

THE FUTURE OF FINANCE

And the theory that underpins it

1 What do banks do? Why do credit booms and busts occur and what can public policy do about it?

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Chapter 1

What do banks do? Why do credit booms and busts occur and what can public policy do about it?

Adair Turner

Over the last 30 to 40 years the role of finance within developed economies has grown dramatically: debt to GDP ratios have increased, trading volumes exploded, and financial products have become more complex. Until the recent crisis this growing scale and complexity were believed to enhance both efficiency and stability. That assumption was wrong. To understand why, we need to recognise specific features of financial markets, credit contracts, and fractional reserve banks. The recent crisis was particularly severe because of the interaction between the specific characteristics of maturity transforming banks and securitised credit markets. The regulatory response needs to distinguish the different economic functions of different categories of credit: only a fraction of credit extension relates to capital formation processes. The response should combine much higher bank capital requirements than pre-crisis, liquidity policies which reduce aggregate maturity transformation, and counter-cyclical macro prudential tools possibly deployed on a sectorally specific basis.

Introduction and Summary

In 2007 to 2008 the world faced a huge financial crisis, which has resulted in major losses in wealth and employment and which has imposed great burdens on the public finances of developed countries. The latest stage of the crisis – its mutation into sovereign debt concerns – is still ongoing. We still need to manage out of the crisis; and we need to learn the lessons of what went wrong, so that we can reduce the probability and severity of future crisis. To do that effectively, we need to ask fundamental questions about the optimal size and functions of the financial system and about its value added within the economy, and about whether and under what conditions the financial system tends to generate economic stability or instability. We need to debate what the “future of finance” should be. That is the purpose of the essays combined in this book.

The recent past of finance, the last 20 to 30 years, has been striking, with three important developments: (i) first, a very major growth in the scale of financial activities relative to the real economy; (ii) second, an explosion of the complexity of financial products and services, in particular linked to the development of securitised credit and of credit and other derivatives; (iii) and third, a rise in intellectual confidence that this

growth in scale and complexity was adding economic value, making the global economy both more efficient and less risky.

It is now clear that the third assumption was quite wrong: we need to understand why.

Many aspects of what went wrong are obvious and have been set out in numerous official and academic reports. Risk management practices were often poor, relying on over-simplistic mathematical models; governance arrangements – the role of boards, risk committees and risk managers – were often inadequate, as sometimes was supervision by regulatory authorities. Rating agencies were beset by conflicts of interest. Complex structured products were sometimes sold to investors who failed to understand the embedded options; and in derivatives markets, huge counterparty exposures appeared, creating severe risks of interconnected failure. The policy response now being designed at European and global level needs to address, and is addressing, these clear deficiencies.

But even if these deficiencies are addressed, the future financial system could remain dangerously unstable. Regulatory reform needs to address more fundamental issues. To do that effectively it must recognise that financial markets and systems have highly specific characteristics which distinguish them from other markets within a capitalist economy. In particular: (i) financial markets are different because inherently susceptible to de-stabilising divergences from equilibrium values; (ii) credit contracts create highly specific risks which increase economic volatility, and different categories of credit perform different functions and create different risks¹; (iii) banks are highly specific institutions which introduced their own specific risks into the economy. Understanding these distinctive characteristics is central to understanding the potential dynamics of modern market economies; too much of modern economics has ignored them almost completely, treating the financial system as neutral in its macro-economic effect.

This chapter considers their implications. Its key conclusions are that:

- (i) There is no clear evidence that the growth in the scale and complexity of the financial system in the rich developed world over the last 20 to 30 years has driven increased growth or stability, and it is possible for financial activity to extract rents from the real economy rather than to deliver economy value. Financial innovation and deepening may in some ways and under some circumstances foster economic

¹ Three features of credit contracts carry important implications for cyclical tendencies within a market economy: specificity of tenor; specificity of nominal value; and the rigidity and irreversibility of default and bankruptcy. See Adair Turner *Something Old and Something New: Novel and Familiar Drivers of the Latest Crisis*, lecture to the European Association of Banking and Financial History (May 2010) for a discussion of these features.

value creation, but that needs to be illustrated at the level of specific effects: it cannot be asserted a priori or on the basis of top level analysis.

- (ii) The most fundamental development in several developed economies in the last 40 to 50 years has been the growth in private sector debt to GDP, and it is essential to understand the role which debt/credit plays within our economy. In many current discussions about the potential impact of higher capital requirements on growth, the focus is almost exclusively on credit extension as a means to intermediate household savings into corporate investment, with a direct potential link between credit extension and GDP growth. But in many developed economies the majority of credit extension plays no such role and instead either (i) supports consumption smoothing across the life-cycle, in particular through residential mortgages; (ii) supports leveraged “asset play” investments in already existing assets, in particular in commercial real estate. Lending against property – residential or commercial – dominates credit extension and is inherently susceptible to self-reinforcing cycles of credit supply and asset price.
- (iii) Fractional reserve banks facilitate all categories of credit extension through maturity transformation, which in turn creates significant risks. There is a reasonable case that financial deepening via bank credit extension plays a growth-enhancing role in the early and mid stages of economic development, but it does not follow that further financial deepening (i.e. a growing level of private sector credit and bank money relative to GDP) is limitlessly value creative. Less maturity transformation in aggregate and a reduced role for bank credit in the economy, compared with that which emerged pre-crisis in several developed economies, may in the long run be optimal.
- (iv) While volatile credit supply in part derives specifically from the existence of banks, which introduce both leverage and maturity transformation into the financial system, the development of securitised credit and mark-to-market accounting has also contributed to that volatility, increasing the extent to which credit pricing and the quantity of credit supplied are driven by self-referential assessments of credit risk derived from the market price of credit.
- (v) The essential reason why the 2007 – 2008 crisis was so extreme was the interaction of the specific features of bank credit and the specific features of securitised credit.
- (vi) Looking beyond banking and credit supply to the more general development of trading activity in non-credit derivatives, foreign exchange and equities, a pragmatic approach to the economic value of liquid traded markets should replace the axiomatic belief in the value of increased liquidity which characterised the pre-crisis years. Market liquidity delivers economic value up to a point, but not limitlessly. Liquid FX markets play a role in lubricating trade and capital flows, but can overshoot equilibrium values. Equity markets may be reasonably efficient at setting relative prices, but are susceptible to huge aggregate overshoots. Volatility in equity markets, however, is less harmful than volatility in debt markets. Market

making can be an economically useful function, but some proprietary trading (e.g. many FX carry trades) perform no useful economic purpose and can generate instability. The ability of regulators to distinguish useful market-making from destabilising proprietary trading is, however, limited. Conversely, however, it is not nil.

If the essential causes of the crisis lay in the interaction between the specific risky characteristics of banks and of securitised credit markets, the regulatory response must address these fundamental issues.

The implications for policy are that:

- (i) No silver bullet structural reform can be an adequate response.
 - Addressing the “Too Big To Fail” issue is a necessary but not sufficient response. Destabilising volatility of credit supply could arise in a system of multiple small banks.
 - The objective behind the Volcker rule is highly desirable, but a system of completely separate commercial and investment banks could still generate destabilising credit and asset price swings.
 - Narrow banking proposals to separate insured deposit taking from lending activities will fail to address the fundamental drivers of credit and asset price instability.
 - Proposals for replacing banks with 100% equity financed loan funds, while useful in stimulating thinking about radical increases in bank capital requirements, might exacerbate price and valuation driven instability.
- (ii) The most important elements of the regulatory reform instead need to be:
 - Much higher capital requirements across the whole of the banking system, and liquidity requirements which significantly reduce aggregate cross-system maturity transformation in both banks and shadow banks.
 - The development of counter-cyclical macro-prudential tools which can lean against the wind of credit and asset price cycles, and which may need to do so on a sector specific basis.
- (iii) Other elements of reform are appropriate but less fundamental.
 - Improvements in and regulation of remuneration, risk governance and rating agencies practices have a role to play.
 - More effective and intense supervision of individual firms is important.
 - Fiscal policies – levies and taxes – can legitimately raise revenue and can be designed to complement capital and liquidity regulation.

- And a pragmatic attitude towards the value of liquid traded markets implies that constraints on specific products or practices, such as short-selling, may be useful elements in the regulatory tool kit and should not be rejected as axiomatically harmful.

But none of these other policies is as important as higher capital and liquidity standards and the development of a macro-prudential approach; and it is vital that focus on other aspects of the reform does not divert attention from these priorities.

To make these points, this chapter is structured in six sections:

1. First, what a financial system does, and in particular, what banks do: their theoretical value added within the economy.
2. Second, trends in the banking and financial system over the last 50 years, illustrating a dramatic increase in the overall scale of the financial sector, and important changes in the mix of activities performed.
3. Third, a focus on the provision of credit to the real economy: and the relationship between credit, economic growth and human welfare. And an argument in favour of new macro-prudential policy tools, focused directly on the dynamics of credit extension.
4. Fourth, a look at the complex securitisation which developed over the last 15 years. Was it truly valuable? Will it return and do we want it to return? And what policy measures are required to make sure that it plays its appropriate function in the real economy?
5. Fifth, a focus on the provision of market liquidity and on the trading and position-taking activities which support it. How valuable is it? And what policy implications follow if we do not accept that more trading activity is always beneficial in all markets?
6. Sixth, implications for the regulatory reform agenda.

* * *

1. The financial system's value added to the economy

What does the financial system do, and how does it deliver economic value added or welfare benefits? There are many different ways of categorising financial system activities. For the purposes of this chapter, I will start with a fourfold distinction between:

- First, the provision of payment services, both retail and wholesale.
- Second, the provision of pure insurance services, life or general, wholesale and retail, which enable people or businesses to lay off exposure to risks by pooling their exposure with others.
- Third, the creation of markets in spot or short-term futures instruments in, for instance, foreign exchange and commodities.
- Fourth and finally, financial intermediation between providers of funds and users of funds, savers and borrowers, investors and businesses, an intermediation which plays a crucial role in capital allocation within the economy.

Specific products and activities of course span these four categories. A bank current account is a bundled mix of one and four. Most life insurance products bundle elements of two and four. And commodities trading via the futures market can be a form of investment, competing with other categories of investment to which savers might wish to devote their funds. But the conceptual distinctions nevertheless remain valuable.

My focus in this chapter will be almost entirely on category four, with some comments in the final section on category three. It is in these category four activities that the problems arose in the latest crisis: nothing went wrong with the payment system, or with insurance pooling services, or with spot foreign exchange markets. And indeed it is within this category four set of activities that problems have arisen in most past financial crisis and where they are most likely to lie in future.

The function we are focusing on here (Chart 1) is that of linking providers of funds (which can be either households or businesses or other corporate bodies) with users of funds, which again can be either households, businesses or other corporate bodies, or indeed the government. And the claims which exist between the providers and the issuers can take debt or equity (or intermediate) form, and can be a variety of different maturities.

And one function that parts of the financial system perform is simply to help make a match between specific providers of funds and specific users, so that a direct investment can be made. Equity research and underwriting and distribution, for instance, can result in

an individual household or corporate body owning a share of a specific company – similarly for bond research underwriting and distribution. But this match-making function is actually only a small part of what the financial system does. Indeed, the core of what the financial system does is to intermediate **non-matching** providers and users of funds, enabling the pattern of providers’ assets to differ from the pattern of users’ liabilities.

This intermediation of non matching assets and liabilities entails four functions.

- First, a pooling of risks, with each depositor of a bank having an indirect claim on all the mortgages, business loans, or credit card receivables owed to the bank rather than a claim on one specific mortgage or loan.
- Second, maturity transformation via balance sheet intermediation, with banks lending at longer average maturities than they borrow. The clear risks inherent in this transformation are off-set by the equity cushion, but also by the holding of a fractional reserve of highly liquid assets, by liquidity insurance achieved through lines available from other banks and by the central bank lender-of-last-resort function (Chart 2). This maturity transformation function enables, for instance, savers within the household sector to hold short-term deposits, while borrowers within the household sector can borrow on long-term mortgages.
- Third, maturity transformation via the provision of market liquidity, which gives the holder of a contractually long-term asset the option of selling it immediately in a liquid market. The matching process I referred to earlier can result in a company issuing perpetual equity which is bought by a specific investor who intends to hold the equity in perpetuity, taking the dividend stream. But if there is a liquid market in equities that investor does not have to hold the equity perpetually but has the option of selling the equity.²
- Fourth and finally, risk return transformation, the creation of a different mix of debt and equity investment options for savers than arise naturally from the liabilities of the borrowers. Thus what a bank balance sheet essentially does is take a set of debt liabilities from final users and, in the language of securitisation, to ‘tranche’ them, with some investors buying bank equity, some buying bank subordinated debt, some senior debt, and some making deposits (Chart 3). As a result, depositors and senior debt holders hold a debt claim of much lower risk than the average pooled quality of the asset side of the banks’ balance sheet, but also lower return, while equity holders have a higher risk and higher return investment.

² Of course this form of liquidity provision comes with uncertainty as to capital value, while maturity transformation on balance sheet enables the depositor to enjoy both liquidity and (almost, it is hoped) capital certainty. But it is still a form of maturity transformation, giving the fund provider a different set of asset options than is inherent in the maturity of the liabilities faced by fund users.

These four transformation functions can deliver value added to the economy in three different ways (Chart 4).

- The first function, pooling, entails the intermediary allocating capital to end projects. The financial system plays an indirect role in the capital allocation process even when it facilitates and informs direct matched investments – via, for instance, equity research and distribution. But it plays an even more active role in capital allocation when it performs pooling functions, either via asset management or via the pooling of bank debt claims. And it is important that it is done well, since a more efficient allocation of capital will tend to produce a higher level of income for any given level of investment.³
- Second, and within the household sector, functions two and three enable individuals to hold the maturity mix of assets and liabilities which they want with, for instance, savers able to have short-term deposits, while borrowers can have long-term maturity mortgages. This provides assurance of access to liquid assets in the face of either fluctuating consumption or unanticipated income shocks. It enables more extensive smoothing of consumption across the life cycle. And as a result it can deliver direct consumer welfare benefits independent of any impact on aggregate savings rates, investment levels, the efficiency of capital allocation, or economic growth.
- Third, all four functions together enable individual household sector savers to hold a mix of assets (as defined by risk, return and liquidity) which is different from the mix of liabilities owed by business users of funds. This transformation may under some circumstances produce a higher rate of savings, more productive investment and, for a period of time, higher growth.⁴ Thus, for instance, maturity transformation makes possible a term structure of interest rates more favourable to long-term investment than would otherwise pertain, making long-term loans available on better terms. But in general, the impact of transformation of risk/return/and liquidity possibilities will be to produce a level of savings which is **optimal** even if not necessarily higher, i.e. a level of savings which best reflects individual preferences and which thus maximises welfare. Under some circumstances this welfare maximising savings rate might be lower than would pertain in a less developed financial system: underdeveloped financial systems, by constraining financial investment options and life cycle consumption smoothing

³ This financial intermediary function does not perform the whole of the capital allocation process. A significant amount of capital allocation occurs de facto within large firms, which make decisions about the use of retained earnings. But while not performing the whole of the capital allocation process, the financial system plays an important role.

⁴ A higher rate of investment will produce a period of higher growth and a higher level of income at any one time than would otherwise pertain, but not a permanently higher growth rate.

choices, can sometimes constrain individuals to choose savings rates higher than they would choose if a wider set of investment and borrowing options was available.

The first of these benefits, capital allocation, derives from the pooling function. The second and third derive from the risk-return transformation and the maturity transformation processes. Essentially what these do is to increase the range of options for investment in different combinations of risk/return/maturity beyond that which would exist if investors had to invest directly in the individual untransformed liabilities of business or households, or in pools of these untransformed liabilities.

Finally in this description of the theory, it is useful to note that the wave of complex credit securitisation which occurred over the last 15 to 20 years, was not in its economic function entirely new, but rather an intensification of the four financial system transformations described above and an application of those transformation functions to more assets and at a finer level of differentiation. Thus:

- Complex securitisation pooled previously un-pooled assets such as mortgages.
- It transformed the risk/return characteristics of assets by tranching, taking for instance, a set of mortgages with an average untransformed credit rating of A, and manufacturing some AAA securities, some AA, some BBB and some equity.
- It introduced new forms of contractual balance sheet maturity transformation, via Structured Investment Vehicles (SIVs), conduits and mutual funds, which enabled short-term providers of funds to fund longer term credit extensions.⁵
- And it was underpinned by extensive trading in credit securities, providing market liquidity so that the holder of a contractually long credit security could sell it immediately if they wanted.

