Andrew G Haldane: Credit is trust

Speech by Mr Andrew G Haldane, Executive Director, Financial Stability, Bank of England, at the Association of Corporate Treasurers, Leeds, 14 September 2009.

I would like to thank Paul Fullerton, Simon Hall and Salina Ladha for help in the preparation of this speech.

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It is good to be back in Yorkshire. I say back because I grew up around 10 miles north of here. When I left over 20 years ago, Leeds looked and felt very different to today. Nowhere is the contrast greater than in the financial sector. In 1995, almost 74,000 people were employed in financial and related business services, accounting for around 20% of employment in Leeds. By 2009 this had risen to over 116,000, or around 30% of employment. Today, Leeds has a legitimate claim to be the UK's second largest financial centre.

A short history of banking in Yorkshire

The foundations for this success were laid much earlier. The history of banking in Yorkshire dates back over 250 years.[1] Pease and Co of Hull, established in 1754, are thought to be Yorkshire's oldest private bank. In the same decade, banks were founded in Leeds and Bradford. By the end of the 18th century, Yorkshire had a well-established network of over 40 banks in around 16 regional towns and cities.

In the first two decades of the 19th century, private banking in Yorkshire continued to thrive, spreading to around 30 towns and cities. The financial crisis of 1825 brought an end to this rapid growth. The crisis itself was interesting for its parallels with today. It was sourced in sub-prime lending in (in this case South) America. As fears of loan losses rose, runs began on banks throughout England, with more than a dozen institutions failing in Yorkshire alone.

The crisis brought reform of the banking industry in the form of the Joint Stock Banking Act of 1826. This removed the Bank of England's monopoly on joint stock banking. This had long been a bone of contention among country banks, not least in Yorkshire. The Bank of England itself opened its first branch in Yorkshire – here in Leeds, in fact – the following year in 1827. This was acknowledgement of Leeds' emerging importance as a financial centre. Yet the reception it received was, to say the least, somewhat mixed.

Local newspapers and businessmen attacked the Bank's attempt to spread its "pestilential branches" into the regions.[2] Bank of England notes were shunned by local shopkeepers. The landlady of the *Esk Inn* near Whitby did so with the words:

> "I'll ha' nought to do with them things, I know nought about them; now if it had been a Simpson I would ha' changed it with pleasure"[3]

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1 W.C.E Hartley (1975), "Banking in Yorkshire", *Dalesman Books*. The author completed this work while a Houblon-Norman fellow at the Bank of England.

2 Quoting Joseph Brook, a prominent Huddersfield banker, at a meeting of the Huddersfield Banking Corporation in January 1828.

3 Hartley (*op.cit.*). A "Simpson" was a note offered by local bank Simpson, Chapman and Co of Whitby. Through a sequence of mergers, this subsequently became part of what is today Barclays Bank.

It is easy to imagine, though probably impossible to print, what she might have made of Quantitative Easing.

In the period since, banking and finance in Yorkshire have grown steadily and successfully. Among the success stories would be the Yorkshire Penny Bank. This was founded in 1859 in Halifax as a means of saving for the working classes. In 1874, its first School Transfer Department was opened to encourage saving by school children. "Take care of the Pence and the Pounds will take care of themselves" intoned the bank's posters.

Such was the success of the school scheme that, by the end of the nineteenth century, the majority of schoolchildren in Yorkshire had a savings account. The scheme aimed to educate children from an early age on the benefits of thrift and financial planning. And having been nurtured early, the relationship between bank and customer often lasted a lifetime. In 1959, the Yorkshire Penny Bank became Yorkshire Bank which today remains one of the UK's most successful medium-sized banks.

The mutual or building society sector's roots in Yorkshire are just as deep.[4] Although the first societies appeared in the Midlands in around 1775, within a decade Yorkshire had established its first society, the Hill House Bank Building Club in 1785. By the end of the century, numbers had swelled to around 50, mostly in the Midlands, Lancashire and Yorkshire.

The early mutuals pooled savings to buy property for members and terminated once all members' housing needs were satisfied – so-called "terminating societies". In 1844, "permanent societies" were permitted, which allowed for a revolving set of both savers and borrowers. But the mutuality principle remained – "to enable a working man to secure himself in the course of a few years a dwelling-house as his own freehold property, as a home for himself and family."[5]

Numbers of mutuals grew rapidly during the 19th century, reaching around 850 by 1850 and over 1500 by 1875, with almost 100 in Yorkshire alone. Here in Leeds, the Leeds and Holbeck Permanent Building Society was founded in 1875 and, having been renamed Leeds Building Society in 2005, it remains in the top 10 building societies by size nationally. Consolidation and, latterly, demutualization have reduced numbers over the past few decades. Today, there are only a handful of independent, indigenous mutuals in the region. But they remain some of the strongest in the country.

The success of Yorkshire's financial sector over this lengthy period is no fluke. A reading of history reveals the same successful recipe being repeated. An awareness of, and responsiveness to, the needs of the customer, whether saver or borrower. A focus on long-term relationship-building, often starting from the earliest age. A recognition of the benefits of mutualising both risks and returns. In short, the importance of banks being built, first and foremost, on *trust*.

The crisis of trust

From the past, then, to the present. A year ago almost to the day, the investment bank Lehman Brothers filed for bankruptcy in the United States. Activity across the globe, financial and non-financial, froze. Recently, there are indications of some thawing. But a year on, many economies around the world remain mired in recession. What explains the severity of this crisis and how much longer can it be expected to last?

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[4] See E.J. Cleary (1965), "The Building Society Movement", *Elek Books*. See also S.J. Price (1958), "Building Societies, their origin and history", *Franey and Company*.

[5] S.J. Price (1958), "Building Societies: Their Origin and History", *Franey and Company*.

