets during the crisis. There would have been an irreparable blockage in the plumbing.

In the event, activity in most financial markets has remained strong, allowing risk to be traded and relocated. Robust payments infrastructure played a key, if largely silent, role in this positive outcome. Though neither visible nor audible, this underscores the importance of systemic oversight, and redesign, of payment and settlement infrastructures by central banks.

Lesson 6: But some plumbing was missing

The infrastructure of financial markets extends well beyond payment and settlement systems – for example, into the area of trading and clearing systems. Here, crisis events suggest scope for improvement. A number of markets have seized during the

past 18 months, including at various times the foreign exchange swap market, the corporate bond market, structured credit markets, various derivative markets such as CDS and, perhaps most strikingly, the money market.

These are all Over-the-Counter (OTC) markets. As such, they do not typically benefit from clearing through a Central Counterparty (CCP). CCPs effectively eliminate counterparty risk between trading participants. This crisis has been, first and foremost, a crisis of counterparty risk. So it is perhaps unsurprising that some OTC markets without a CCP have been hardest hit.

Against this backdrop, the US authorities have recently proposed the extension of central clearing to all standardised OTC derivative instruments.[4] This is a bold measure and one which deserves international support. In time, it might usefully be extended beyond OTC derivatives to some cash OTC instruments, such as corporate bonds. The benefits of this shift are essentially threefold.

First, central clearing encourages standardisation and simplification of the contractual terms of financial instruments. Instrument complexity has been a key fault-line exposed during the crisis, especially among bespoke structured credit products. Ahead of crisis, standardisation was seen as a pre-requisite for central clearing. CCPs should be better seen as a catalyst for such standardisation. In future, infrastructure design might usefully shape market convention, rather than vice-versa.

Second, because a CCP represents a potential single point of failure, it needs to be bullet-proof. Standards of resilience should be comparable with other public utilities, such as water, gas and electricity. That has implications both for CCP risk management standards and for governance arrangements. Both need importantly to weigh the public good of systemic risk containment.

Third, a CCP condenses the dense network of interconnections between firms into a sequence of simple bilateral relationships with the CCP. The cats-cradle becomes a

[4] See http://www.treas.gov/press/releases/tg129.htm.

hub-and-spokes. This can have important benefits in reducing uncertainty among market participants, which might otherwise impair the functioning of markets.

As an illustration, Charts 9 and 10 consider the pricing of CDS contracts.[5] Pre-crisis, with counterparty risk low, the numbers of counterparties in the network chain is essentially irrelevant for CDS pricing (Chart 9). That picture changes dramatically once counterparty risk rises (Chart 10). Indeterminacies in CDS prices – and thus market impairments - then arise. These are larger, the greater the length of the network chain.

A CCP effectively cuts through this uncertainty problem. By interposing itself in each transaction, it condenses the network chain to a single link. Counterparty uncertainty is all but eliminated - and with it indeterminacies in prices and the potential for financial market impairment.

Taken together, these benefits present a compelling case for reform of the post-trade infrastructure of a number of OTC markets. Delivering that reform may call for a rather more interventionist stance by the authorities than has been the case in the recent past. Past revolutions in the payment and settlement infrastructure may provide a road-map for delivering that reform and for understanding its benefits.

Lesson 7: Banks' profits were the problem – but are now the solution

The shock to global banks' profitability from the crisis has been sharp and severe (Charts 11). Judging by the response of banks' equity prices, it may also be prolonged. Despite the recent recovery, the market capitalisation of global banks has fallen by $3 trillion since the crisis began. In part, this is a reflection of banks' business models having been reassessed. But it also reflects fears of future intervention to curtail banks' risk-taking and profit-seeking.