By doing all this, complex securitisation increased the extent to which assets offered to investors could be tailored to their specific preferences for specific combinations of risk/return and liquidity. As a result, its proponents asserted before the crisis, it must have increased economic efficiency and economic welfare. Whether that argument was valid is considered in Section 4.

⁵ Indeed it also applied the technologies of rotating ‘master trusts’ to achieve maturity transformation in the other direction, creating longer term credit securities out of mortgages whose average expected repayment maturity might (but might not) be relatively short term.

2. Trends in banking, securitisation and trading

Section 1 has considered the functions which a banking and financial system can in principle perform. A striking fact about the last 30 to 40 years of economic history is that the scale on which it performs those functions, the overall size of the financial system relative to the real economy, has dramatically increased. There are several different dimensions to this increase. (Chart 5)

- **Leverage** – measured by debt to GDP – has increased significantly in many countries including the US shown here, with households in particular becoming more indebted, and with a particularly striking increase in **intra-financial** system leverage, claims by one financial firm upon another.
- **Innovation** has driven **complexity**, with a massive development over the last 20 years of complex securitisation and derivatives products.
- And **trading volumes** have increased hugely, relative to underlying real economic variables, with foreign exchange trading increasing for instance from eleven times global trade and long-term investment flows in the 1970's to over 70 times today and with similarly dramatic increases in oil and derivatives trading.

There has thus been an increasingly 'financialisation' of the economy, an increasing role for the financial sector. Financial firms as a result have accounted for an increased share of GDP, of corporate profits, and of stock market capitalisation. And there has been a sharp rise in income differential between many employees in the financial sector and average incomes across the whole of the economy.

This increasing financial intensity reflected in part the globalisation of world trade and capital flows, and the floating exchange rate regimes which followed the breakdown of the Bretton Woods system in the 1970's, but also deliberate policies of domestic financial liberalisation.

A crucial issue is therefore whether this increased financial intensity has delivered value added for the real economy – whether it has improved capital allocation, increased growth, or increased human welfare and choice in ways which do not show up in growth rates. And whether it has made the economy more or less volatile and vulnerable to shocks.

Three observations are striking when we pose that question.

- First is the relatively little attention to that question paid by mainstream economics, with many theories of growth and development, and many models of the economy used by policymakers in finance ministries and central banks, treating the financial system as a neutral pass through. As Alan Taylor and Moritz Shularick note in a recent paper which considers the same issues I will address in this chapter: ‘in the monetarist view of Freidman and Schwartz (1963) and also in the recently dominant neokeynesian synthesis, macroeconomic outcomes are largely independent of the performance of the financial system’.⁶
- Second, however, is that while the recently dominant neoclassical school of economics has often been uninterested in the detailed transmission mechanisms which link actual financial institutions to real economic variables, it has provided strong support for the belief that increased financial activity – financial deepening, innovation, active trading and increased liquidity – must be a broadly positive development. This is because more financial activity helps complete markets. The first fundamental theorem of welfare economics, demonstrated mathematically by Kenneth Arrow and Gerard Debreu, illustrates that a competitive equilibrium is efficient, but only if markets are complete, i.e. if there are markets in which to strike all possible desired contracts, including insurance contracts and investment contracts linking the present and the future, as well as markets for current goods, services and labour.⁷ Therefore, the more that the financial sector provides the transformation functions described in Section 1, the more that innovation allows investors to choose precise combinations of risk, return, and liquidity and the more that trading activity generates market liquidity, the more efficient and welfare-maximising must the economy be.

These theoretical propositions have moreover had a major influence on policy makers. Keynesian famously suggested that ‘practical men, who believe themselves quite exempt from any intellectual influences, are usually the slaves of some defunct economist’. But the bigger danger may be that reasonably intellectual men and women who play key policy making roles can be over-influenced by the predominant conventional wisdom of the current generation of academic economists. Certainly in the UK Financial Services Authority, the idea that greater market liquidity is in almost all cases beneficial, that financial innovation was to be encouraged because it expanded investor and issuer choice, and that regulatory interventions can only be justified if specific market imperfections can be identified, formed key elements in our institutional DNA in the years ahead of the crisis. And the predominant tendency of the International Monetary Fund in the years before the crisis was to stress the advantages of free capital flows, financial

⁶ M Schularick and A M Taylor “*Credit Booms Gone Bust: Monetary Policy, Leveraged Cycles and Financial Crises 1870 to 2008*”. NBER working paper number 15512, November 2009.

⁷ K Arrow and G Debreu. *Existence of an Equilibrium for a Competitive Economy*, *Econometrica* Volume 22, 1954.

deepening and financial innovation, making reference to theories of market completion and allocative efficiency.

- The third observation, however, is that at the most general level there is no clear and always present correlation between the financial intensity of an economy and, say, the overall rate of economic growth. Carmen Reinhart and Ken Rogoff in their recent survey of eight centuries of financial folly, crashes and debt defaults ('This Time it's Different') identify the period 1945 to the early 1970's as one of 'financial repression' in which the role of the financial system was subdued in many countries.⁸ And in some developing countries that 'financial repression' probably was one among a package of market restrictive policies which hampered economic growth. But equally there were countries which in that period achieved historically rapid growth with fairly depressed financial systems (for instance Korea) and in the more developed economies – the US, Europe, and Japan – this period of financial repression was one of significant and relatively stable growth, comparing well with the subsequent 30 years of increased financial activity and financial liberalisation.

To assess the question properly, however, we need to consider specific financial activities and the economic functions they perform. This section therefore sets out a detailed description of what has changed, under four headings.

- (i) The growth and changing mix of credit intermediation through UK bank balance sheets over the last 50 years.
- (ii) The growth of complex securitisation as a new form of credit intermediation over the last 10 to 20 years.
- (iii) The difficulty to quantify, but vitally important, change in aggregate maturity transformation, which the first two sets of changes have almost certainly produced.
- (iv) And finally the growth of financial trading activity over the last 30 years, linked in part to complex credit securitisation, but also visible in a far wider range of markets than credit securities alone.

(i) Growth and changing mix of bank intermediation

First then, trends in bank intermediation. What did UK banks do 50 years ago and what do they do today: what has changed? Well for data availability reasons my figures actually start 46 years ago in 1964. Chart 6 shows the balance sheet of the UK banking

⁸ C Reinhart and K Rogoff, *This Time it's Different: Eight Centuries of Financial Folly*, Princeton, 2009.

system in that year, with the quantities expressed as percents of GDP, the aggregate balance sheet of all UK banks then just 35% of GDP. And one of the things banks then did was to use deposits from the household sector to fund government debt, with banks holding large holdings of government debt as part of their liquidity policies, and with the UK's government debt level, at 93.2% of GDP, still reflecting the aftermath of high war indebtedness. But the other thing the banking and building society sections together did (Chart 7) was take net funds from the household sector – which deposited 40% of GDP but borrowed only 14% and lend it to the private, non-financial and corporate sector, which deposited 8% of GDP but borrowed 13%. In other words, it intermediated net household savings into business investment.

Over the subsequent 45 years, however, the pattern changed significantly (Chart 8). Household and unincorporated business borrowing from the banking and building society sectors grew from about 14% of GDP to 76% of GDP, while deposits grew also, but less dramatically from 39% to 72%. In addition, however, from the late 1990s, securitisation made possible loans to the household sector that were not, or not necessarily, held on bank balance sheets, these reaching 17% of GDP by 2007, the green shaded area on Chart 8.

Meanwhile (Chart 9) a somewhat similar, but more volatile pattern was observed for the corporate sector. With lending growing from 13% of GDP to 35%, but with sudden surges and set backs on the path. And with deposits growing from 8% to 17%.

So, putting the two sectors together (Chart 10) we get a growth of total lending far more dynamic than the growth of deposits, and the emergence on bank and building society balance sheets (Chart 11) of what is labelled 'a customer funding gap' a deficiency of customer deposits (household or corporate) versus loans to those sectors. This funding gap was bridged by increased wholesale funding, including wholesale funding from abroad, made easier by the fact that by 2007, unlike in 1964, the UK banking system's relationship with the UK real economy (captured on Chart 11) was within the context of London's role as a very large wholesale financial entrepot. Thus the total balance sheet of the UK banking system, defined to include all legal banking entities operating in London, had by 2007 reached around 500% of GDP, compared with 34% in 1964, and was dominated not by the banks' relationship with UK households and companies, but by a complex mesh of intra-financial system claims and obligations (Chart 12).

This funding gap and reliance on wholesale funding created significant vulnerabilities for the UK banking system which crystallised in 2007 and 2008: and new liquidity policies are being introduced to reduce such vulnerabilities in future. But it is not on the important risks and policies related to this funding gap that I wish to comment here, but on the increase in leverage in both the household and corporate sectors.

In both sectors, debt to GDP has increased significantly and in both the leverage has been focused on financing of real estate assets.

In the household and unincorporated business sector (Chart 13) the increase has been dominated by mortgage lending, up from 14% to 79% of GDP. Unsecured personal sector lending has increased from 3% at end 1975 to 9% but is still far less important than mortgage lending. Lending to unincorporated businesses meanwhile remains trivial in the big picture.

While in the corporate sector, the dramatic increase in debt to GDP in the last two decades has been dominated by the commercial real estate sector (Chart 14) with actually very little increase in the leverage of non commercial real estate related businesses. A dominance which looks even greater if we look at net lending. Thus if for the last 10 years, we look at gross lending to different corporate sectors (Chart 15) and gross deposits by different sectors into the banking system (Chart 16), then we can calculate each sector's **net** deposits to or net lending from the banking sector (Chart 17). What this illustrates is that the vast majority of net lending to the corporate sector is explained by lending to commercial real estate with, for instance, manufacturing only a marginal net borrower from the banking system, and indeed borrowing less in nominal terms than in 1998. While the service sector excluding wholesale and retail, hotels and restaurants is a net depositor, for understandable reasons given its inherent characteristics.

Summing up, therefore, the striking features of UK banking sector trends over the last 45 years are:

- First, a very significant financial deepening: i.e. an increase in both loans and deposits as a percent of GDP.
- Second, significant increases in the income leverage of both the household and corporate sectors, i.e. of indebtedness relative to GDP, and thus to income measures such as household income, corporate profit or property rentals.⁹
- And third, the fact that leverage growth has been dominated by increasing debt levels secured against assets, and predominantly against residential houses and commercial real estate.

⁹ Details of the several different ways of meaning leverage (relative to income or assets) are set out in the FSA Financial Risk Outlook 2010

(ii) The growth of complex securitisation

These changes in the scale and mix of banking intermediation have occurred gradually since the 1960s, with a strong acceleration after the financial liberalisation of the 1970s.¹⁰ The second overall trend I will highlight – the growth of the complex securitisation – accrued primarily over the last two decades, though with important initial developments in the 1970s and 80s.

I use the term ‘complex securitisation’ to stress the fact that marketable credit securities had been around for a long time before the securitisation wave of the last 20 to 30 years. These straight-forward credit securities, government bonds and corporate bonds were non-pooled and non-tranched: each security was the liability of a single government or corporate; and there was no process for creating multiple credit quality tiers out of the liabilities of one issuer. But they were credit securities which connected providers of funds to users of funds in a debt contract form, without the intermediation of a bank balance sheet. And the markets for these instruments were and are very big, illustrating the large potential investor base for medium and long term debt contracts (Chart 18). US debt to government debt to GDP reached 76% in 1945 and is 53% today with \$7.5 trillion dollars of T bonds outstanding. US single name corporate bonds (Chart 19) accounted for 50% of all corporate credit financing even back in the 1950s, and there are now \$4.1 trillion dollars of these straight forward single name corporate bonds outstanding.

So securitised credit – i.e. credit extension through purchase of marketable credit securities rather than through loans on bank balance sheet – is not new. But what ‘complex securitisation’ did was to extend the potential role of marketable credit securities to a wider range of final borrowers.

The initial and still most important application of this new technology was in residential mortgages, with two phases of development.

- First (Chart 20), the growth of US agency and Government-Sponsored Enterprise (GSE) mortgage backed securities from 1971 onwards, initially in a simple pass-through, non tranched form, but with tranching introduced with the creation of Collateralised Mortgage Obligations (CMOs) from 1983 on.
- Second, the growth of private label (i.e. non-GSE) mortgage backed securities from the mid 1980s onwards, with these usually using the new technique of tranching.

This growth of mortgage securitisation was then followed, from the late 1980s on, by the extension of securitisation to other asset categories (Chart 21), in particular consumer credit and commercial mortgages.

¹⁰ In the UK key policy measures were the liberalisation of the domestic banking system via “*Competition and Credit Control*” (1971) and the abolition of exchange controls in 1979

What in essence this complex securitisation did was to achieve outside a bank balance sheet two of the functions which, as we saw earlier, a bank balance sheet can deliver (Chart 22) – pooling of multiple small credit risks, and tranching so that different providers of funds can hold a variety of different combinations of risk and return. As a result complex securitisation made it possible to extend the role of credit securities beyond the sphere of governments and single named corporates. In addition, its advocates asserted that it delivered efficiency and welfare benefits arising from the fact that investors could select precisely that combination of risk and return which met their preferences. A combination which they could then continually and smoothly adjust through time, not only by buying or selling the underlying credit instruments, but also through use of the credit derivatives markets (Chart 23) which developed alongside complex securitisation.

(iii) Increasing aggregate maturity transformation

In addition to choosing their precise desired combination of risk and return, moreover, it appeared that securitisation enabled investors to enjoy precisely the liquidity that they desired, given the marketable nature of credit securities. The long-term buy and hold investor could hold a credit security for its long-term contractual maturity, but the short-term investor could sell at any time.

Securitisation therefore, by increasing the range of credits which could be securitised, played a role in what is almost certainly another key feature of the financial system of the last several decades – an increasing aggregate maturity transformation. Aggregate maturity transformation is the extent to which the financial sector in total (eliminating all **intra**-financial system claims) holds assets which are longer term than liabilities, and thus is the extent to which the non financial sector is enabled to hold assets which are shorter term than its liabilities. And it is frustratingly difficult to measure with any precision the level and trend of aggregate maturity transformation given the complexity introduced by the large scale of intra-financial system claims.

But the figures for household deposits and lending in the UK (Chart 24) clearly suggest that a significant increase in aggregate maturity transformation must have occurred. Loans to the UK household sector have increased dramatically as a percent of GDP, and these loans are primarily mortgages, with long-term contractual terms, 20 or 30 years or more. Deposits have increased also but these deposits are predominantly short term, many indeed are instant access. And buffers of highly liquid assets held by banks have significantly reduced. It therefore must be the case that the UK banking system, and banking systems in other countries, are performing more aggregate maturity transformation than in the past, and as a result running greater liquidity risks.

In addition, however, to increased maturity transformation on bank balance sheets, securitisation, combined with other financial innovations, resulted in an increasing level of maturity transformation **off** bank balance sheets. SIVs and conduits were major buyers of contractually long-term credit securities, but were funded by short-term commercial paper. Mutual funds with on-demand liabilities to investors who believed they enjoyed deposit like security of capital value, were investing in long-term credit securities, or in the commercial paper of SIVs and conduits, and thus involved in either one step or two step maturity transformation processes. And the trading books of commercial investment banks included large portfolios of contractually long credit securities, funded short term by repo financing arrangements.

All these new forms of maturity transformation relying crucially on the idea that ‘market liquidity’ would be available whenever needed. All helping to give investors more choice in respect to the liquidity of their investments. But all creating new financial stability risks.

(iv) Increasing trading activity across multiple markets

Fourth and finally in this review of key financial trends, the last 30 years have seen a quite remarkable explosion in the scale of financial trading activities relative to real economic variables.

- The value of foreign exchange trading has exploded relative to the value of global GDP or global trade (Chart 25). From 11 times global trade value in 1980 to 73 times today.
- The value of oil futures traded has increased from 20% of global physical production and consumption in 1980, to ten times today (Chart 26).
- And interest rate derivatives trading has grown from nil in 1980 to \$390 trillion in mid-2009 (Chart 27).