The words "credit crunch" contain the seeds of an explanation. In Latin, credit means *trust*. So credit crunch is, in essence, a breakdown in trust. Between different parties at different times, that loss of trust has been the root cause of the devastating impact felt globally since the credit crunch began. It also explains why the road to recovery in credit, and thus in the real economy, may be long and winding. In essence, events of the past two years can be re-told as a story of the progressive breakdown in trust.

The proximate cause of the crisis was a breakdown of trust between *banks and households*, specifically sub-prime mortgage-holders in the United States. The upshot was a loss of credit, and in many cases the homes, of these borrowers from 2006 onwards. Repossession rates on US mortgages have more than tripled in the past two years (Chart 1). UK arrears and default rates, although lower, are rising. Some borrowers are now rationed out of the mortgage market. In July 2007, there were around 9500 sub-prime mortgage products being advertised in the UK. Today, there are virtually none (Chart 2).

As losses on these mortgages and other toxic assets accumulated, trust among *banks* was impaired. This saw a seizing-up of inter-bank money markets from the second half of 2007 onwards. Before the crisis, banks required about 10 basis points of compensation for making a three-month loan to one another (Chart 3). By September 2007, that compensation premium had risen tenfold to around 100 basis points. By September 2008, it had risen more than thirty-fold from pre-crisis levels. It has since fallen back to around 35 basis points. These persistent funding pressures have constrained banks' ability to lend to the real economy.

Damaged by losses on assets and constrained by funding costs, questions began to be raised during 2008 about banks' future profitability and, in some cases, viability. The equity prices of banks tumbled, falling 86% on average for the major UK banks between February 2007 and March this year (Chart 4). In money terms, that is a loss of market capitalisation of around £300bn, equivalent to 20% of annual UK GDP. Underlying these price falls was a generalised loss of trust between *banks and investors* in banks, such as sovereign wealth funds and mutual funds.

What explained this wholesale loss of trust? In the run-up to the crisis, banks' business models were increasingly predicated on making loans for onward sale. Loans became tradable securities and long-term relationships gave way to short-term transactions. The perils of this practice were well understood by Michael Marks, founder of Marks and Spencer and of course one of the region's greatest-ever entrepreneurs: "You either make things or you sell them. Don't try both".

Banks tried both, making loans with an eye to subsequently selling them. This had unintended, but in fact entirely predictable, consequences. Without skin in the game, banks' due diligence became slipshod. The quality of tradable loans fell as their quantity rose.

Investors in these securities were not as canny as the landlady of the *Esk Inn*: they purchased them in size even though "they knew nought about them". By the time the penny had dropped for these investors, the pounds had not taken care of themselves. Global losses on these securitised assets are now believed to lie anywhere up to £3 trillion.[6] As losses accumulated, trust in these securities was undermined and with it trust in the banks issuing them.

As credit was cut, trust in the viability of some non-financial companies was questioned. Corporate distress began to rise internationally during the course of 2008. And as corporate distress rose, in particular after the failure of Lehman Brothers, distrust between *companies* mounted. The stream of trade credit extended between firms dried to a trickle at the end 2008 and in the first part of 2009. At that time, a survey by the Bank's regional agents

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[6] For example, Bank of England *Financial Stability Report*, June 2009.

reported that around a quarter of contacts had had to turn down potentially profitable orders as a result of tighter trade credit.

This progressive hardening of the credit arteries also had dramatic effects between *countries*. Cross-border flows of credit have reversed dramatically in the past year. "Home bias" by investors – a lack of trust in foreign investments – has returned with a vengeance. Cross-border lending by international banks grew by 20% per year between 2003 and 2007. In 2008, it fell 5% (Chart 5). This has had adverse effects on UK companies, around a third of whose borrowing comes from foreign lenders.

Through these successive waves, the world financial system found itself with almost every link in the credit chain – in the chain of trust – having been weakened or broken. That is evident in surveys of the public's trust in industry: banking and finance are firmly rooted to the foot of the league table of trust, in the UK and internationally (Chart 6). That loss of trust is mirrored in aggregate bank lending in the UK, in particular to companies, where annual growth has fallen from a peak of 23% in March 2008 to around zero now (Chart 7). And this has in turn been reflected in the largest and most synchronous global economic slowdown since the Great Depression.

Confidence and credit

So how is trust, and thereby credit, to be restored? To date, the answer has been to rely on the one sector whose credit has not been seriously questioned – governments and central banks. There has been large-scale provision of government and central bank credit over the past two years in an attempt to ease pressures and shore up breaks in the private sector credit chain.

These interventions have been unprecedented in size during peacetime. The total potentially on the table is in excess of $14 trillion.[7] That is roughly $2000 for every man, woman and child on the planet. Half of the world's 20 largest banks have needed direct government support. Central bank balance sheets in the major financial centres, including in the UK, have more than doubled in size. And deposit insurance schemes have been extended in at least 40 countries around the world.

Extending public sector credit on this scale relies on the deep pockets and prudence of our grandchildren. It can be no more than a stop-gap – a temporary bridge – until private sector trust can be restored. So far, the bridge has served its purpose. There are signs over recent months from surveys that confidence is returning to banks, non-financial companies and consumers. And there have been some signs of a turnaround in the housing, equity and some debt markets.

It has been said that every recession in history has been associated with a collapse in confidence.[8] This time's was plainly no exception. So with confidence turning can we anticipate an imminent return of credit to the economy?

Rising confidence among firms and consumers is a necessary condition for recovery. But it is questionable whether it is sufficient. That is because confidence and trust are subtly different concepts.[9] Confidence derives from observable, authoritative proof. At the time of the failure of Lehman Brothers, people struggled to make sense of the state of the economy and financial system. Without a compass, they lost their financial bearings. Lacking authoritative

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[7] Bank of England *Financial Stability Report*, June 2009.

[8] "Animal Spirits", George Akerlof and Robert J Shiller (2009), *Princeton University Press*.