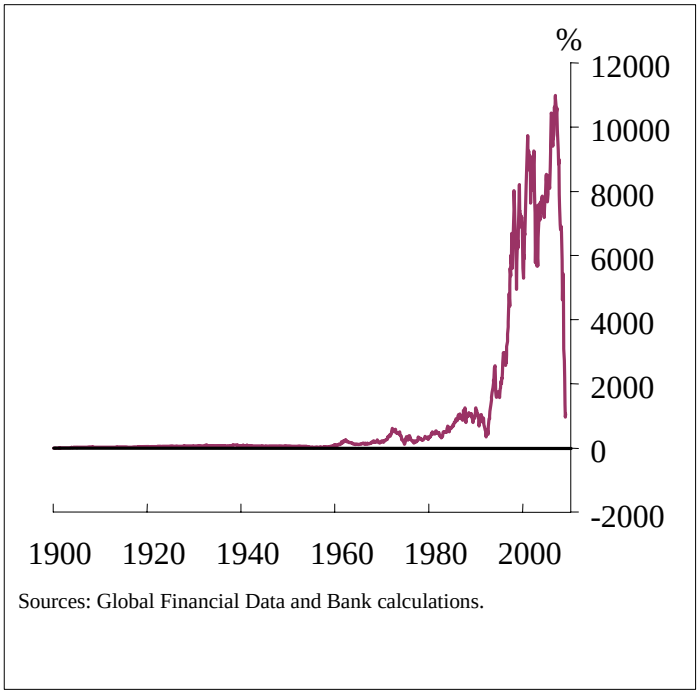
[5] Further analysis is given in Haldane (2009b), "Rethinking the Financial Network". See www.bankofengland.co.uk/publications/speeches/2009/speech386.pdf

As unfashionable as it may sound, it is important that banks' profitability picks up, sharply and durably, in the period ahead. From a systemic perspective, this is in the interests of both the financial system and the real economy.

In the short term, lending by banks is a necessary condition for recovery in the real economy. And a recovery in lending is best achieved if banks believe new loans will be profitable. Some of the pre-conditions for profitable lending are already in place. For example, margins on new lending have widened fairly sharply, as new lending terms have been re-priced (Chart 12). In other industries, this would serve as the price signal inducing existing banks to begin lending and for new banks to enter the lending market seeking market share.

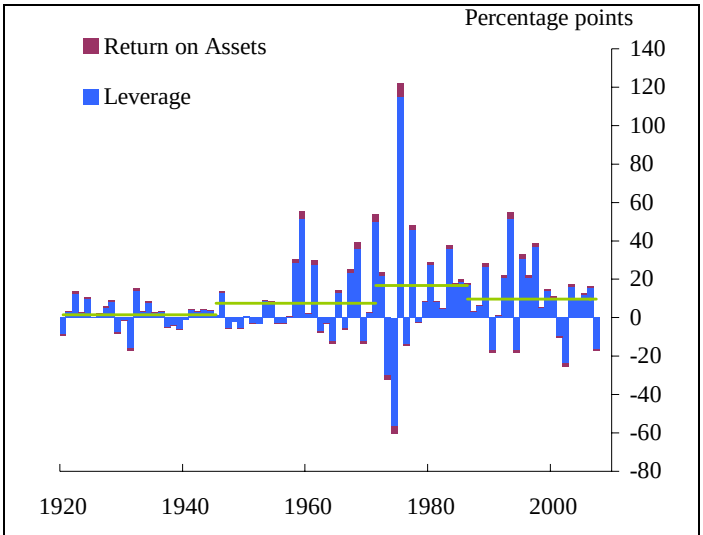
Over the medium-term, global banks have a hefty repayment schedule to governments and central banks. Encouragingly, the flow of repayment has already commenced for some banks. But repayments still total several trillion dollars and are spread over several years. Banks' future profit streams are a key means of securing these repayments and thereby restoring banks to normality. Bank profitability may well have been the route into the present crisis. But it may also be a route out.