Summing up, therefore, increasing financial intensity in the UK, US and other advanced economies over the last 40-50 years, and in particular the last 30, has been driven by the following factors.

- Increased leverage of non financial sectors, in particular driven by increased lending against real estate assets, both residential and commercial.
- The growth of complex securitisation, which has in particular supported more residential mortgage lending.
- An increased level of aggregate maturity transformation.
- Increased trading activity and market liquidity.

- And, as a result of these other trends, an increase in the scale and complexity of **intra**-financial system claims, claims between financial institutions rather than between them and the real economy.

The crucial question is whether this increase in financial activity has delivered human welfare benefits and if so how:

- Via the direct welfare benefits of more effective consumption smoothing?
- Or via improved allocation of capital?
- Or via increased savings rates and growth rates?
- Or via optimal savings rates and growth rates, even if not necessarily increased rates?

3. Bank credit extension: optimal role and mix

The development of the modern market economy over the last 200 years has been accompanied by a pervasive development of banking systems, performing the first three functions outlined in Section 1 – pooling of risks, maturity transformation, and risk return transformation via the introduction of an intermediating equity slice. As a result depositors enjoy high certainty of capital value combined with short contractual maturity: equity fund providers take much greater risk, but with that risk still bounded by limited liability.

So fundamental and pervasive are these features of banking systems within market economies, that there is a tendency to think that they are inherent and inevitable. In fact, however, there have always been economists concerned that these features create market instability: Irving Fisher and Milton Friedman warned against the dangers of a classic fractional reserve banking model: and in the last year Professor John Kay in Britain and Professor Laurence Kotlikoff in the US have produced ‘narrow bank’ or ‘limited purpose bank’ proposals which would completely reject the model in which short-term deposits of certain value can, via transformation, fund risky household and commercial loans.¹¹

I am not going to argue in this chapter for either of those radical change models. Indeed I believe that Professor Kay’s and Professor Kotlikoff’s proposals would not effectively address the fundamental problem we face – which is volatility in the supply of

¹¹ L Kotlikoff, *Jimmy Stewart is Dead: Ending the World’s Ongoing Financial Plague with Limited Purpose Banking*, Wiley 2010. J Kay, *Narrow Banking, The Reform of Banking Regulation*, CFSI, 2009

credit to the real economy, and biases in the sectoral mix of that credit. A volatility and bias which, as I shall describe in Section 4, can occur as much in a non-bank securitised form of credit extension as when credit is extended on balance sheet. But the fact that there are respected economists arguing that the entire structure of banking is inappropriate does mean that we need to go back to the basics of whether and why and under what circumstances banks as we currently know them add value to the real economy.

A classic statement of how fractional reserve banking adds value was set out in Walter Bagehot's *Lombard Street*. He argued that banking enabled the mobilisation of savings, that, for instance, Britain enjoyed an economic advantage over France because the UK's more advanced banking system fostered the productive investment of savings rather than leaving them 'dormant': '*Much more cash*' – he wrote – '*exists out of banks in France and Germany and in the non-banking countries than can be found in England or Scotland, where banking is developed. But this money is not... attainable... the English money is "borrowable money"*'. Our people are bolder in dealing with their money than any continental nation... and the mere fact that their money is deposited in a bank makes it attainable. A place like Lombard Street where in all but the rarest times money can be obtained on good security or upon decent proposals of probable gain is a luxury which no other country has ever enjoyed before'.

Bagehot's argument rests essentially on the positive benefits of the transformation functions considered in Section 1, with the pooling, maturity and risk/return transformation functions of Britain's banking system enabling individuals with secure liquid deposits to finance trade and investment through loans to borrowers with whom they had no direct contact, and whose liabilities were of longer term; while in France, with a less developed banking system, the capital formation process depended to a greater extent on the creation of precise matches – people with money who happened also to have entrepreneurial and management capability, or who could make direct contracts with specific businesses.

Bagehot's initial insight is reflected in the predominant belief that 'financial deepening' is good for an economy: that more financial intermediation, measured by credit as a % GDP, will mean higher investment and thus higher GDP. And a number of studies have indeed illustrated either cross-sectoral or time series correlations between the development of basic banking and financial systems and economic growth.¹² And from the current position of a developing nation like, say India, the positive benefits of some financial deepening do seem clear. But the paper by Moritz Schularick and Alan Taylor which I quoted earlier, questions whether this positive relationship pertains as economies move beyond the level of financial maturity reached in the advanced countries

¹² See, e.g. I.R.G.King and R.Levine *Finance and growth: Schumpeter might be right*, Quarterly Journal of Economics" 1993, or Rouseeou and Sylla, *Emerging Financial Markets and Early US Growth*, NBER WP 7448

30 to 40 years ago. It documents the growth of leverage and credit extension which liberalisation and innovation have facilitated, but finds little support for the proposition that this liberalisation and innovation has led to a corresponding increase in real growth rates for the countries in their sample.

It is on this question of financial deepening beyond the level reached in the advanced countries 30 to 40 years ago that I will focus here. And in doing so I will focus solely on what one might label the long term comparative statics issue, not the issue of transitional dynamics.

- By long-term comparative statics I mean the question, would the UK, for instance, be better or worse off if in, say 2025, we had a debt to GDP of 120%, or 100% or 80%. Or indeed would we be better or worse off if today we had 80% debt, with debt never having grown to today's level of 125%? To answer that question we need to consider the impact of credit on the long-term savings rate and the efficiency of capital allocation and thus on the long-term productive potential of the economy: and we also need to consider the direct welfare benefits which credit can deliver through life cycle consumption smoothing.
- The transitional dynamics question, by contrast, is quite different. It accepts as a necessary given that we start with private debt to GDP of 125% and asks what is the optimal evolution of this level over the medium term, say the next five years. To answer that question we need to consider the implications of changes in credit supply for aggregate nominal demand, and thus for the path of actual GDP (and employment) relative to productive potential.

We need to know the answers to both questions, and the answers might well pose a policy timing dilemma, with de-leveraging beneficial over the long term, but harmful over the short. And both questions are highly relevant to the design of the new capital and liquidity regulatory regime on which the global institutions – the Financial Stability Board and the Basel Committee – are engaged this year. Higher capital and liquidity requirements together will probably mean less plentiful credit supply. The newly established Macroeconomic Assessment Group jointly established by the Bank of International Settlements (BIS) and the Financial Stability Board (FSB), will therefore need to consider both the long term and the transitional implementations of such restriction. For now, however, I will focus solely on the long-term question.

And I will begin by assuming that higher capital and liquidity requirements will increase the cost of credit intermediation and thus increase the price and/or decrease the quantitative supply of credit. I say 'assume' because at least in respect to higher capital requirements there is a theoretical debate. If, for instance, the propositions of Modigliani and Miller hold, higher equity capital requirements ought to produce a lower cost of bank

equity and a lower cost of bank debt (since the riskiness of both would reduce), and in a taxless world those effects would fully offset the higher proportionate role for relatively more expensive equity.¹³ In the real world of tax biases in favour of debt, however, there clearly is a private cost penalty to higher equity requirements, and the case that tighter liquidity requirements increase the cost of long-term credit provision appears fairly clear.

So assuming that higher capital and liquidity requirements do mean more expensive and less plentiful credit supply, what economic consequences follow?

A common and apparently obvious answer assumes that a higher cost of credit and more restricted supply of credit will mean that capital investment will be reduced as productive investments go unfinanced. The assumed model here is that of a marginal efficiency of capital schedule (Chart 28) with possible investment projects ranked by order of return, and with the level of investment in the economy, the number of projects which get financed, determined by how many deliver a return higher than the cost of capital. Increase the cost of credit intermediation and fewer projects will be financed.

Under this model it can still be socially optimal to raise capital requirements since the impact of increased credit intermediation costs in good years can be offset by a decreased risk of financial crises. Models which assume that this is the balance to be struck, such as the NIESR model which the FSA has been using to consider the tradeoffs involved in the setting of new capital liquidity requirements, can still suggest that significant increases in capital and liquidity requirements are socially optimal.¹⁴ But such models still assume that increased bank capital means decreased investment and thus reduced growth in good times. And this is the quite explicit assumption behind much private sector input to the regulatory debate.

What I would like to question, however, is whether this model of the impact of credit supply constraint is actually relevant to all, or indeed more than a small proportion, of the total credit supply described in my earlier charts. Consider for instance, the growth of UK mortgage credit, which has gone over the last 45 years from 14% to 79% of GDP. Obviously to some extent, mortgage credit indirectly helps finance new investment in housing. But over the last 50 years capital investment in UK housing as a percentage of GDP (Chart 29) has oscillated but with no particular trend. And the net capital stock of investment in residential housing measured as accumulated past investment minus depreciation has as a result not risen as a percentage of GDP (Chart 30). Instead what we

¹³ Miller M and Modigliani F: “*The Cost of Capital, Corporation, Finance and the Theory of Investment*”, American Finances Review 1958, 48.3, pp 261-297 – “*Corporate Income Taxes and the Cost of Capital: A Correction*”, American Economics Review, 53.3, 1963, pp 443-453

¹⁴ See FSA Turner Review Conference Discussion Paper, October 2009, for a description of the modelling approach using the NIESR model. Note that the NIESR model does distinguish the impact of credit restrictions on the corporate versus household sector, but does not distinguish within the corporate sector between different categories of credit (eg, commercial real estate versus all others) in the way considered later in this section.

have is phenomenon in which mortgage debt as a percent of GDP and the market value of housing, have risen in a fashion largely detached from the processes of capital investment.¹⁵

Which does not, I must immediately stress, mean that mortgage finance has no economic or social value but rather that in countries with relatively stable populations and with large housing stocks inherited from the past, the economic function of mortgage finance is only to a very limited extent related to the financing of new investment, and to a very large extent supporting the ability of individuals to smooth consumption over the life cycle, with younger generations buying houses off the older generation who already own them.¹⁶ The extent to which this is the case varies with national characteristics such as the density of population and the growth rate of the population (or of household numbers) but it is as least possible to imagine an economy which was making no new net investment in housing but which had a high and rising level of mortgage debt to GDP.

An assumed model in which an increased cost of credit intermediation would curtail investment and thus growth, is therefore largely irrelevant to residential mortgage debt in the UK, and thus for 63% of all bank lending. Instead, when we think about the value added of different levels of mortgage debt, the trade-off is follows.

- A plentiful supply of residential mortgage debt will increase human welfare by enabling individuals to smooth the consumption of housing services through their life cycle. It enables the individual without inherited resources to use future income prospects to purchase houses today. And it lubricates a process by which one generation first accumulates housing assets and then sells them to the next generation, achieving an inter-generational resource transfer equivalent to a pension system. A more restricted supply of mortgage finance makes access to home ownership more dependent on the vagaries of inheritance, and tends to produce an inefficient use of housing resources, with older people facing few incentives to trade down from large houses and to release housing resources for use by the younger generation.
- Conversely, however, the easy availability of mortgage credit can generate a credit/asset price cycle, and can encourage households on average to select levels of income leverage which, while sustainable in good and steady economic times, increase vulnerability to employment or income shocks. It can therefore create

¹⁵ The difference between the market value of housing and the net capital stock illustrated on is to a significant extent explained by land values. Mortgage credit in a rich densely populated but stable population country is therefore to a very significant extent financing the purchase of a fixed supply of land by one generation from another.

¹⁶ The key element of consumption which is smoothed is the flow of housing services which ownership of a house delivers.

macroeconomic volatility. And it can tempt some individuals, in pursuit of prospective capital gain, into debt contracts which harm their individual welfare rather than maximise it.

There are therefore very important advantages and risks created by extensive mortgage credit supply, which need to be taken into account in decisions about bank capital and liquidity (or any other policy levers which might impact on credit supply). But the optimal resolution of this balance has no necessary implications either way for the overall level of investment and growth in the economy, on which discussions of the impact of capital adequacy regimes frequently focus.

Similar considerations may apply when thinking about some sub-sets of corporate lending, and in particular lending to the corporate real estate sector, which has grown so dramatically in the last 20 years as a percentage of GDP and as a share of total corporate lending.

And here again I definitely do not suggest that all lending to commercial real estate is somehow socially useless, and that, as it were ‘real bankers only lend money to manufacturing companies’. In a mature economy indeed, high quality investment in commercial real estate – high quality hotels, office space and retail parks – and the related investment in the public urban environment, is definitely part of the wealth creation process. Fixed capital formation in buildings and structures at around 6% of GDP is now slightly higher than total investment in all plant, machinery, vehicles, ships and aircraft, and that may well be what we should expect in a mature rich economy (Chart 31).

But note that it was just as high as a percentage of GDP in 1964, when total lending to real estate developers was much lower.

Which suggests that alongside the role which lending to commercial real estate plays in financing new productive real estate investment, what much CRE lending does is to enable investors to leverage their purchase of already existing assets, enjoying as a result the tax benefit of interest deductibility, often in the expectation of medium-term capital gain, and in some cases exploiting the put option of limited liability.

Thus in both residential and commercial real estate lending, the model in which we assume that more expensive credit would restrict productive investment is only partially applicable. In both, moreover, we need also to recognise the role that credit can play in driving asset price cycles which in turn drive credit supply in a self-reinforcing and potentially destabilising process. Thus, (Chart 32) increased credit extended to commercial real estate developers can drive up the price of buildings whose supply is inelastic, or of land whose supply is wholly fixed. Increased asset prices in turn drive expectations of further price increases which drive demand for credit: but they also improve bank profits, bank capital bases, and lending officer confidence, generating

favourable assessments of credit risk and an increased supply of credit to meet the extra demand.

So that overall as we look at the drivers and economic functions of credit, we must I believe distinguish between different categories (Chart 33), which have different economic functions and whose dynamics are driven by different factors. Household credit, 74% of the total, is essentially about life cycle consumption smoothing and inter-generational resource transfer not productive investment. Real estate lending, which combining household and commercial real estate, amounts to over 75% of all lending in the UK, is at times strongly driven by expectations of asset appreciation. Commercial real estate and indeed leveraged buy out borrowing has quite a lot to do with exploiting the tax shield of debt and the put option of limited liability. Only lending to non-real estate companies therefore appears to accord fully with the commonly assumed model in which credit finances investment and trade and is serviced out of capital flows, and in which a higher cost of credit will curtail productive investment. But in the UK at least such lending accounts for a relatively small proportion of the total (Chart 34).

In deciding optimal levels of capital and liquidity for the banking system we therefore need to consider the possible impact on different categories of lending whose economic value or direct welfare benefit is quite different. We also need to recognise, however, that the elasticity of response of different categories of credit to interest rate changes is likely to be hugely varied and to vary over time in the light of changing expectations of future asset prices.

- The company which is thinking of investing in a new project – be it a new manufacturing product development, a new energy investment, or a new retailing concept – and intending to repay the loan out of project cash flows, may be very sensitive to minor variations in expected interest rates. So also to a less but still significant extent might be the individual using unsecured credit to smooth short-term cash flows.
- But when expectations of property (or other asset) price inflation have become strongly embedded, even quite large increases in interest rate may have little short-term impact – to the homeowner or commercial real estate investor who expects medium-term capital appreciation of say 15% per annum, small increases in lending rates may make little difference to their propensity to borrow.

There is therefore a danger that at some points in the credit/asset cycle appropriate actions to offset the economic and financial stability dangers of exuberant lending will tend to crowd out that element of lending which is indeed related to the funding of marginal productive investments.

This in turn carries implications for optimal policy. The analysis presented in this section suggests three conclusions.

- First, that we cannot base our assessment of optimal capital and liquidity levels solely on the ‘marginal productive investment’ model, but that we do need to understand what impact higher capital requirements would have on fixed capital investment.
- Second, that optimal policy almost certainly needs to distinguish between different categories of credit, which perform different economic functions and whose interest rate elasticity of demand is likely, at least at some points in the cycle, to vary hugely.
- And third that optimal policy needs to be able to lean against credit and asset price cycles.