[9] For example, see "Restoring Confidence and Trust in UK PLC", *Henley Business School* (2009).

proof, confidence collapsed. As the banking system has since stabilised, people's bearings have returned and with them confidence.

Trust is an altogether different animal. It is based on beliefs, not observable proofs. It is grounded in perceptions rather than evidence. It is as much a psychological state as a financial one.[10] A clean balance sheet might instil confidence, but it need not repair trust. Because it is a moral judgement, repairing trust can be a slow and painstaking business. Moral compasses take rather longer to self-correct than magnetic ones. This has implications for the path of recovery in the period ahead.

Historically, credit has tended to lag the recovery in output in the majority of recessions, especially financial recessions. During the previous three major recessions in the UK – in the 1970s, 1980s and 1990s – credit to business recovered slowly and in some cases only several years after the recovery in activity (Charts 8, 9 and 10). This is consistent with trust between financial institutions and their customers being slower to recover than confidence more generally.

Moreover, unlike the situation today, earlier recessions in the UK were not primarily the result of financial factors. International evidence suggests that financial recessions have tended on average to be both costlier and lengthier.[11] Normal recessions have been associated with a recovery in output to its previous peak after around 3 ½ quarters. Recovery to peak output following financial recessions has on average taken around 5 ½ quarters (Chart 11).

Like its predecessors, lack of confidence may have "caused" this time's recession. But it is lack of trust – and hence credit – that may shape the recovery. Based on past evidence, as the Governor has noted recently, we might anticipate a protracted period of repair.

Repairing trust – the low road to reform

So what might be needed, beyond time, to repair trust in the financial system? A raft of reforms to the financial system, nationally and internationally, is currently being assembled. These measures will aim to strengthen banks' financial resources, risk management practices and governance. They are about bringing regulatory rules into the 21st century.

This is the *high* road to reform – for example, higher buffers of capital and liquidity and higher standards of risk management. If successful, these reforms will help cleanse bank balance sheets. It is an open question, however, whether these efforts will be sufficient to restore public trust in the financial system.

One reason why regulation might not be the whole answer is that trust in financial regulation is itself one of the casualties of crisis. Regulation is seen by some as part of the problem, not the solution. More generally, in repairing public trust, it would be preferable if banks were seen to be initiating root and branch reform themselves, rather than having it thrust upon them by regulators.

This would be the *low* road to reform. Low because it would not require any new or complex regulatory apparatus. Low because it would not need international negotiation or agreement on the contractual fineprint. Instead, what it would require is a self-generated sea-change in the structure and strategy of banking.

So what changes in structure and strategy might be desirable? Without suggesting definitive answers, let me discuss three areas where further debate might be useful: banks' *size* in

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[10] David Tuckett provides a fascinating account of the crisis and its aftermath using psychological theories and evidence ("Addressing the Psychology of Financial Markets", *Institute for Public Policy Research*, May 2009).

[11] "Is the US Sub-Prime Crisis So Different? An International Comparison", Carmen Reinhart and Kenneth Rogoff (2008), *NBER Working Paper No.13761.*

relation to the services they provide; banks' *strategy* in relation to their resilience; and banks' *governance* in relation to the incentives this creates.

- ***Structure – size versus service provision***

Economies of scale typically arise in the production of goods and services which are homogenous and replicable. Henry Ford applied this principle to car manufacture through his Ford Motor Company, established almost a century ago. It was a success. That model has since served many industries well.

But manufacturing loans is not the same as manufacturing cars. Loans are neither homogenous nor replicable. Making loans relies on bespoke, customer-specific information. This information is not obtained by computer algorithm or credit rating agency but through a banking relationship, ideally a long-term one. Despite the advent of social networking, economies of scale are not something we typically associate with long-term relationships.

So the economics of banking do not suggest that bigger need be better. Indeed, if large-scale processing of loans risks economising on the collection of information, there might even be *dis*economies of scale in banking. The present crisis provides a case study. The desire to make loans a tradable commodity led to a loss of information, as transactions replaced relationships and quantity trumped quality. Within the space of a decade, banks went from monogamy to speed-dating.

Evidence from a range of countries paints a revealing picture. There is not a scrap of evidence of economies of scale or scope in banking – of bigger or broader being better – beyond a low size threshold.[12] At least during this crisis, big banks have if anything been found to be less stable than their smaller counterparts, requiring on average larger-scale support.[13] It could be argued that big business needs big banks to supply their needs. But this is not an argument that big businesses themselves endorse, at least according to a recent survey by the Association of Corporate Treasurers.[14]

Take Grameen Bank – not a household name in the UK, I realise. This grew out of a micro-finance project in Bangladesh which began in 1976.[15] Grameen operates as a set of local credit cooperatives, often comprising as few as five members. The bank's relationship with its borrowers is bound not by legal contract but by trust. Like the Yorkshire Penny Bank a century earlier, it aims to encourage saving by the poor and supports the education of the children of borrowers and savers.

In some respects, Grameen Bank is about as basic and small-scale a set of banking arrangements as it is possible to conceive. But its success is only too clear. From the most modest of beginnings, Grameen Bank now operates in over 40 countries worldwide, with over 2000 branches and over 7.5 million borrowers. Grameen is a local bank gone global.

Henry Ford grew an empire on scale economies, centralisation and replication. For the Ford Motor Company, bigger was better. At around the same time, Alfred P Sloan of General Motors was following a different business model. Size still mattered. But production was

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[12] See A. Saunders (1996), "Financial Institutions Management: A Modern Perspective", *Irwin Professional Publishing.* Also see D. Amel, C. Barnes, F. Panetta and C. Salleo (2004), "Consolidation and efficiency in the financial sector: A review of the international evidence", *Journal of Banking & Finance Volume 28, Issue 10.*

[13] Haldane (2009), "Small Lessons From a Big Crisis". See http://www.bankofengland.co.uk/publications/speeches/2009/speech397.pdf

[14] The Association of Corporate Treasurers (2009), "Comments in response to *Turner Review: a regulatory response to the global banking crisis and the accompanying FSA discussion paper DP 09/02 – A regulatory response to the global banking crisis*".