Chart 1: Cumulative excess returns to finance



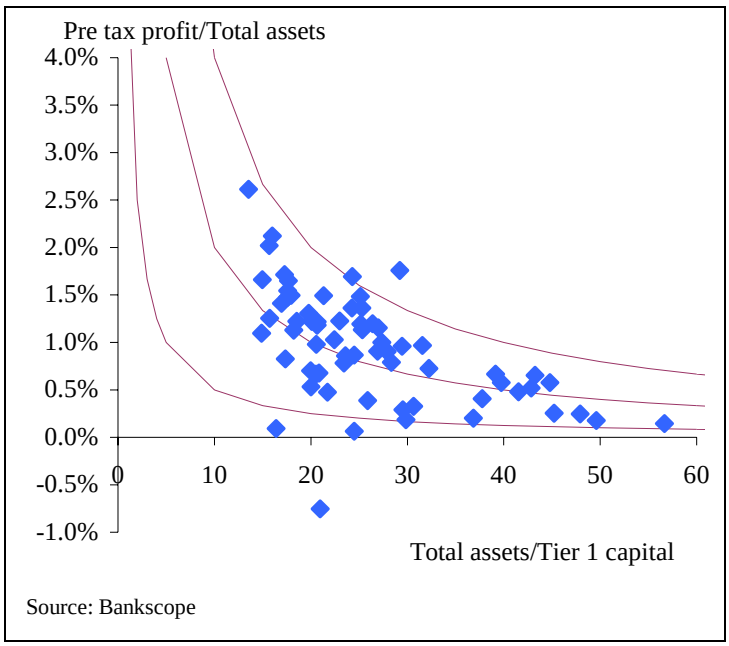
Sources: Global Financial Data and Bank calculations.

Chart 2: Contributions to year-on-year UK financial equity returns



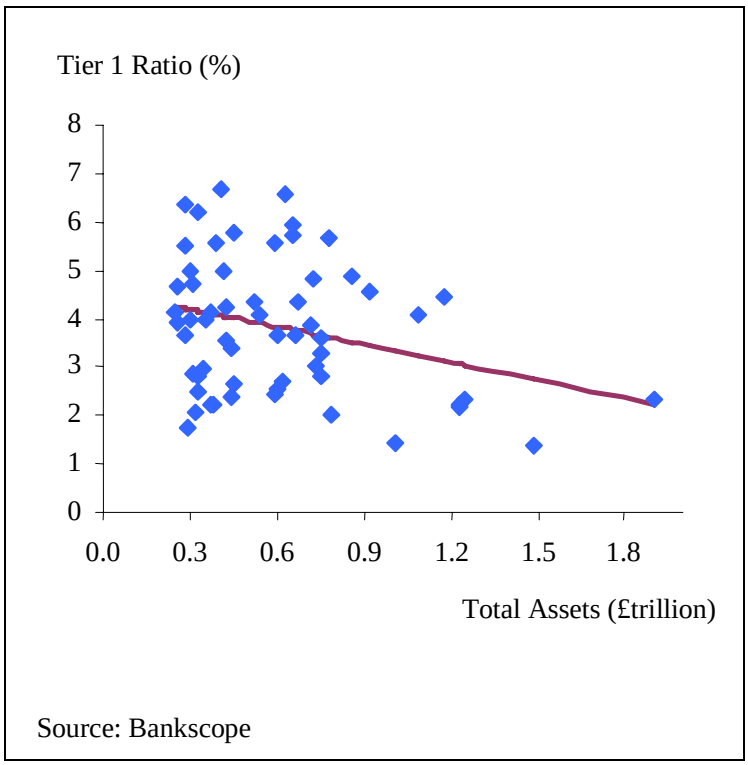
Sources: Global Financial data, MFSD and FRD.
(a) Using year-on-year observed return on equity and observed unweighted leverage ratio to infer year-on-year returns.
(b) Green lines show period average effect of leverage on year-on-year return on equity for 1920-1945, 1945-71, 1971-86 and 1986-2007.