These conclusions together suggest the need for macro-prudential through-the-cycle tools, and perhaps for those tools to be differentiated in their sectoral application.¹⁷ We need new tools to take away the punch bowl before the party gets out of hand. Four approaches could be considered:

- The first is for interest rate policy to take account of credit/asset price cycles as well as consumer price inflation. But that option has three disadvantages: that the interest elasticity of response is likely to be widely different by sector – non-commercial real estate SMEs hurting long before a real estate boom is slowed down: that higher interest rates can drive exchange rate appreciation: and that any divergence from current monetary policy objectives would dilute the clarity of the commitment to price stability.
- The second would be across the board countercyclical capital adequacy requirements, increasing capital requirements in the boom years, on either a hired-wired or discretionary basis. But that too suffers from the challenge of variable elasticity effects, given that capital levers also work via their impact on the price of credit.
- The third would be countercyclical capital requirements varied by sector, increased say against commercial real estate lending but not against other categories. That certainly has attractions, but might be somewhat undermined by international competition, particular within a European single market. If, for instance, Ireland had increased capital requirements for commercial real estate lending counter-cyclically in the years before 2008, the constraint on its own banks would have been partially offset by increased lending from British or other foreign competitors.

¹⁷ The case for such tools and the complexities involved in their application are discussed in the Bank of England discussion paper “*The Role of Macro Prudential Policy*”, November 2009.

- The fourth would entail direct borrower focussed policies, such as maximum limits on loan-to-value ratios, for instance, either applied continuously or varied through the cycle.¹⁸

There are no easy answers here, but some combination of new macro-prudential tools is likely to be required. And a crucial starting point in designing them is to recognise that different categories of credit perform different economic functions and that the impact of credit restrictions on economic value added and social welfare will vary according to which category of credit is restricted.

4. Complex securitised credit: reducing or increasing risk?

The growth of complex securitised credit was discussed in Section 3 (ii) and its role in driving increased maturity transformation was discussed in Section 3 (iii). It played a major role in the 2008 crisis. It was not the sole driver of that crisis: the rapid expansion of poor quality on-balance sheet lending, financed by wholesale funding, was also important. And securitisation and related trading played no significant role in some of the biggest individual bank failures; it was, for instance, irrelevant to HBOS's over expansion into commercial real estate. But clearly securitisation was an important part of the story, complex securitisation supported an explosion of low quality mortgage credit origination in the US and new forms of off-bank balance sheet maturity transformation created major new risks. And excessive complexity created problems of intransparency, imperfectly understood risks, and confidence and contagion effects driven by uncertainties over the value of 'toxic assets'.

Before the crisis, however, securitisation and the associated growth of credit and other derivatives were widely lauded as favourable developments, improving investor and borrower choice, economic efficiency and risk management. In the wake of the crisis we should therefore ask:

- Whether the positive benefits attributed to securitisation and credit derivatives were or could be significant.
- And whether the risks which complex securitisation helped generate are inherent to the provision of credit in a securitised form, or arose simply because of bad features

¹⁸ Note that while national borrower focussed limits are also susceptible to cross-border leakage problems (eg, through the use of legal entities in other countries) these problems are least in respect to lending secured against real estate, given the immovable nature of property, and the potential to design restrictions on the level of debt which can be secured against specific properties.

of the pre-crisis securitisation, features we can fix via better regulation or market practice.

Four related arguments were advanced in favour of credit securitisation.

- First that it enabled banks better to manage their balance sheet risks.¹⁹ Rather than say, a regional bank in the US holding an undiversified portfolio of credit exposures in its region, it could instead originate loans and distribute them, it could hedge credit exposure via credit derivatives and interest rate exposure via interest rate derivatives. In some past banking crisis – such as the US banking system collapse of the early 1930s, or the savings and loans crisis of the 1980s – the problems were in part the undiversified nature of specific bank exposures, or the lack of instruments to separate credit risk exposure from interest rate mis-match. Securitisation appeared to fix these problems.
- Second, it was argued that complex securitisation achieved market completion, with pooling, tranching and marketability enabling each investor to hold precisely that combination of risk/return/liquidity which best met their preferences. It was assumed by axiom that this must in some way be good – either, presumably, in a direct welfare sense, or because it enabled the attainment of a higher, or at least an optimal savings rate.
- Third, and as a result, it was asserted that securitisation not only made individual banks less risky, but the whole system more stable, because risk was dispersed into the hands of precisely those investors best suited to manage different combinations of risk.
- Fourth, it was argued that securitisation supported increased credit supply. Complex securitisation of sub-prime mortgage credit in the US was valuable because it enabled new classes of borrower to enjoy the benefits of life-cycle consumption smoothing, and the use of Credit Default Swaps (CDS) was beneficial because it enabled banks to better manage credit risk, economising on the use of bank capital and enabling them to extend more credit off any given capital base.²⁰

Obviously something went badly wrong with this rosy vision, and in particular with the proposition that complex securitisation would reduce individual bank and system wide risks. And the easy thing, with the benefit of hindsight, is to list the specific features of pre-crisis securitisation which created major risk.

¹⁹ See eg, Lowell Bryan, *“Breaking up the Bank”*, 1988

²⁰ In the pre-crisis years, “using bank capital more efficiently” (i.e. being able to support more lending on any given level of bank capital) was perceived as not only a rational private objective for individual banks, but as a valuable social objective. Thus the Basel II capital adequacy regime was designed around the overt principle that if banks could develop more sophisticated risk management systems, they should be allowed to operate with higher leverage.

- Inadequacies in credit ratings, as rating agencies with conflicts of interest were tempted into putting ratings on securities for which no sound rating methodology existed.
- Poor incentives for good underwriting: originators and traders who cared little whether the credit was good as long as they could sell it before any problems arose.
- Over complexity – particularly in the final decade before the crisis, with a proliferation of the alphabet soup of ever more exotic re-securitisations, such as CPDO's and CDO squareds, combined with a general lack of transparency about underlying credit quality.
- Poorly understood embedded options – again particularly a problem in the most complex products which emerged in the final decade.
- And far too low capital requirements against the holding of credit securities in trading books, creating massive capital arbitrage opportunities, and resulting in a model of securitised credit which was called 'originate and distribute', but which was actually 'originate, distribute, and then acquire somebody else's credit securities', so that when the music stopped the biggest losses actually arose on the balance sheets of banks and investment banks.²¹

In response to this list of now obvious problems, an extensive regulatory reform programme is in hand, involving:

- Regulation of credit rating agencies to guard against conflicts of interest.
- Various forms of risk retention requirements to ensure that credit originators have 'skin-in-the-game'.
- Requirements for better disclosure of underlying risk.
- And a radical reform of trading book capital. The Basel Committee has already announced specific changes, for implementation by 2011, which will increase capital requirements against specific trading activities several times, and a fundamental review of all trading book capital requirements will be completed over the next 12 months.

Alongside these regulatory responses meanwhile, a market reaction ('once bitten twice shy' as it were) is likely in itself to mean that when securitised credit returns it does so without some of the past excesses. The market place is likely to demand simple and

²¹ See eg, the estimates of the incidence of losses set out in the IMF's Global Financial Stability Report of October 2008.

transparent structures: and, even if regulators allowed it, to have no appetite for the hyper complex instruments of the final stage of pre-crisis exuberance.

So the regulators and the market together have a clear view of past problems: and I think we will fix them. But what we do not know is whether fixing these problems means that complex securitisation bounces back in a new less risky form, or whether it never returns, or at least not on anything like the same scale. Because what is not clear is how far previous market volumes were only possible because of intrinsically risky practices.

So beyond the immediate agenda of obvious things we should do and are doing, two questions remain:

- Did complex securitisation deliver economic value?
- And were the risks it generated fixable or inherent?

(i) Securitisation and related derivatives: What economic value added?

Let's consider the 'economic value added' case for securitisation under three headings.

- The first is market completion, the idea that complex securitisation and derivatives must have delivered value added because they completed markets, making possible particular contracts not previously available, and thus allowing investors to pick precisely that combination of risk, return and liquidity which best met their preferences. In theory these benefits of 'market completion' follow axiomatically from the Arrow Debreu theorem, and in the pre-crisis years many regulators, and certainly the FSA, were highly susceptible to this argument by axiom. We were philosophically inclined to accept that if innovation created new markets and products that must be beneficial and that if regulation stymied innovation that must be bad. We are now more aware of the instability risks which might offset the benefits of such innovation. But we also need to question how big the benefits could possibly have been, even if securitisation had not brought with it risks of instability. And here two perspectives are important.
 - The first is that to the extent that complex structuring was driven by either tax or capital arbitrage, reducing tax payments or reducing capital requirements without reducing inherent risk, then it clearly falls in the category of the 'socially useless' (i.e. delivering no economic value at the collective social level) even if it generated private return. And a non-trivial proportion of complex securitisation was indeed driven by tax and capital arbitrage.

- Second, that while there clearly is an economic value in market completion, it must be subject to diminishing marginal return. That beyond some point, the additional welfare benefit of providing ever more tailored combinations of risk, return and liquidity must become minimal.

Together these two perspectives argue for a far greater scepticism about market completion arguments in future than was common pre-crisis.

- As for the second argument, that complex securitisation made possible increased credit extension, that is undoubtedly true. In the US, the UK and several other markets, securitisation of residential mortgages made possible the extension of mortgage credit to segments of the population previously excluded from credit access. But whether or not that was truly beneficial, takes us back to precisely the considerations about the economic function and value of credit which I discussed in Section 3, and to the different functions that different categories of credit perform. And just as with on balance sheet mortgage credit extension, so with securitised mortgage credit, the key issues are the extent to which the increased life cycle consumption smoothing made possible was socially beneficial, and the extent to which increased supply of credit drove asset prices in a volatile cycle, rather than the extent to which more credit enabled marginal productive investment. Even from a direct consumer welfare point of view, let alone from a macro volatility point of view, it is clear that much of the extension of credit to new categories of borrowers which was made possible by mortgage securitisation in the US, and to a degree in the UK, was harmful rather than beneficial to the individuals concerned.^{22 23}
- Third and finally, the arguments relating to better risk management, both at the individual firm level and at the system level. Given how spectacularly the system blew up, it might seem obvious that this is the least convincing of the arguments for complex securitisation. But in principle, and providing securitisation was done well and distribution truly achieved, this might be the most convincing of the three arguments put forward. In principle it would be better if small and mid-size banks did not hold undiversified credit exposure to particular sectors or regions and the use of credit default swaps to enable banks to adjust and diversify their credit risks

²² The FSA's Mortgage Market Review, October 2009, describes for instance how securitised lending in the UK, extended credit to new categories of previously excluded borrower, but also the extent to which arrears and repossessions are concentrated in these sectors.

²³ The high credit losses incurred on US sub-prime and Alt-A lending ultimately derive from the fact that the individuals concerned did not have the income levels to sustain the debt they took on, which could only have been made affordable via further house price appreciation. This illustrates that while the extension of credit to previously excluded sectors can enhance welfare by making possible consumption smoothing, it cannot in a sustainable and non-risky way increase the lifetime earnings/consumption which are being smoothed. If customers are excluded from credit access because their lifetimes earnings prospects are low, the extension of credit cannot overcome and could make worse problems which can only be addressed through income enhancement or redistribution.

can have an economic value. As a result, securitised credit and credit derivatives probably will and should play a significant role in the financial system of the future. But recognising that fact should not lead us to fall into the trap of believing that ever more complex innovation is beneficial because it completes more markets, or that an increased aggregate supply of credit is a valid argument in favour of innovation and light regulation.

(ii) Risks in the securitised credit model: fixable or inherent?

As discussed above, pre-crisis complex securitisation was made risky by a number of apparently fixable problems. But risks were also created by two more fundamental factors, which together imply that securitisation is unlikely to return on the scale which existed pre-crisis, and that new tools for macro prudential management of the credit cycle – discussed in Section 3 – are as relevant to securitised credit as to on balance sheet credit.

Maturity transformation – The first of these fundamental factors is maturity transformation. As discussed in Section 2 (iii) investor demand for securitised credit was supported before the crisis by new forms of maturity transformation, contributing to the increase in aggregate maturity transformation which made the financial system more vulnerable to shocks. SIVs and conduits bought contractually long securities funded with short-term commercial paper; mutual funds with very short-term liabilities bought either long-term securities or the commercial paper of SIVs and conduits; and banks and investment banks financed large trading book securities portfolios with repo finance. The proportion of the securitised credit investor base which was only present because of these unsafe forms of maturity transformation is difficult to quantify, but it may have constituted more than half of the total, and it is these sources of demand which collapsed most precipitously during the crisis (Chart 35). While the origination and distribution of pooled and tranching securities are likely to play a significant role in the future system, it will likely be a much smaller role than existed pre-crisis.²⁴

Securitised credit, self-referential pricing and instability – The second fundamental issue is whether a financial system in which securitised credit plays a greater proportionate role is likely to be one in which the volatility of the credit and asset price cycle described in Section 3 is still more severe. Securitisation is certainly not the only cause of credit cycles: purely bank-based credit systems can and have generated self-reinforcing credit and asset price upswings of the sort described on Chart 32, followed by

²⁴ Note that this fact is highly pertinent to the “transitional dynamics” issue which this chapter does not consider but which is extremely important. In a long term comparative static sense, the disappearance of securitised credit extension based on unsafe maturity transformation may be strongly positive: but over the medium term, the likelihood that securitised credit markets will not return to their pre-crisis scale, makes still more acute the issues of transition management in implementing new capital and liquidity requirements which will restrict on-balance credit extension.

credit crunches when the cycles swing into reverse. There have been many past banking crises in systems where securitised credit played an insignificant role.²⁵

But a pervasive role for securitised credit can further increase the potential for volatility by increasing the extent to which credit-risk assessment and credit pricing becomes self-referential, with credit security investors and bank loan officers deriving their assessment of an appropriate price for credit not from independent analysis of credit risks but from the observable market price. Thus for instance the International Monetary Fund (IMF) Global Financial Stability Review of April 2006 noted that credit derivatives ‘enhance the transparency of the market’s collective view of credit risks... (and thus)... provide valuable information about broad credit conditions and increasingly set the marginal price of credit’. But a marginal price of credit set by a liquid market in credit derivatives is only economically valuable if we believe, as per the efficient market hypotheses, that ‘the market’s collective view of credit risks’ is by definition a correct one. If instead we note the movement in the CDS spreads for major banks shown on Chart 36, with spreads falling relentlessly to reach a historic low in early summer 2007, and providing no forewarning at all of impending financial disaster, we should be worried that an increased reliance on market price information to set the marginal price of credit, could itself be a source of credit and asset price volatility, particularly when combined with mark-to-market accounting.

A credit system which combines both maturity transforming banks and a significant role for traded credit securities could therefore be even more susceptible to self-reinforcing exuberant upswings and subsequent downswings than a pure bank system (Chart 37).

- With mark-to-market profits reinforcing management’s, investors’ and traders’ confidence and animal spirits, and swelling bank capital bases and thus supporting more trading or more lending.
- And with the link from high asset prices to favourable credit assessments now hard wired into the system, as high asset prices drive higher credit securities prices and lower spreads, which are then used to set the marginal price of credit.
- A set of self reinforcing cycles clearly evident in the years running up to the crisis: reversing into the self-reinforcing downward spiral of confidence and credit extension which has caused such economic harm.

²⁵ For instance the US savings and loans crisis of the 1980’s, and the Japanese and Swedish banking crises of the 1990s.

The reasons why the latest financial crisis was so severe may therefore have been rooted in the interaction between the specific characteristics of maturity transforming banks and those of a securitised credit system.

Two implications follow. First, that the emergence of a global credit supply system which combines bank balance sheet and securitised elements has increased the importance of macro-prudential tools. Second, that in considering the design of new macro-prudential tools to address the volatility of the credit cycle, we need to consider the potential volatility of securitised credit extension as well as on balance sheet credit. Tools which solely address on-balance sheet credit, such as variations in capital requirements against particular categories of credit, might be undermined if over exuberant credit supply simply migrates to an off-balance sheet form. This might, along with the cross border competition factors already noted, imply the need to consider borrower focused restraints (e.g., maximum Loan-to-Values (LTVs)) rather than concentrating solely on lender focus credit supply.