[15] David Bornstein (1996), "The Price of a Dream: The Story of the Grameen Bank", *Oxford University Press.*

decentralised and specialised. The focus was on customer needs supported by some of the first-ever market research on their tastes. In the end, it was Sloan and General Motors whose strategy was emulated around the world.

In meeting the future needs of the real economy, perhaps there is a case for more "Sloans" and fewer "Fords" in banking. Perhaps there is a case for a strategic focus on the "local" as much as the "global", for more micro-finance and less macro-finance. Perhaps it is time for relationship-banking to make a comeback.

- ***Strategy – diversity versus diversification***

Customers require a basket of banking services. The provision of some of these services is important for the wider economy; they are a quasi-public good. For example, the provision of monetary services – basic banking – has a strong public good element. That is why depositor protection, in the form of deposit insurance, is stipulated by the state in many countries. Lending to households and companies can also be thought to contain a public good element. Other functions performed by banks may provide more limited social benefits, though their private benefit may be significant – for example, proprietary trading in complex instruments.

If scale economies in banking are weak, banking services could probably be equally well provided by either a financial supermarket or a set of specialist banks. These different structures might not, however, be equivalent from a risk perspective. The supermarket model potentially does offer some risk benefits – the benefits of diversification. Profitable business lines can compensate for temporarily non-profitable ones. What is lost on the swings may be regained on the roundabouts.

This is a story about which we have heard much over the past few months, especially among the biggest global banks. In the first half of this year, big losses on the banking book swings have been more than offset by big gains on the trading book roundabouts. Diversification, we were told, was paying dividends – and, indeed, bonuses.

But memories can be deceptively short. Rewind the clock one year. Then, it was trading book losses that were eroding confidence in the banks. This in turn prompted fears about some banks' solvency, aggravating the very recession which is now generating banking book losses. Trading book gains may well be acting as a hedge today. But they are hedging a risk they helped create.

All of this implies that business line diversification can be a double-edged sword. During the upswing, banks enjoyed windfall gains from bets at the race-track. This boosted their buffers. But when those bets turned sour, these same activities put at risk banks' day job – the provision of loan and deposit services to the real economy. 9500 sub-prime mortgage products at the height of the boom might well have been too many. But zero is surely too few.

There is a second important downside to diversification. While it might be sensible for an individual firm to diversify its business lines to reduce its risk, if this same strategy is followed by all banks the end-result may be greater fragility across the whole system. Why? Because in their desire to look different than in the past, banks' business strategies may end up looking identical in the present. The financial system could then become more prone to herd-like upswings and lemming-like downswings.

There is more than a hint of this behaviour during the run-up to crisis. Banking strategies became a whirligig. Building societies transformed themselves into commercial banks. Commercial banks tried their hand at investment banking. Investment banks developed in-house hedge funds through large proprietary trading desks. Hedge funds competed with traditional investment funds. And to complete the circle, these investment funds imported the risk all of the others were shedding. In their desire to diversify, individual banks generated a lack of diversity, and thus resilience, for the financial system as a whole.

So recent crisis experience highlights some of the costs of bundling banking services. Given that, there is an intellectually defensible case for some unbundling of these services. This would reduce the risks of spill-over between privately and socially beneficial banking activities. And it would help prevent banks making individually rational but collectively calamitous strategic choices.

There are plenty of examples from the non-financial world, from genetics to geology, of diversity improving the robustness of systems. The financial system may be no different. The resulting financial landscape would, however, look rather different. There would be greater specialisation and diversity. The shopping experience for a banking customer would be more farmers' market than supermarket.

- ***Governance – stakeholders versus shareholders***

In deciding appropriate corporate governance arrangements, economists have tended to focus on the relationship between shareholders (as principal) and managers (as agent). Principal-agent problems arise when these two parties' incentives are misaligned. Profit-related pay is one means of achieving alignment, with managers remunerated in line with shareholder returns. In addressing one incentive problem, however, this approach may risk worsening two others – between shareholders and depositors on the one hand and between shareholders and the public sector on the other.

Limited liability means that returns to shareholders are capped below at zero, but not above. That provides a natural incentive for owners to gamble, pursuing high risk/high return strategies from which they import the return upside but export the risk downside to depositors or the public sector. During this crisis, the pursuit of those strategies has resulted in the public sector picking up the cheque for the downside in an effort to reduce risks to depositors.

A mutual model of corporate governance gives rise to a rather different set of incentives. Instead of external shareholders, savers and borrowers become the owners, with profits remitted directly to them in the form of higher deposit rates and/or lower borrowing rates. For that reason, measured profit margins appear consistently lower for building societies than for banks.

Unlike in most industries, however, low margins for a mutual are very unlikely to result in shareholder revolt or a missive to management to gear-up or get-out. They are a reflection of corporate governance working for stakeholders, here defined broadly to include depositors and borrowers. In this way, mutuality reduces the scope for misaligned incentives between shareholders and depositors which might otherwise arise in a joint stock bank.

This is not to suggest that mutuality is a panacea. For example, it does not address the potential incentive problem between stakeholders and the public sector. Indeed, it could even potentially worsen this problem as shareholders and depositors are one and the same under mutuality and so must rank equally in the event of a payout from the public purse. Moreover, profit margins in the building society sector are currently under some pressure as a result of low Bank rate and increased competition for prime residential loans. Some building societies have also hit bad loan problems.