Chart 3: Return on assets and leverage for global banks, end-2007



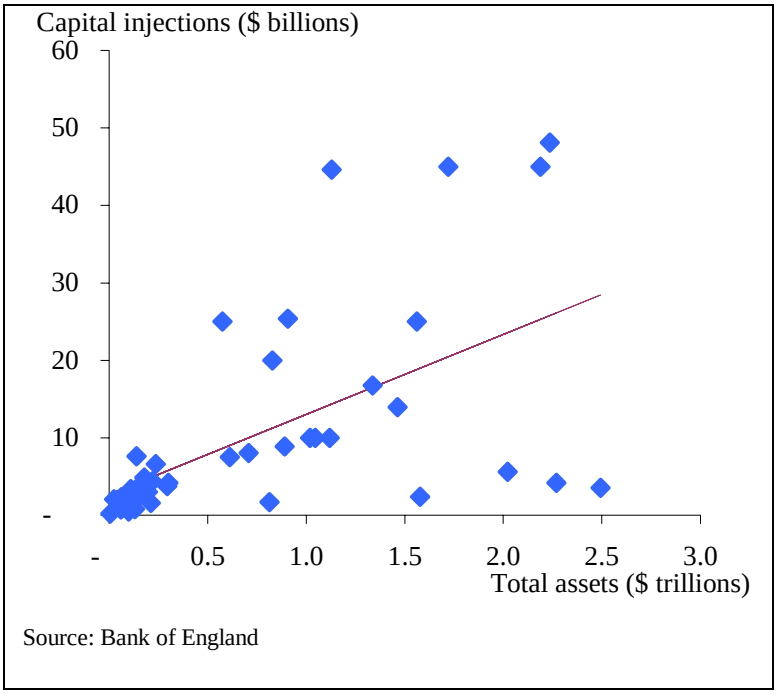
Source: Bankscope

Chart 4: Tier 1 Leverage ratio and Total assets for global banks, end-2007



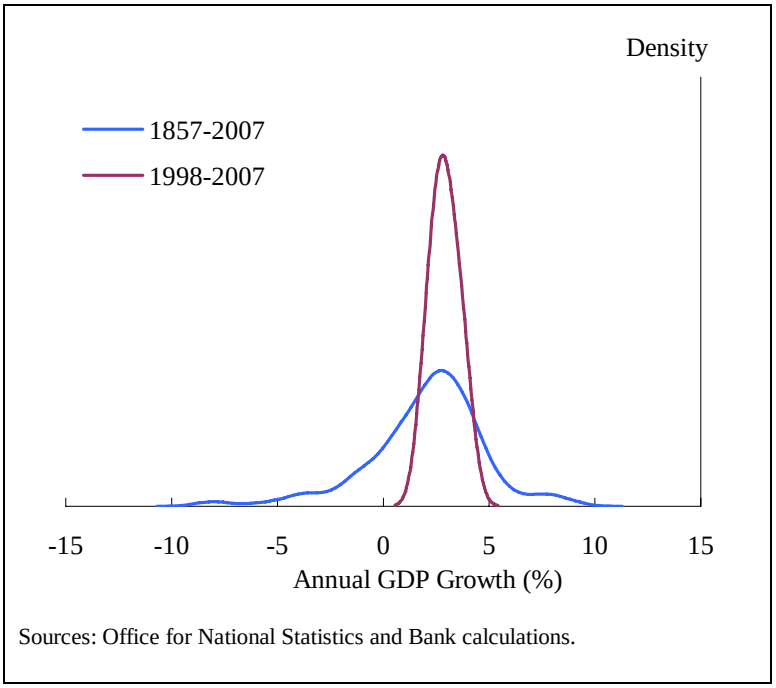
Source: Bankscope

Chart 5: Capital injections and balance sheet size, end-2007



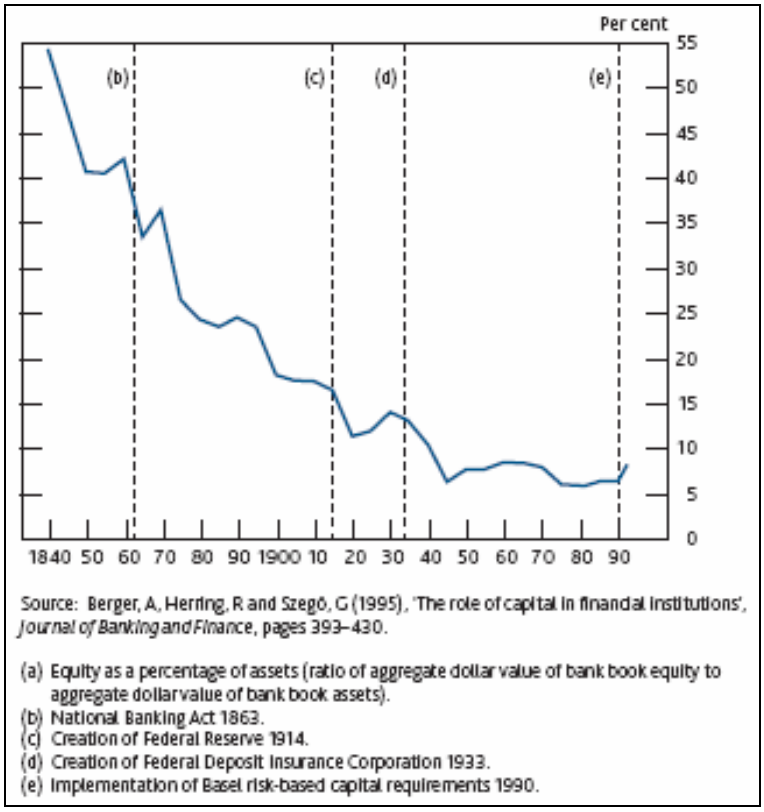
Source: Bank of England

Chart 6: Probability Densities of UK GDP Growth



Sources: Office for National Statistics and Bank calculations.

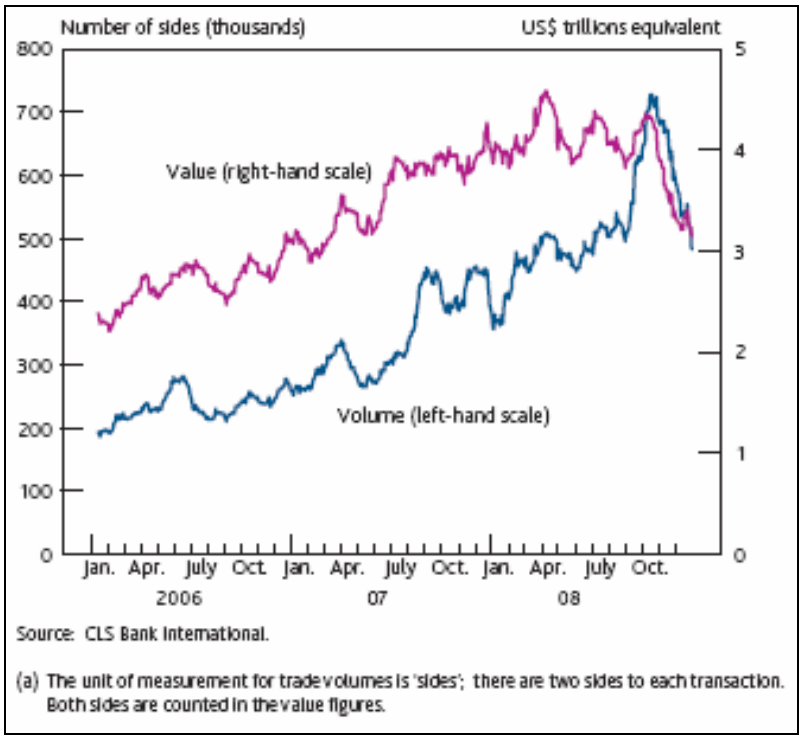
Chart 7: Long-run capital levels for US commercial banks, 1840-1993



Source: Berger, A, Herring, R and Szegö, G (1995), 'The role of capital in financial institutions', *Journal of Banking and Finance*, pages 393–430.

(a) Equity as a percentage of assets (ratio of aggregate dollar value of bank book equity to aggregate dollar value of bank book assets).
(b) National Banking Act 1863.
(c) Creation of Federal Reserve 1914.
(d) Creation of Federal Deposit Insurance Corporation 1933.
(e) Implementation of Basel risk-based capital requirements 1990.