Summing up therefore on complex securitisation and related credit derivatives markets:

- It seems highly likely that securitisation will continue to play a significant role in the credit intermediation process, and with appropriate regulation and market discipline, could perform a socially useful function of enabling improved risk management.
- But the pre-crisis ideology that ‘market completion’ arguments justified ever more complex innovation, which regulators should never impede, ignored the fact that returns from market completion must be subject to diminishing marginal returns, ignored the extent to which much innovation was based on tax and capital arbitrage, and ignored the risks which complexity created.
- And the fact that a considerable proportion of investor demand relied crucially on risky maturity transformation, means that securitisation’s role in future is likely to be more limited than in the past.
- Finally and crucially, a system of securitised credit interacting with a system of maturity transforming banks can further increase the risks of self-reinforcing credit and asset priced cycles and therefore further increase the case for new macro prudential tools.

5. Market making and position taking: valuable up to a point?

One of the functions which banks and investment banks perform in the market for credit securities and credit derivatives is to trade and thus provide liquidity, enabling end investors and other market users to buy and sell at reasonably low bid-offer spreads. That activity is one among many trading activities in which banks have been increasingly involved, with, as shown in Section 3(iv), an explosion over the last 30 years in the volume of trading activity relative to real economic variables.

What value did this explosion of trading actually deliver: how valuable is the liquidity which position-taking, or as some would label it, speculation, makes possible?

The question is a politically sensitive one, because market making and proprietary trading to support it are at times highly profitable for firms and for individuals. Lending officers guilty of lending badly to commercial real estate firms in an irrationally exuberant upswing may have been overpaid relative to the economic value added of their activity for society, but it is not in that area of financial services but within the trading rooms of banks, investment banks and hedge funds that remuneration sometimes reaches levels which to the ordinary citizen are simply bewildering. There is therefore strong popular support for measures to curtail either trading volume or the profits derived from it, whether by direct regulation of trading room bonuses, ‘Volcker rule limits on commercial banks’ involvement in proprietary trading, or financial transaction taxes such as that proposed by James Tobin.

The high profitability of market making and proprietary trading – to the firms and to individuals – reflects two facts: first that end customers appear to place great value on market liquidity; second that market makers with large market share and high skills are able to use their knowledge of underlying order flow and of interconnections between different traded markets to make position taking and complex arbitrage profits.²⁶

And the fact that end customers greatly value liquidity is in turn taken by the proponents of ever more active trading as proof that more trading and more liquidity must be socially valuable as well as privately profitable. The dominant ideology of financial

²⁶ The proponents of separating ‘casino’ banking from commercial banking often argue in support that proprietary trading activity and market making is only profitable because risk taking is cross-subsidised by “Too Big To Fail” status and a significant tax payer guarantee. It is notable however that some of the most profitable market making activities, either at all times (eg, spot and FX) or at particular times (government bonds during 2009) are actually relatively low risk, and have very rarely resulted in losses which have harmed individual bank solvency or total system stability. Several market making functions appear to deliver super normal returns even when fully risk adjusted.

liberalisation and innovation, has therefore argued that increased liquidity is wholly beneficial in all markets for five reasons.

- Increased liquidity enables end customers to trade at low bid offer spreads and in large amounts: for any given scale of activity this decreases their costs.
- If faced with this lower cost per transaction, customers transact more and therefore provide more net revenues to the market makers and professional position takers, that must be because they derive value from it.
- Liquidity indeed is directly valuable because – in the classic argument of market completion – it provides investors with a wider set of options, in this case the option to sell whenever they want.
- And liquidity creates value by ensuring efficient ‘price discovery’, with a wider set of market participants able to contribute to the collective judgement of the rational market and with correct prices driving allocative efficiency.
- Finally, these benefits of liquidity are likely to be accompanied by reduced volatility, since liquidity is in part created by professional position takers who spot divergences of prices from rational levels and by their speculation correct these divergences.

These arguments reflect the dominant conventional wisdom of the last several decades based on the assumptions of rational expectations and of efficient and self-equilibrating markets. And they have been frequently and effectively deployed to argue against regulations which might limit trading activity. And some of these arguments are compelling, up to a point – reduced bid offer spreads on forward Foreign Exchange (FX), must for instance have delivered value to exporters and importers.

But Keynes believed that ‘of the maxims of orthodox finance, none surely, is more anti-social than the fetish of liquidity and the doctrine that it is a positive value on the part of institutional investors to concentrate their resources on the holding of “liquid” securities’. And scepticism about the limitless benefits of market liquidity supported by speculative trading is justified on at least three grounds.

- First, the fact that the benefits of market liquidity must be, like the benefits of any market completion, of declining marginal utility as more market liquidity is attained. The additional benefits deliverable, for instance, by the extra liquidity which derives from flash or algorithmic trading, exploiting price divergences present for a fraction of a second, must be of minimal value compared to the benefits from having an equity market which is reasonably liquid on a day-by-day basis.

- Second, the fact that greater market liquidity and the position taking and speculation required to deliver it, can in some markets produce destabilising and harmful momentum effects – cycles of over and then under valuation. Such swings can be explained by the insights of behavioural economics – human tendencies, rooted in our evolutionary history, which condition us to be swept along with herd psychology²⁷, or they can be explained in terms of relationships between different market participants, operating under conditions of inherent irreducible uncertainty, imperfect information and complex principal/agent relationships, which make it rational for individual participants to act in ways which produce collective unstable results, with continual oscillations around rational equilibrium levels.²⁸
- And third, an emerging body of analysis which suggests that the multiple and complex principal/agent relationships which exist throughout the financial system, mean that active trading which both requires and creates liquid markets, can be used not to deliver additional value to end investors or users of markets, but to extract economic rent. Additional trading, for instance, can create volatility against which customers then seek to protect themselves by placing value on the provision of market liquidity. The fact that customers place great value on market liquidity, and thus support large market-making profits, therefore in no way proving that the increased trading activity is value added at the social level.

So faced with these two schools of thought – what should we conclude? Has all the increased trading activity of the last 30 years delivered economic value via lower transaction costs and more efficient and liquid markets, or has it generated harmful volatility and enabled market traders to extract economic rent? My answer is that I don't know the precise balance of these possible positives and negatives, because there are many issues of complex theory and empirical analysis not yet resolved and very difficult to resolve. But we certainly need to have the debate rather than accepting as given the dominant argument of the last 30 years which has asserted that increased liquidity, supported by increased position taking, is axiomatically beneficial. And a reasonable judgement on the economic value added of increased liquidity may be that increased liquidity does deliver benefits but subject to diminishing marginal utility, and that the increased financial speculation required to deliver increased liquidity creates an increasing danger of destabilising herd and momentum effects the larger pure financial activity becomes relative to underlying real economic activity (Chart 38).

²⁷ See Kahneman, Slovic and Tversky “*Judgement Under Uncertainty heuristics and biases*” (1982) for discussion of how economic agents made decisions on the bases of rough heuristics, i.e. rules of thumb. The widespread application of these rules by multiple agents can then generate self-reinforcing herd effects.

²⁸ See Vayano and Woolley, *An Institutional Theory of Momentum and Reversal*” (LSE November 2008), and George Soros *The New Paradigm for Financial Markets* (2008).

So that there is an optimal level of liquidity, with increased liquidity and speculation valuable up to a point but not beyond that point, but with the complication for practical policy makers that the point of optimal benefit is impossible to define with any precision, that it varies by market, and that we have highly imperfect instruments through which to gain the benefits without the disadvantages. There is, for instance, no economic value that I can discern from the operation of speculators in currency ‘carry trades’, which are among purest examples of what Professor John Kay labels ‘tailgating strategies’ – riding an unsustainable trend in the hope that you will be clever enough to get out just ahead of the crash.²⁹ But there may be no instruments that can eliminate carry-trade activities without undermining useful Forex market liquidity of value to non-financial corporations.

But the fact that we do not have perfect discriminatory instruments does not mean that a more nuanced assessment of the benefits of market liquidity will have no implications for public policy. Instead three implications follow:

- The first is that in setting trading book capital requirements for commercial and investment banks, we should shift from a bias in favour of liquidity to a bias to conservatism. If regulators believe that the level of capital required for prudential purposes needs to increase, and the industry argues that this will restrict liquidity in some specific markets, we should be more willing to question whether the liquidity serves a useful economic purpose and more willing in some cases to wave it goodbye.
- The second is that policymakers need to be concerned with the potential danger of destabilising speculative activity, even if it is performed by non-banks. Speculative trading activity can cause harm, even when it poses no threat to commercial bank solvency. If necessary, highly leveraged hedge fund speculation should be constrained by leverage limits.
- And third, we should certainly not exclude the potential role for financial transaction taxes which might, in James Tobin’s words, ‘throw some sand in the wheels’ of speculative activity. It may well be the case that a generalised and internationally agreed financial transactions tax, whether on Forex flows or on a wider set of financial transactions, is not achievable. One of the interesting features of the transaction tax debate is that it is littered with articles by academics who have been convinced of the theoretical case in favour of a financial transaction tax, but who have subsequently failed to promote the idea. In 1989, Larry Summers co-authored an article entitled: *When financial markets work too well: a cautious case for a securities transaction tax*³⁰, but in office subsequently he did not pursue it.

²⁹ See John Kay, *Tailgating blights markets and motorways*, Financial Times, January 19, 2010.

³⁰ L.H Summers and V.P. Summers, *Journal of Financial Service Research*, 1989.

Rudi Dornbusch argued in 1990 that ‘it’s time for a financial transactions tax’, but was subsequently sceptical about the feasibility of comprehensive capital controls.³¹ But at very least we should take financial transaction taxes out of the ‘index of forbidden thoughts’

6. Reforming Global Finance: Radicalism, structural solutions and inherent instability

Let me sum up then and draw some overall conclusions about the need for radical reform, and what we should mean by radical. I started by describing the quite startling increases in the scale of the financial system which have occurred over the last 30 to 50 years, and I have then considered the value added of this increased financial activity under three headings.

- First, the huge growth in of bank balance sheets relative to GDP, and in the level of leverage in the real economy. Here I concluded that whether this increase was value added depends crucially on the economic and social functions which credit performs, that these functions vary by category of credit, and that whereas some credit extension could be understood in terms of a model in which more credit (or a lower cost of credit) enabled the undertaking of more productive investments, in fact much credit (for instance most mortgage credit), plays the economic functions of enabling life-cycle consumption smoothing and inter-generational resource transfer, is valuable to the extent that such smoothing delivers welfare benefits, but should not be expected to spur investment or long term economic growth. I also argued that credit extension to finance real assets, such as property, can be subject to self-reinforcing and potentially unstable cycles, particularly given the corporate tax deductibility of interest payments and the existence of limited liability. I therefore argued that we need to recognise the credit/asset price cycle as a crucial economic variable, and that we need new macro-prudential policy tools to manage that cycle. Tools which may need to be differentiated by category of credit, given the hugely different elasticity response of different categories and their different economic and social value.
- Second, I looked at the growth of complex securitisation, the growing role of tranching and pooled credit securities within total credit supply, and again concluded

³¹ Rudiger Dornbusch, “*It’s time for a financial transactions tax*”, *The International Economy*, August/September 1990. Note that while Dani Rodrik has argued that Dornbusch’s subsequent scepticism about capital controls (“Capital controls: an idea whose time is past” 1997) is inconsistent with Dornbusch’s earlier position, in fact it is quite possible to be opposed to legislated prohibition of capital flows but in favour of taxing them .

that the economic and social value of these innovations depended crucially on the value of the credit extension which it enabled. I also stressed the danger that a securitised system of credit extension can make credit assessments and pricing decisions increasingly self-referential, and that mark-to-market accounting of credit securities can reinforce pro- cyclical tendencies in credit extension, both in its securitised and its on- balance sheet form. What makes the latest financial crisis so severe was therefore the interaction between the specific features of maturity transforming banks and of traded credit securities markets. Banks are special because they can create both money and credit in a self-reinforcing fashion; credit securities markets can be subject to cycles in which credit assessment and pricing become self referential. Either can introduce volatility into the financial system; but it is their interaction which maximises that volatility. This interaction, I argued, increases the importance of effective macro-prudential tools.

- Finally, I considered the huge growth of trading activity, across multiple markets, relative to underlying real economic variables, and argued that we must reject the efficient market hypothesis that more trading and more market liquidity is axiomatically beneficial, working instead on the assumption that position taking which supports liquidity is valuable up to a point but not beyond that point. I therefore argued for a bias to conservatism in the setting of capital requirements against trading activities, a greater willingness to accept that in some circumstances there can be a case for restricting specific categories of trading activities, and for the removal of the idea of financial transaction taxes from the ‘index of forbidden thoughts’.

Overall therefore, I am arguing for a radical reassessment of the too simplistic case in favour of financial liberalisation and financial deepening which strongly influenced official policy in the decades ahead of the crises, and which reflected the dominant conventional wisdoms of neoclassical economics.

We need to challenge radically some of the assumptions of the last 30 years and we need to be willing to consider radical policy responses. Those radical responses, however, are not necessarily those, or not only those, often defined as radical in current debates.

In those debates many commentators have tended to define radicalism along three specific dimensions.

- How far we go in addressing the “Too Big To Fail” problem, by making large banks resolvable or if necessary smaller.
- Whether we are willing to separate “casino banking”, i.e. proprietary trading, from utility or commercial banking.

- And whether we embrace major structural reforms to create narrow banks or limited purpose banks of the sort proposed by Professors John Kay and Laurence Kotlikoff.

But the implication of this chapter is that none of these structural solutions will be sufficient to address the potential for instability inherent in the specific characteristics of financial markets, credit contracts, and maturity transforming banks.

- Addressing “Too Big To Fail”. The “Too Big To Fail” agenda is undoubtedly important and a key focus for the Financial Stability Board’s Standing Committee on supervisory and regulatory cooperation which I chair. It is not acceptable that tax payers have to bail out large failing banks, and the ex-ante expectation that they will undermines market discipline. In the latest crisis as in previous ones, however, direct tax payer costs of bank rescue are likely to account for only a very small proportion of the total economic costs. IMF estimates suggest they are unlikely to exceed 2-3% of GDP in the developed economies most affected by the crisis, and they may turn out significantly less once bank equity stakes are sold³². But public debt burdens in the developed economies are likely, as a result of this crisis, to increase by something like 50% of GDP. These much larger costs derive essentially from volatility in credit supply, first extended too liberally and at too low prices – especially to real estate and construction sectors – and then restricted. This has two implications. The first is that when we say that in future all banks, however big, must be allowed to “fail”, the objective should not be to put them into insolvency and wind-up, since that will produce a sudden contraction of lending, but instead to ensure that we can impose losses on subordinated debt holders and senior creditors sufficient to ensure that the bank can maintain operations, under new management, without tax payer support. The second is that the multiple failure of small banks could be as harmful to the real economy as the failure of one large bank, even if all such banks failed at no tax payer cost, and even if the market knew ex-ante that no tax payer support would be forthcoming³³. The American banking crisis of 1930-33 was primarily a crisis of multiple relatively small banks.
- Separating commercial from investment banking. Limiting the involvement of commercial lending banks in risky proprietary trading is undoubtedly also desirable. Losses incurred in trading activities can generate confidence collapses, which constrain credit supply and in extremis necessitate public rescue. The interaction between trading activity and classic investment banking played a crucial role in the

³² IMF, *A fair and substantial contribution by the financial sector*, Interim Report for the G-20 (April 2010) estimates that “Net of amounts recovered so far, the fiscal cost of direct support has averaged 2.7% of GDP for advanced G-20 countries.”

³³ See BIS 80th Annual Report, June 2010, p.16. “A financial landscape dotted with a large number of small but identical institutions will be just as prone to collapse as a system with a small number of financial behemoths”.

origins of the latest crisis: indeed, the thesis of this chapter is that it was precisely the interaction of maturity transforming banks and of self-referential credit securities markets, which drove the peculiar severity of this latest crisis. But for three reasons legislated separation of commercial and investment banking will not prove a straightforward nor sufficient solution.