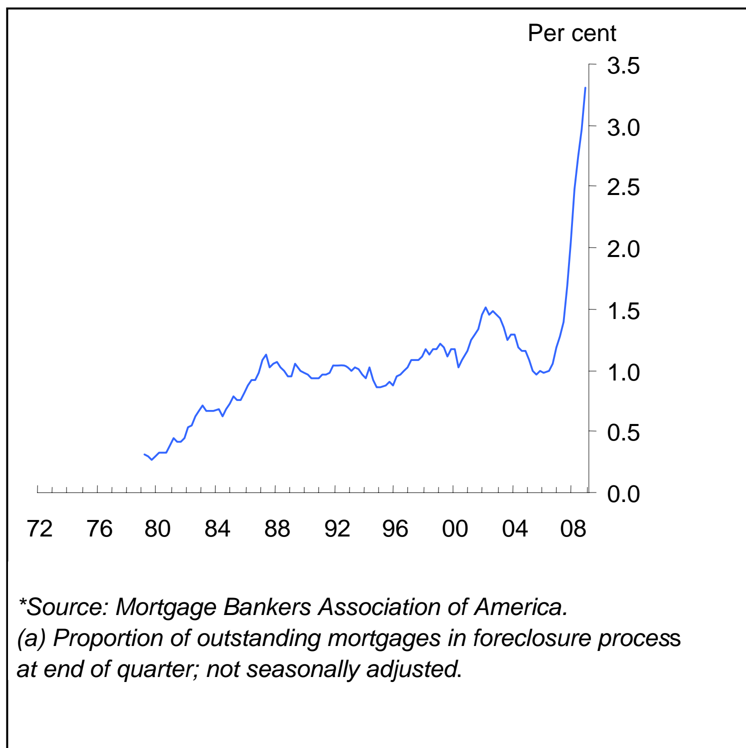
Although painful in the short-term, these margin pressures ought in time to abate. So in the heartland of mutuality, I am happy to say that reports of the death of the building society sector are greatly exaggerated. Indeed, mutuality may do a better job of aligning stakeholder incentives than some alternative forms of corporate governance. It is a depressing but telling fact that, of the demutualised former UK building societies, none is today in independent ownership.

Thrift, mutuality and relationship-building have long underpinned banking in Yorkshire. These principles went missing in the run-up to the present crisis. The costs of that vanishing act are now all too apparent. In rebuilding the financial system, to create one which is both stable

and better able to meet the needs of the real economy, these principles need to be rediscovered. They offer a tried and tested – indeed, trusted – roadmap for the period ahead.

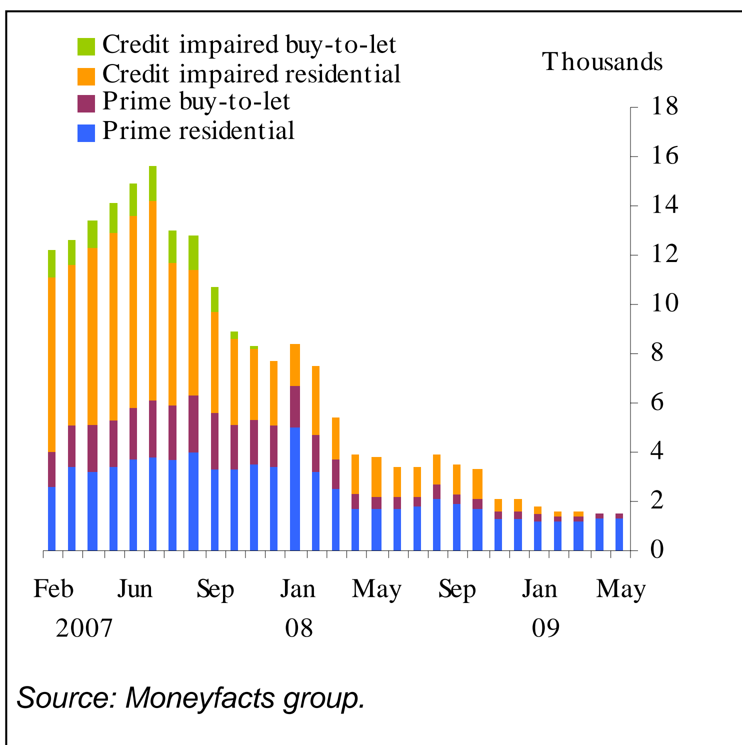
Charts

Chart 1: US mortgage foreclosure inventory rates [a]



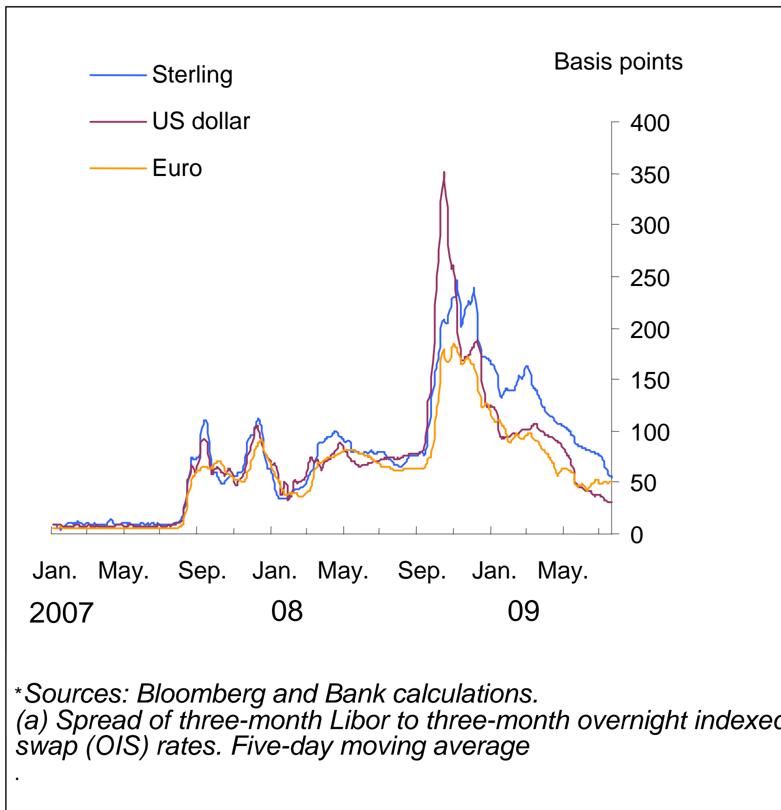
**Source: Mortgage Bankers Association of America.*
(a) Proportion of outstanding mortgages in foreclosure process at end of quarter; not seasonally adjusted.