Chart 8: Daily volumes and values settled in CLS



Source: CLS Bank International.

(a) The unit of measurement for trade volumes is 'sides'; there are two sides to each transaction. Both sides are counted in the value figures.

Chart 9: CDS premia and network uncertainty – pre-crisis

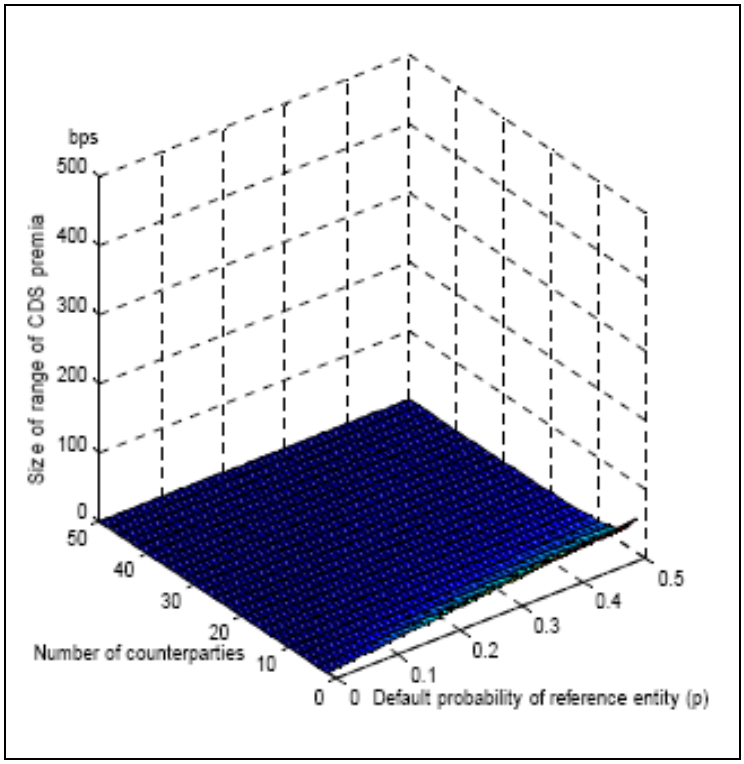


Chart 10: CDS premia and network uncertainty – in-crisis