- First because a precise legislated distinction is extremely difficult, as the terms of the “Volcker rule” now introduced in US legislation illustrate. That legislation defines proprietary trading as the purchase or sale or underwriting for profit of any tradable security or contract: but it then exempts from the definition any such position-taking for the purposes of market-making, customer facilitation or hedging, leaving it to regulators to enforce the distinction and to devise tools to prohibit position-taking unrelated to value added activities. Underpinning the authority of regulators with the principle of a legislated Volcker rule may well be desirable; but the implementation of the rule is likely to depend crucially on appropriate design of trading book capital rules.
- Second, because while large integrated commercial and investment banks (such as Citi, RBS and UBS) played a major role in the crisis, so too did large or mid-sized commercial banks (such as HBOS, Northern Rock, and IndyMac) which were not extensively involved in the proprietary trading activities which a Volcker rule would constrain.
- Third, that even if proprietary trading of credit securities was largely conducted by institutions separate from commercial banks, important and potentially destabilising interactions could still exist between maturity transforming banks and credit securities trading. A credit supply and real estate price boom could be driven by the combination of commercial banks originating and distributing credit and non-banks buying and trading it, the two together generating a self-referential cycle of optimistic credit assessment and loan pricing, even if the functions were performed by separate institutions.

Volcker rules are in principle desirable, but not a sufficient response.

- Separating deposit taking from commercial banking. Professor John Kay’s proposed structural solution is quite different from Paul Volcker’s. Rather than splitting commercial from investment banking, it would separate insured deposit taking from lending. All insured retail deposits would be backed 100% by government gilts, while lending banks would be funded by uninsured retail or commercial deposits or by wholesale funds, and would compete in a free, unregulated and unsupervised market. The underlying assumption is that the existing system is unstable only because explicit deposit insurance and implicit

promises of future rescue undermine the market discipline which would otherwise produce efficient and stable results. If instead we believe that financial markets, maturity transforming banks, and credit extension against assets which can increase in value, are inherently susceptible to instabilities which cannot be overcome by identifying and removing some specific market imperfection, then Professor Kay's proposal fails to address the fundamental issues. It would create safe retail deposit banks which would never need to be rescued, but it would leave credit supply and pricing as volatile, pro-cyclical and self-referential as it was pre-crisis.

- Abolishing banks: 100% equity support for loans. Professor Kotlikoff's proposal, in contrast, suggests a truly radical reform of the institutional structure for credit extension. Lending banks would become mutual loan funds, with investors sharing month by month (or even day by day) in the economic performance of the underlying loans. This is equivalent to making banks 100% equity funded, performing a pooling but not a tranching function. And it would clearly exclude the possibility of publicly funded rescue: if the price of loan fund assets fell, the investors would immediately suffer the loss. But it is not clear that such a model would generate a more stable credit supply. As Section 4 argued, a system of securitised credit combined with mark-to-market accounting can generate self-referential cycles of over and under confidence. And while Kotlikoff's loan funds might seem to abolish the maturity transforming bank, with investors enjoying short term access but not capital certainty, investors would be likely in the upswing to consider their investments as safe as bank deposits. Investments in loan funds would therefore be likely to grow in a procyclical fashion when valuations were on an upswing and then to "run" when valuations and confidence fell, creating credit booms and busts potentially as severe as in past bank-based crises. The essential challenge indeed is that the tranching and maturity transformation functions which banks perform do deliver economic benefit, and that if they are not delivered by banks, customer demand for these functions will seek fulfilment in other forms. We need to find safer ways of meeting these demands, and to constrain the satisfaction of this demand to safe levels, but we cannot abolish these demands entirely.

There is therefore a danger that if radicalism is defined exclusively in structural terms – small banks, narrow banks, or the replacement of banks with mutual loan funds – that we will fail to be truly radical in our analysis of the financial system and to understand how deep-rooted are the drivers of financial instability. An exclusive focus on structural change options, indeed, reflects a confidence that if only we can identify and remove the specific market imperfections which prevent market disciplines from being effective, then at last we will obtain the Arrow-Debreu nirvana of complete and self-equilibrating markets. If instead we believe that liquid financial markets are subject for inherent reasons to herd and momentum effects, that credit and asset price cycles are centrally important phenomena, that maturity transforming banks perform economically

valuable but inherently risky functions, and that the widespread trading of credit securities can increase the pro-cyclicality of credit risk assessment and pricing, then we have challenges which cannot be overcome by any one structural solution.

Instead two elements should form the core of the regulatory response to the crisis: much higher bank capital and liquidity requirements and the development of new macro prudential through-the-cycle tools. Together these can help address the fundamental issues of volatile credit extension and asset price cycles:

- Higher capital and liquidity requirements will create a more resilient banking system, less likely to suffer crisis and bank failure. But they will also, by constraining but not eliminating the extent to which the banking system can perform its tranching and maturity transformation functions, constrain total leverage in the real economy and thereby reduce the vulnerability which derives from the rigidities of credit contracts. And by reducing the likelihood of bank failure, they will reduce the danger that confidence collapse leads to sudden constraints on credit supply. Even if not varied through the cycle, higher bank capital and liquidity requirements will therefore tend to reduce the procyclicality inherent in banking systems and credit markets. In the long run, moreover, there is no reason to believe that a more restricted credit supply and lower financial system and real economy leverage will result in lower steady state growth, given in particular that much credit supply and demand in rich developed countries is unrelated to productive investment, instead performing a different (but still valuable) consumption smoothing effect. While the transition to higher capital and liquidity standards needs to be managed with care, there is therefore a strong argument for long term capital standards which are much higher than pre-crisis, and for liquidity policies which seek deliberately to constrain aggregate maturity transformation well below pre-crisis levels.
- Higher continuous capital and liquidity requirements will still however leave the economy vulnerable to destabilising up-swings in credit supply and asset prices, deriving from the interaction between maturity transforming banks, credit securities markets, and self reinforcing credit and asset price cycles. In addition therefore, the regulatory response needs to involve the deployment of counter cyclical macro-prudential tools which directly address aggregate credit supply. These could include automatic or discretionary variation of capital or liquidity requirements across the cycle, or constraints, such as LTV limits, which directly address borrowers rather than lenders. Such policy levers may moreover need to be varied by broad category of credit (e.g. distinguishing between commercial real estate and other corporate lending) given the very different elasticity of response of different categories of credit to both interest rate and regulatory levers.

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- Vayanos, D. and Woolley, P. (2008), “An Institutional Theory of Momentum and Reversal”, LSE, November.

Chart 1



Linking fund providers with fund users

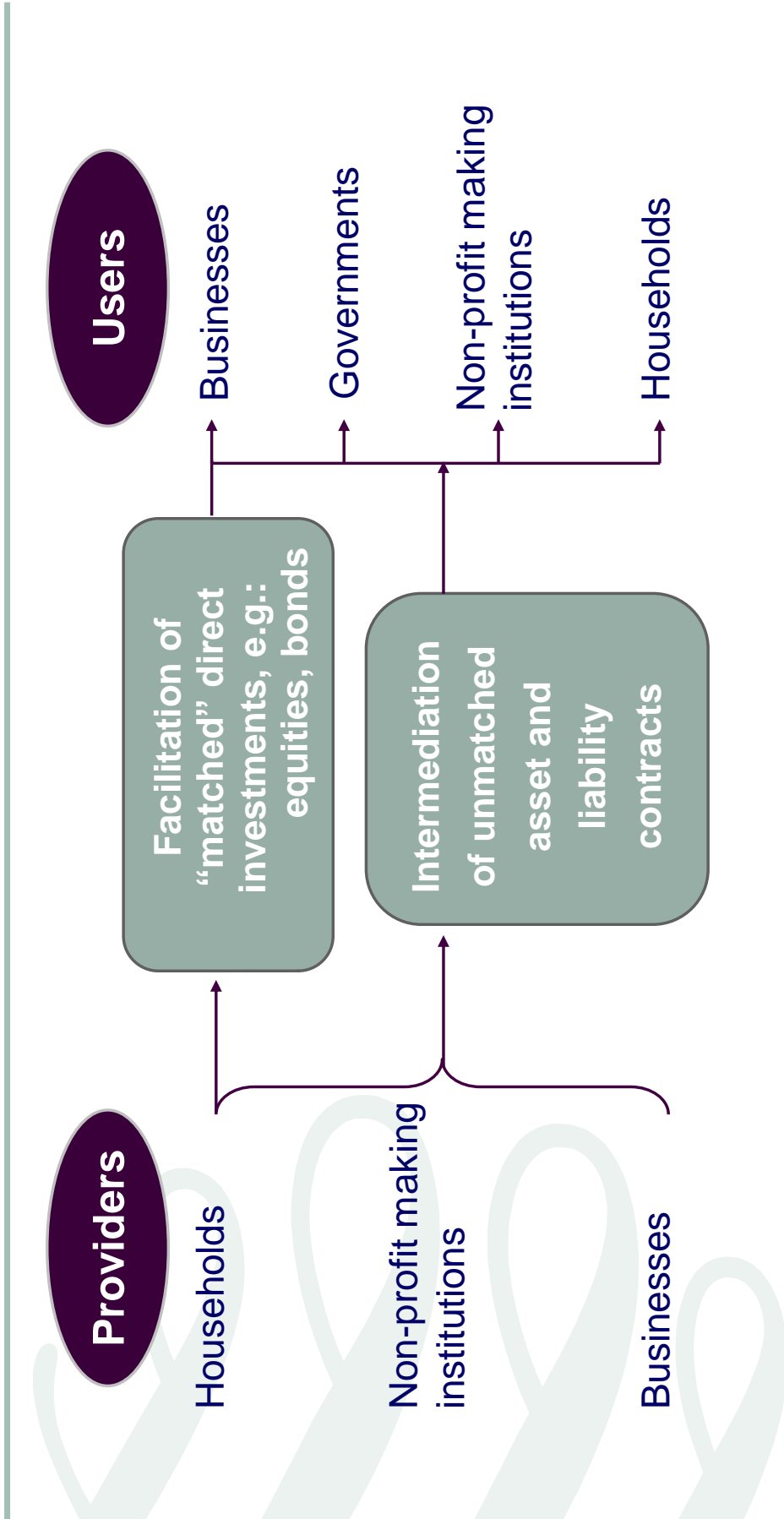


Chart 2



Maturity transformation via bank intermediation

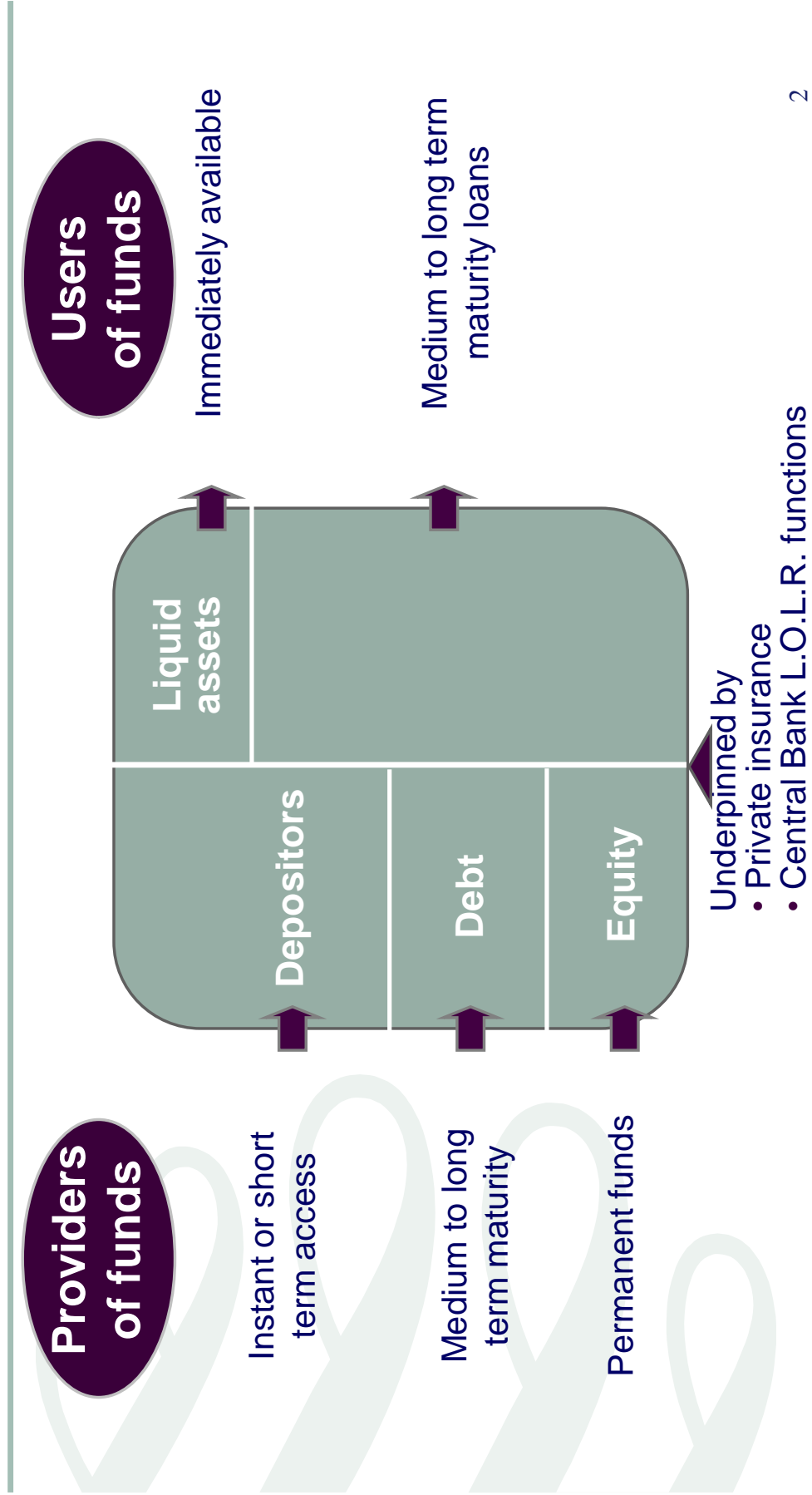


Chart 3



Risk-return transformation via bank intermediation: “Tranching”