Chart 2: Number of mortgage products advertised



Source: Moneyfacts group.

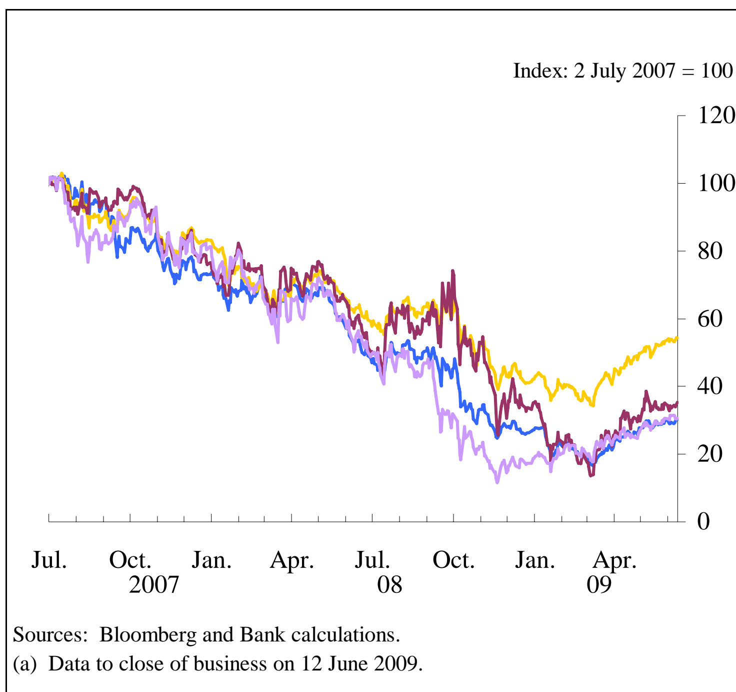
Chart 3: Three-month inter-bank spreads [(a)]



Sources: *Bloomberg and Bank calculations.*

(a) Spread of three-month Libor to three-month overnight indexed swap (OIS) rates. Five-day moving average

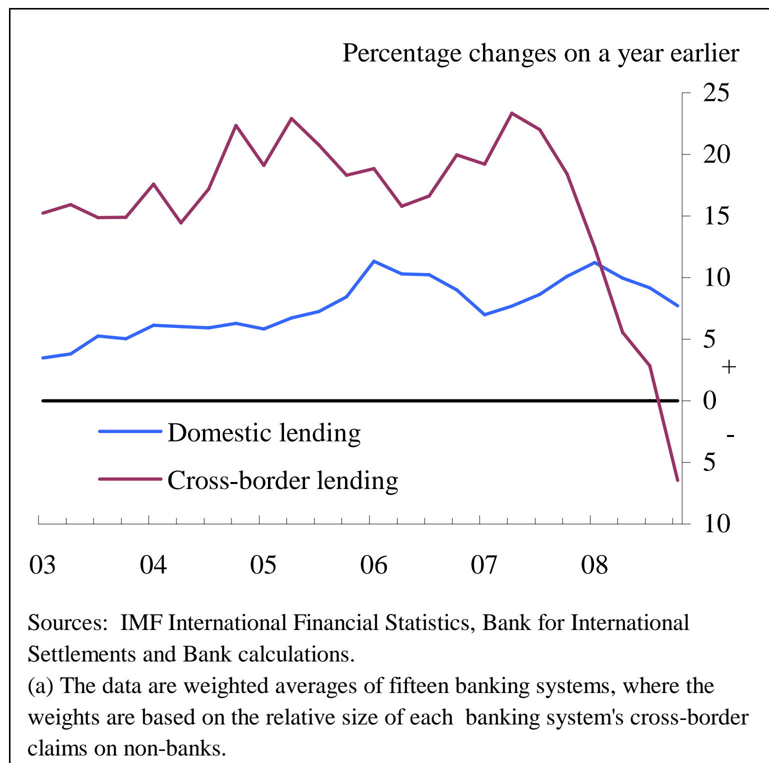
Chart 4: Major UK banks' and LCFIs' equity prices



Sources: Bloomberg and Bank calculations.

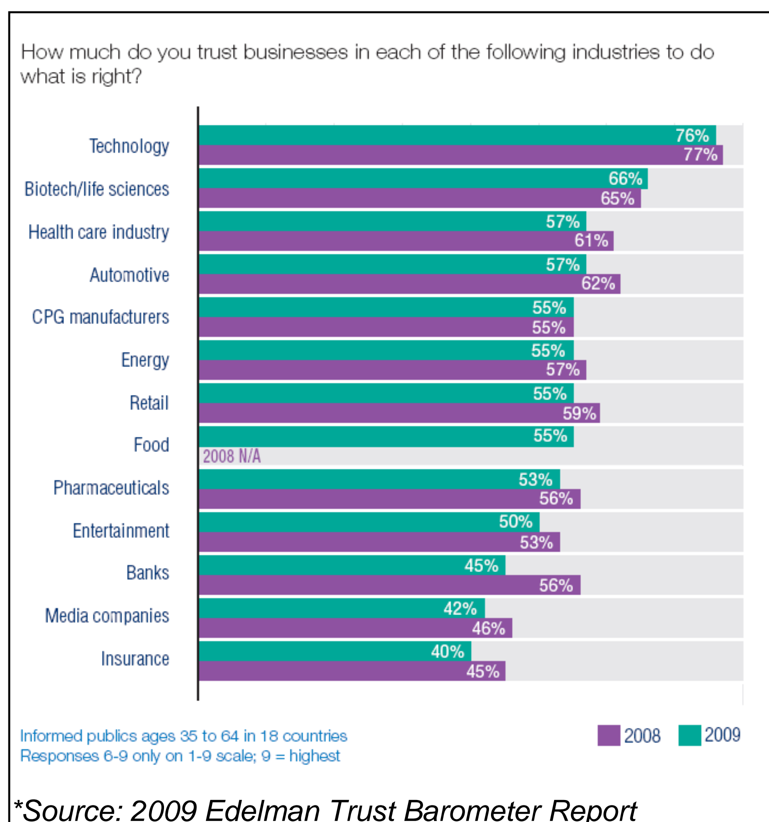
(a) Data to close of business on 12 June 2009.