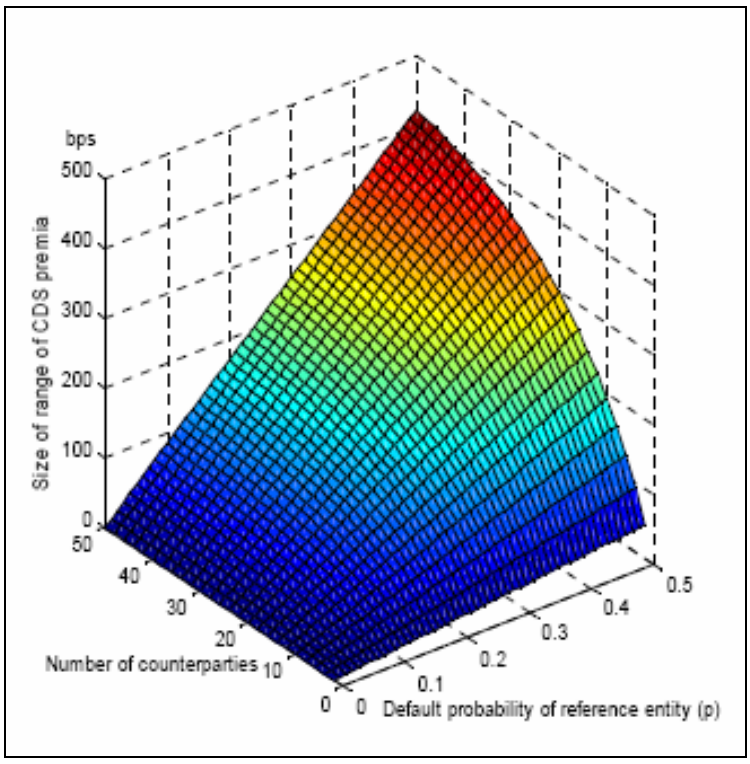
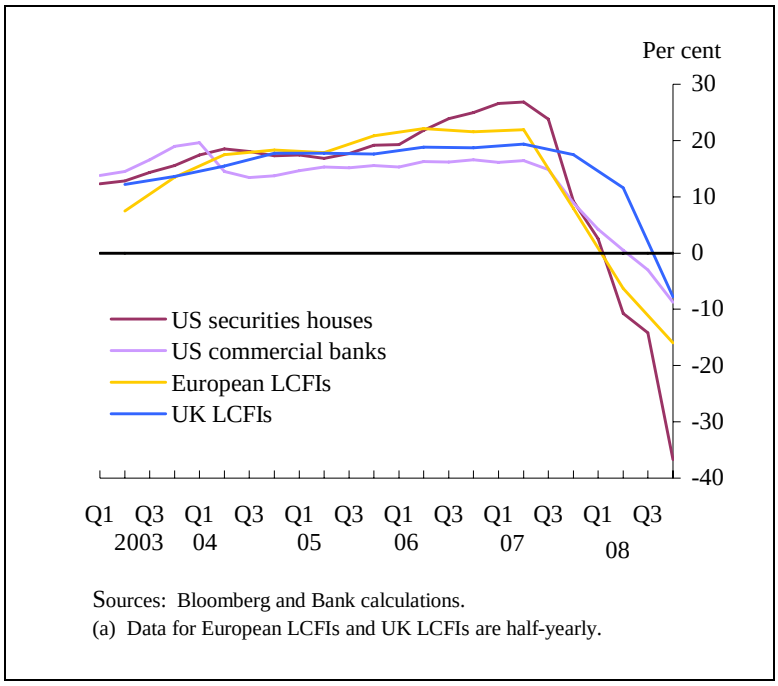
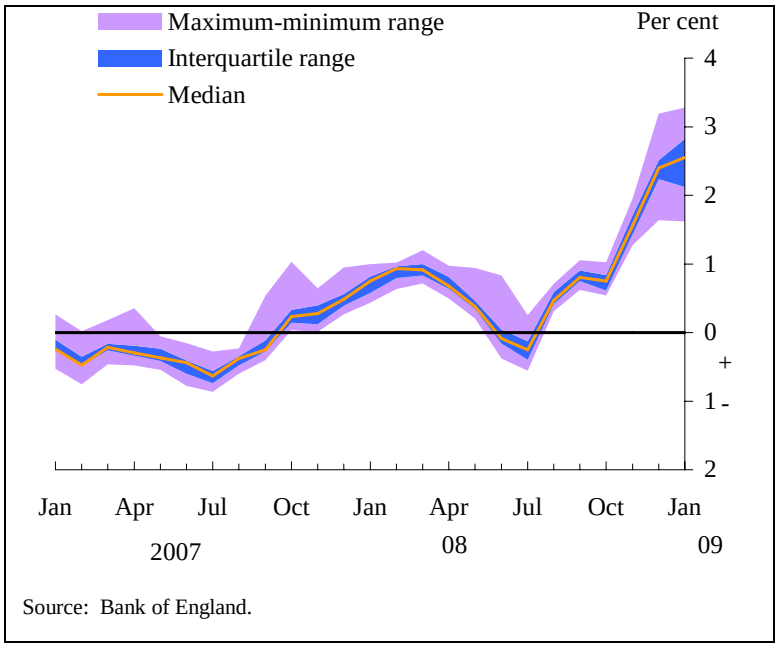


Chart 11: LCFI return on common equity



Sources: Bloomberg and Bank calculations.
(a) Data for European LCFIs and UK LCFIs are half-yearly.

Chart 12: Spreads on new mortgage lending by the major UK banks



Source: Bank of England.