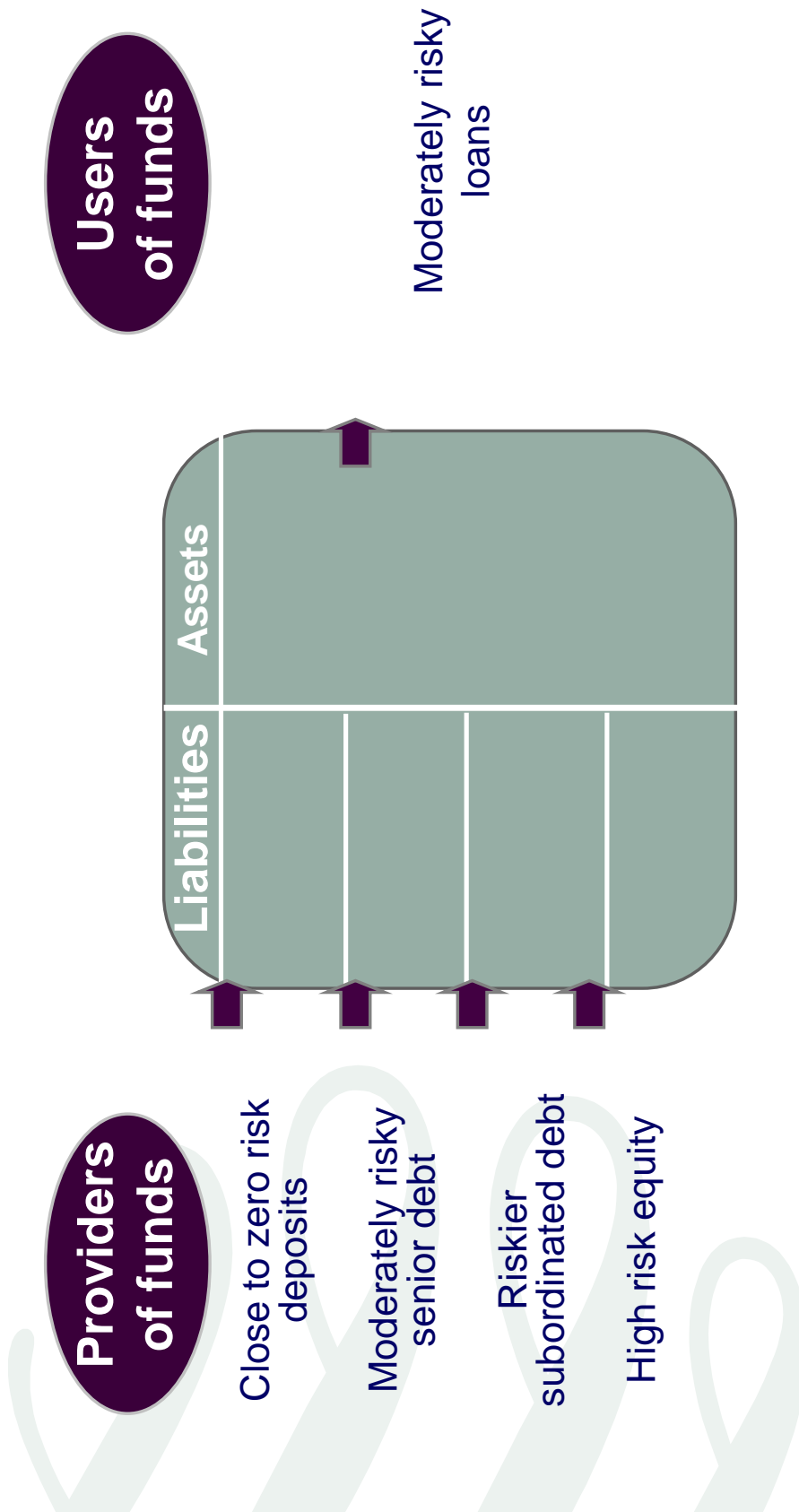


Chart 4



How financial intermediation can add value

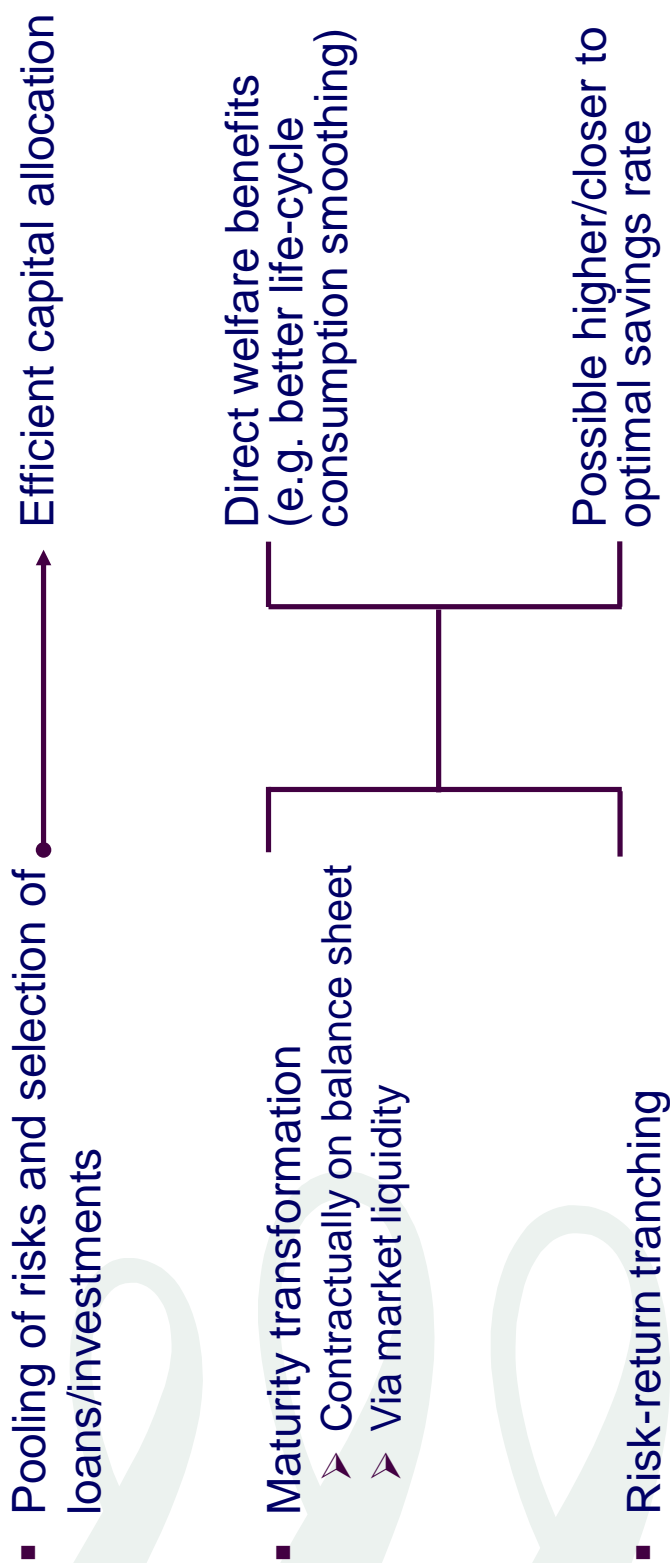


Chart 5



Measures of increasing financial intensity

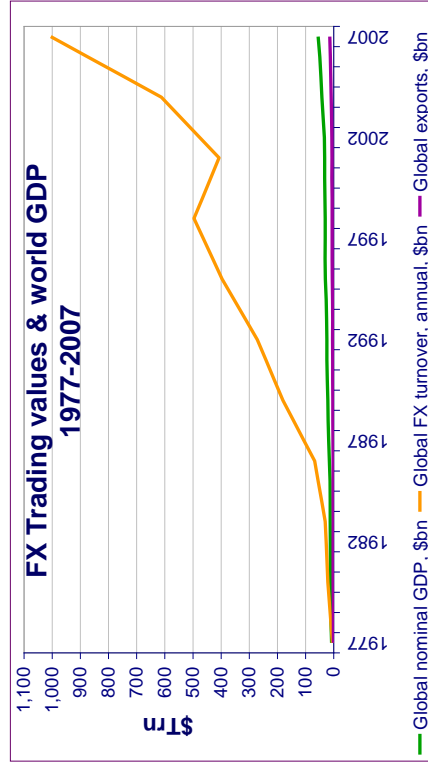
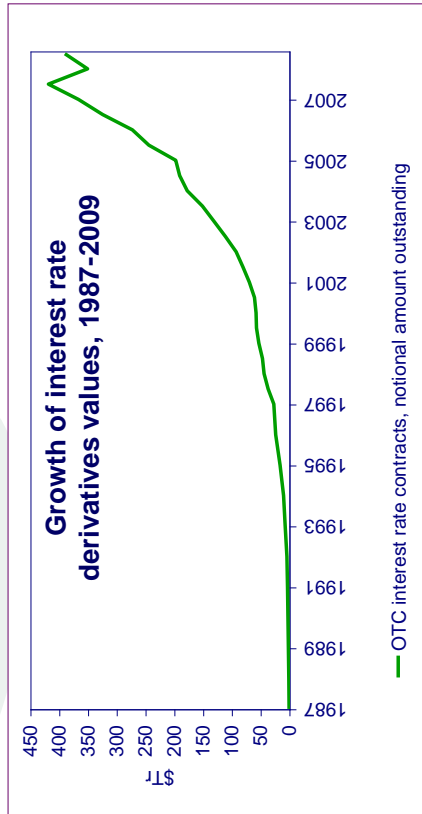
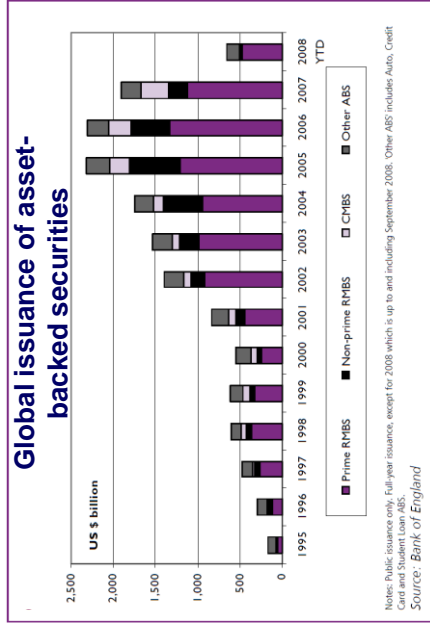
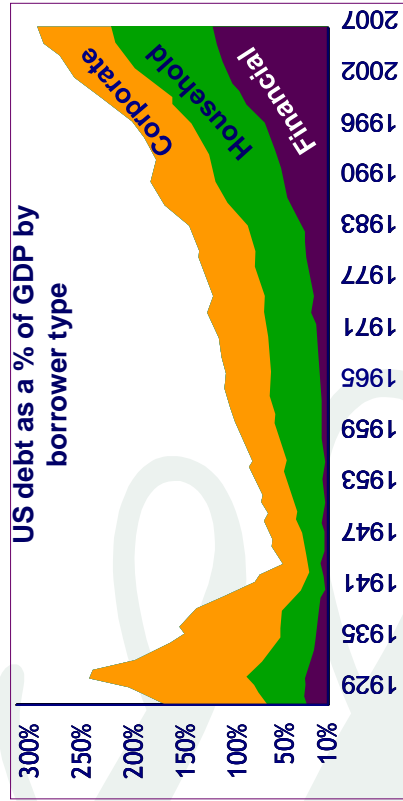
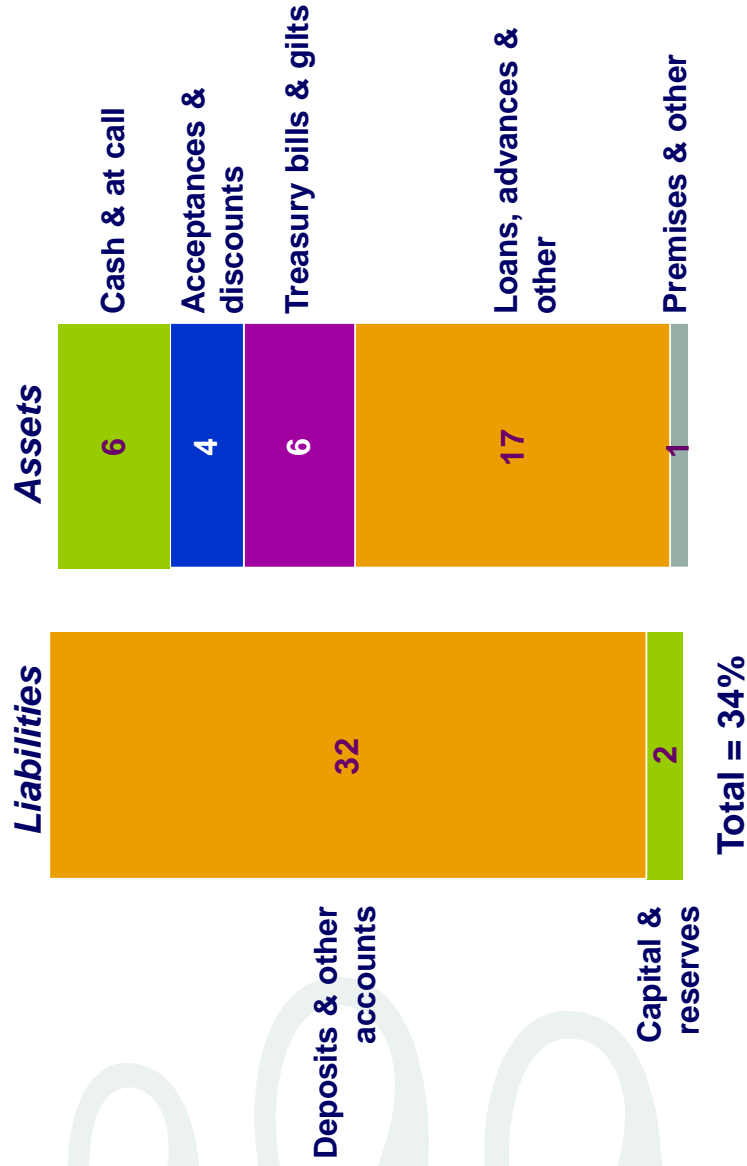


Chart 6



What the UK banking system did: 1964

UK banks' aggregate balance sheet as % of GDP

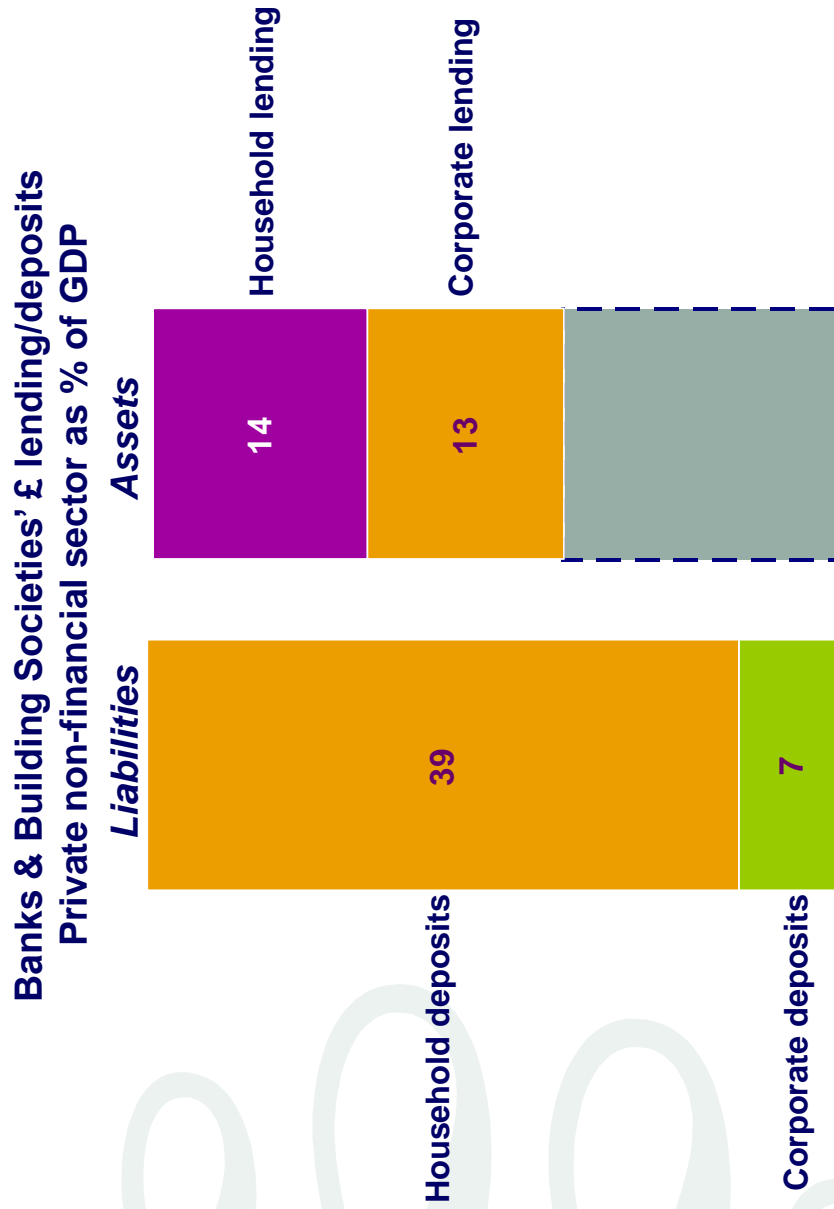


Source: David Sheppard (1971) *The Growth and Rule of UK Financial Institutions 1880-1966*

Chart 7



What the UK banking system did: 1964 (Cont.)