Chart 5: BIS banks' cross-border lending [(a)]



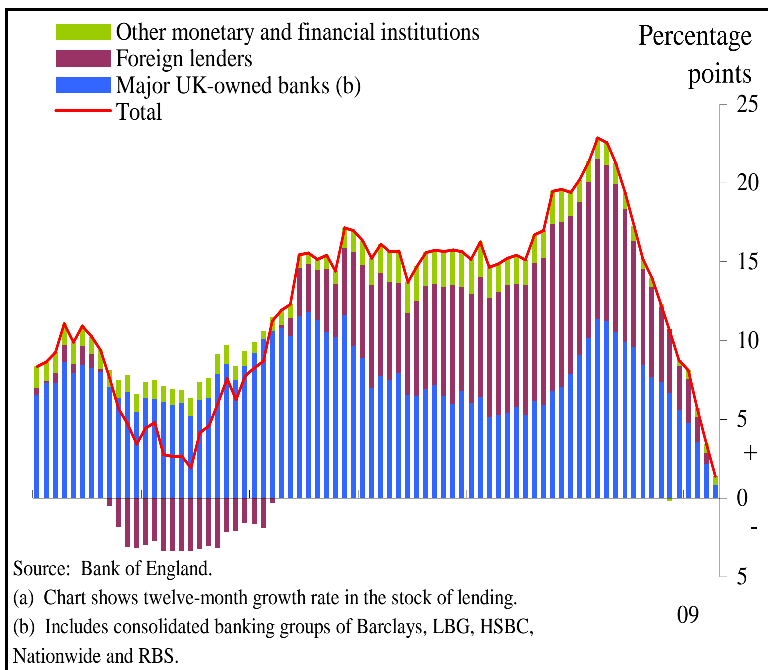
Sources: IMF International Financial Statistics, Bank for International Settlements and Bank calculations.
(a) The data are weighted averages of fifteen banking systems, where the weights are based on the relative size of each banking system's cross-border claims on non-banks.

Chart 6: Trust in different industries



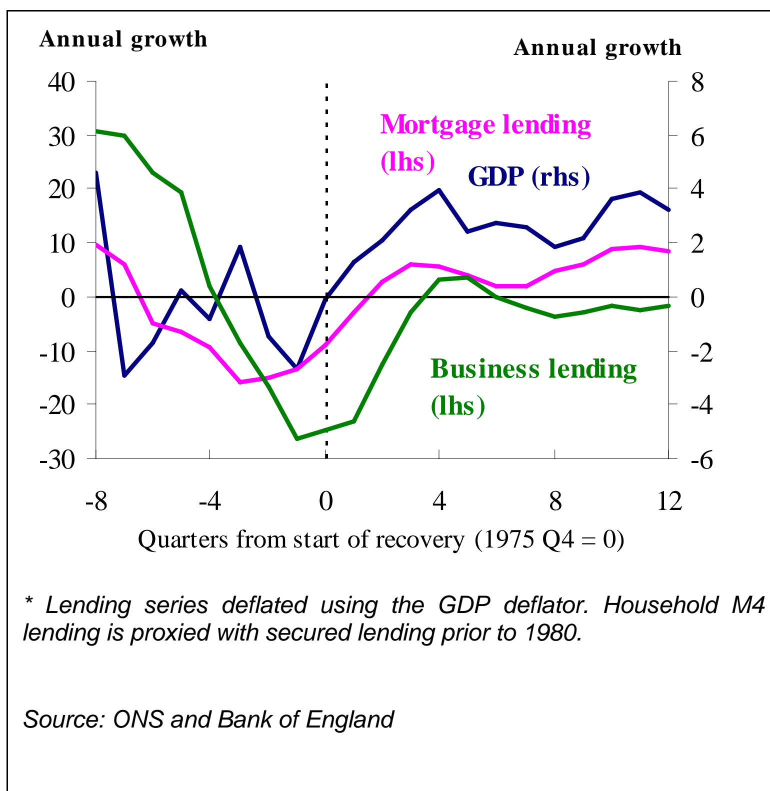
**Source: 2009 Edelman Trust Barometer Report*

Chart 7: Contributions to annual lending growth to UK non-financial companies



Source: Bank of England.
(a) Chart shows twelve-month growth rate in the stock of lending.
(b) Includes consolidated banking groups of Barclays, LBG, HSBC, Nationwide and RBS.

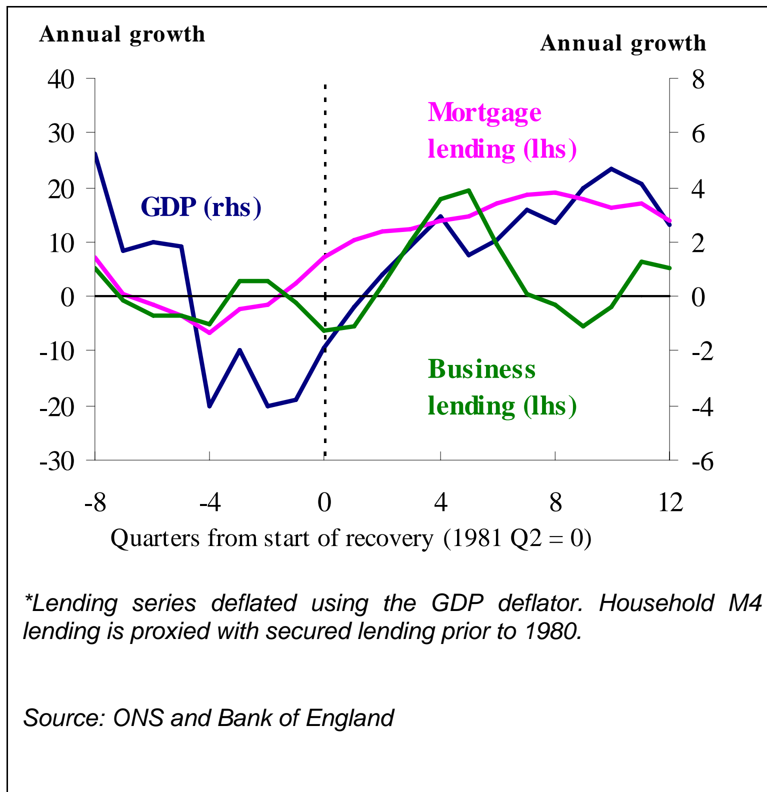
Chart 8: 1970s – Real GDP and real lending



** Lending series deflated using the GDP deflator. Household M4 lending is proxied with secured lending prior to 1980.*

Source: ONS and Bank of England

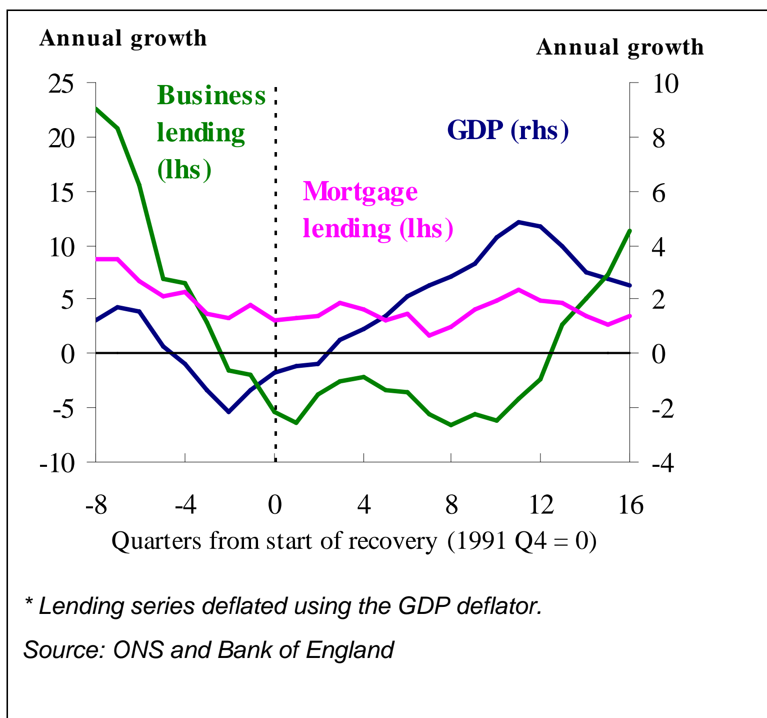
Chart 9: 1980s – Real GDP and real lending



**Lending series deflated using the GDP deflator. Household M4 lending is proxied with secured lending prior to 1980.*

Source: ONS and Bank of England

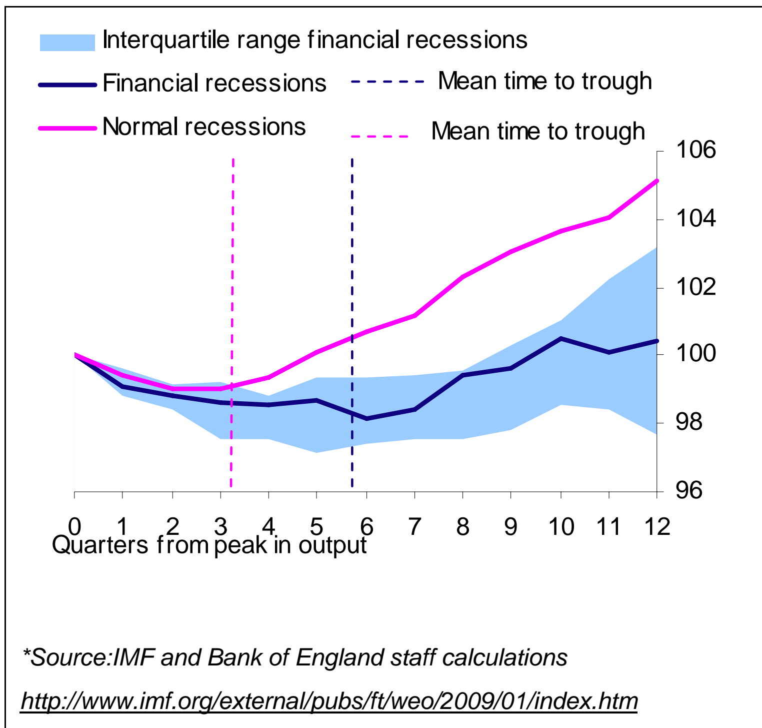
Chart 10: 1990s – Real GDP and real lending



** Lending series deflated using the GDP deflator.*

Source: ONS and Bank of England

Chart 11: Recessions and recoveries – median paths



**Source:IMF and Bank of England staff calculations*

http://www.imf.org/external/pubs/ft/weo/2009/01/index.htm