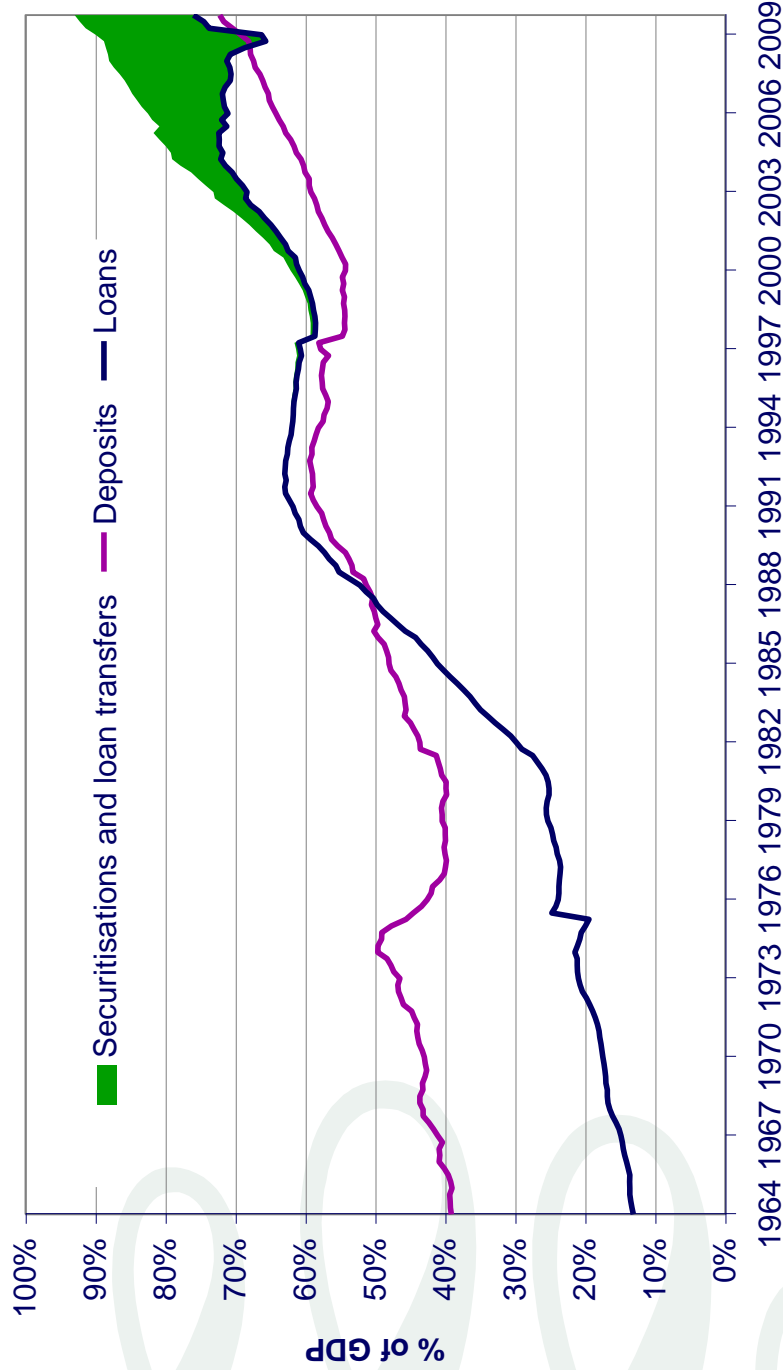


Source: Bank of England

Chart 8



Household deposits and loans: 1964 – 2009

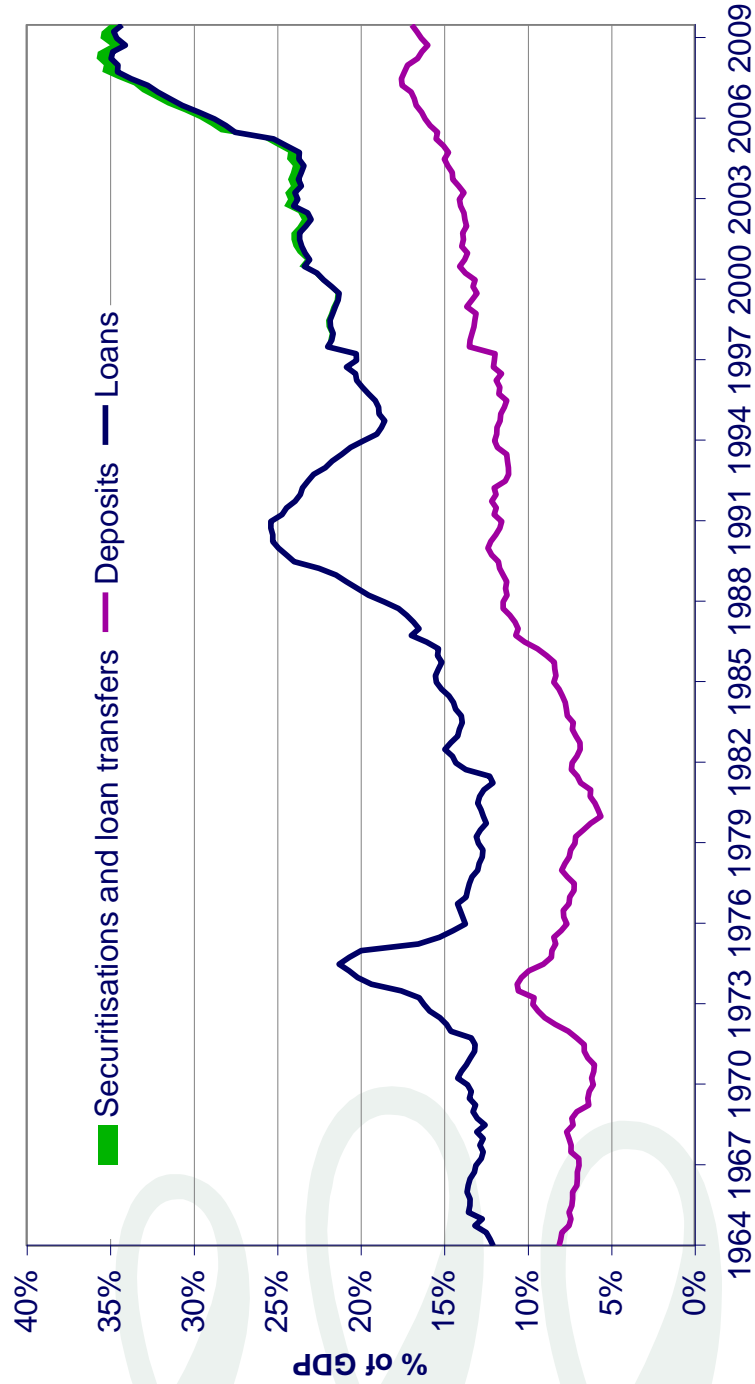


Source: Bank of England, Tables A4.3, A4.1

Chart 9



Private non-financial corporate (PNFC) deposits and loans: 1964 – 2009

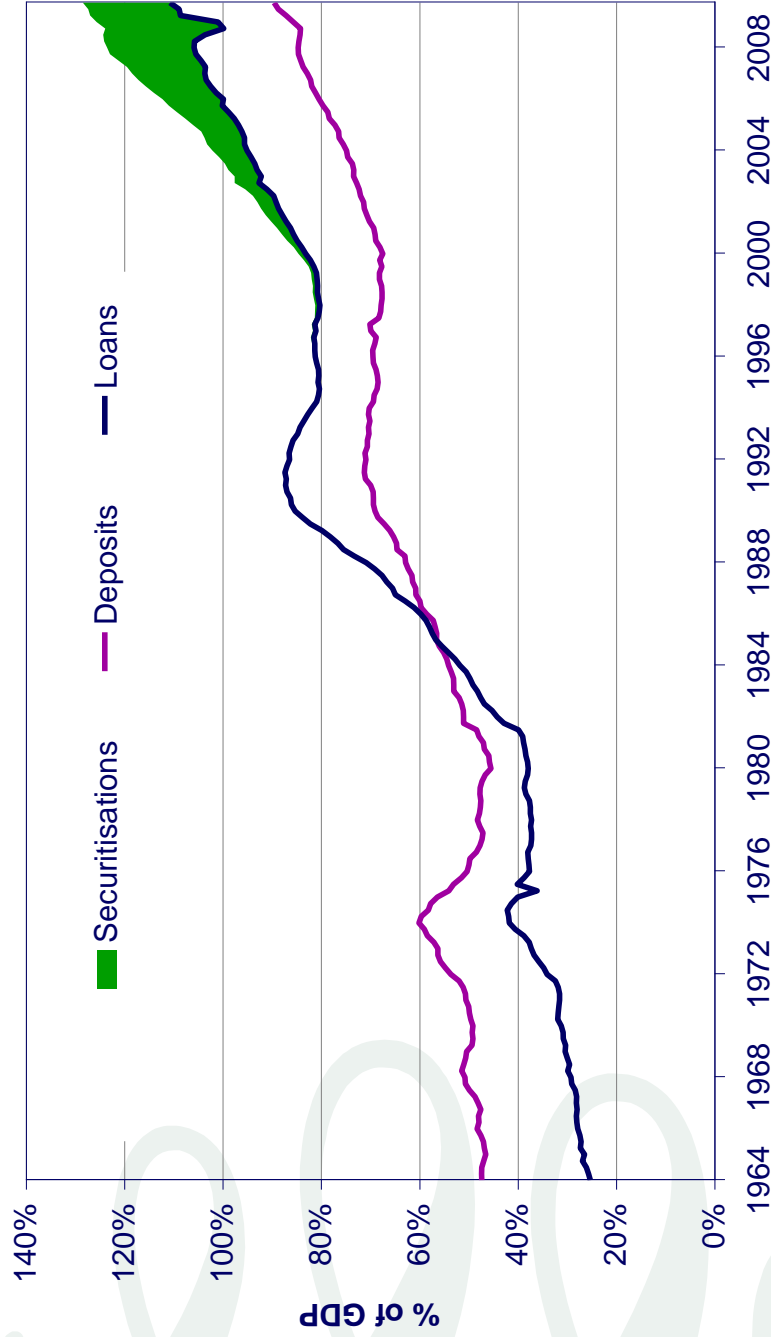


Source: Bank of England Tables A4.3, A4.1

Chart 10



Household and PNFC deposits and loans: 1964 – 2009



Source: Bank of England, Tables A4.3, A4.1

Chart 11



UK banks and building societies £ lending/deposits to/from private non-financial sector: 2007 as % of GDP

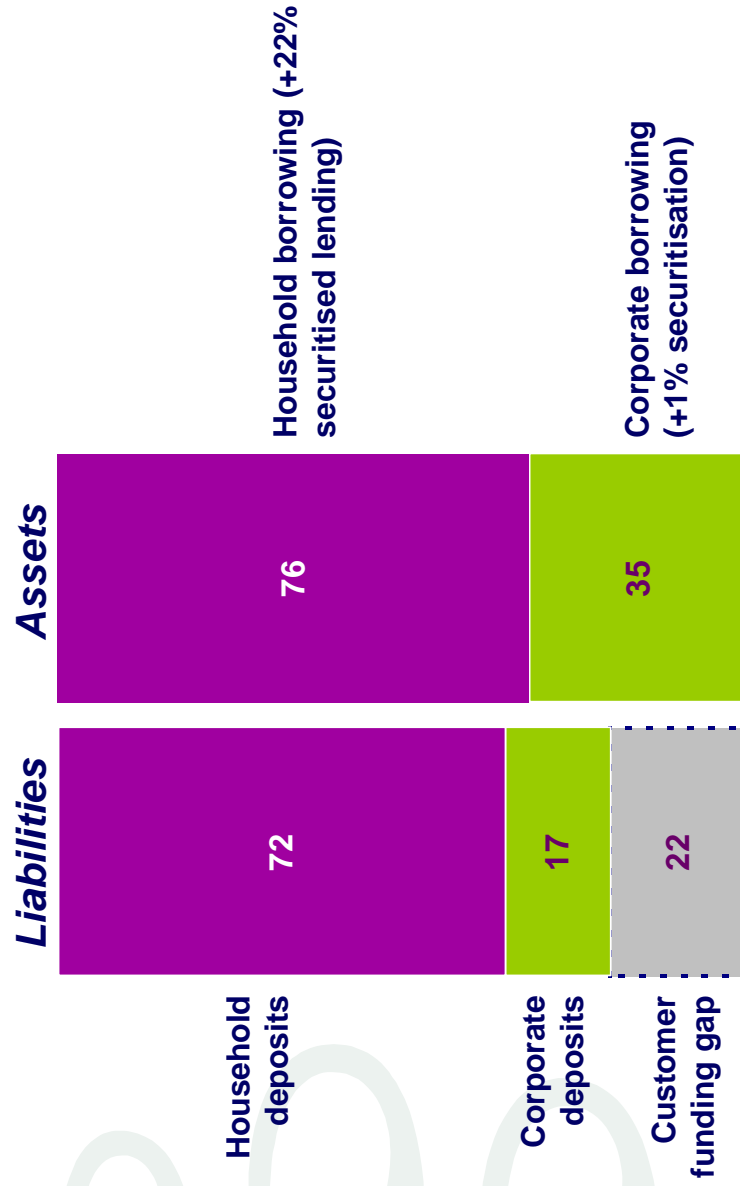


Chart 12



UK bank balance sheets – 2007

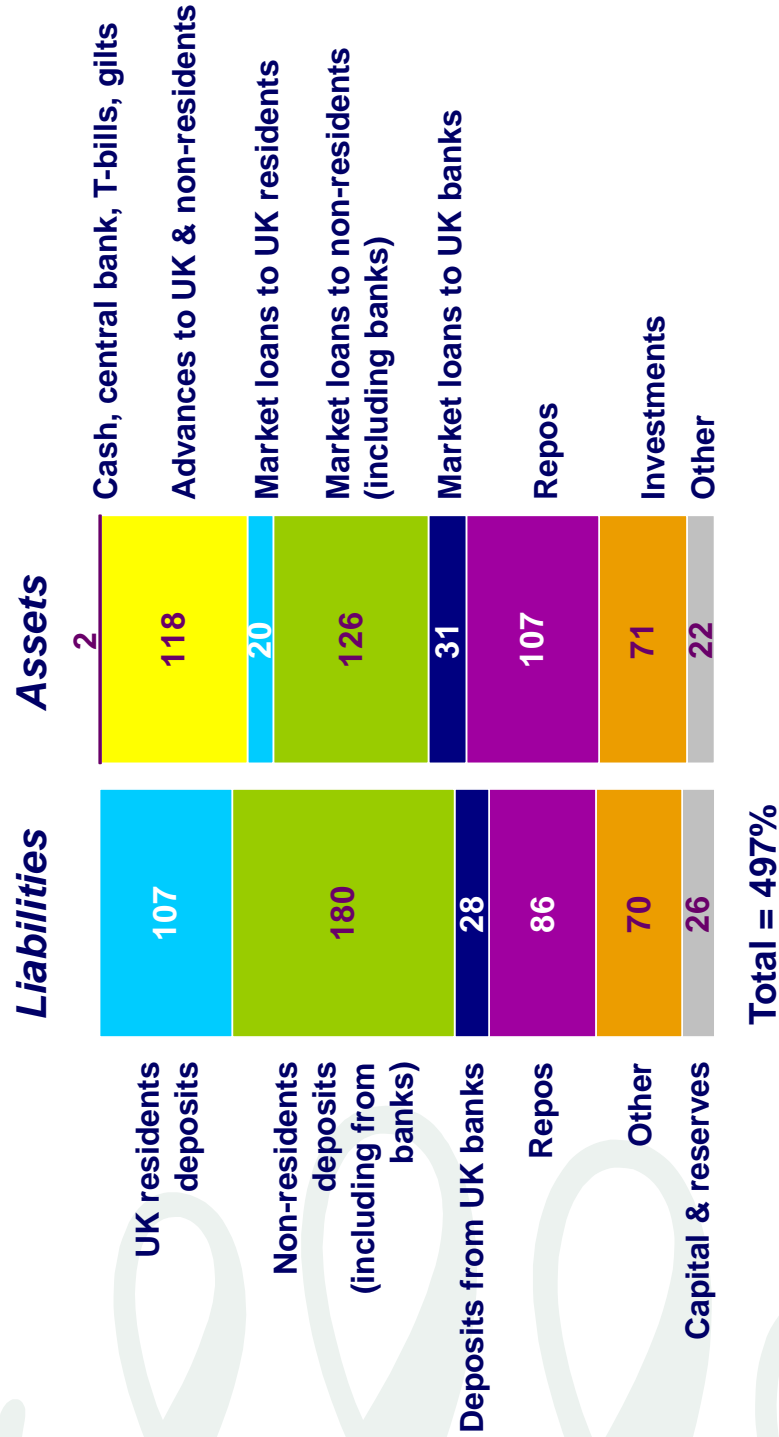
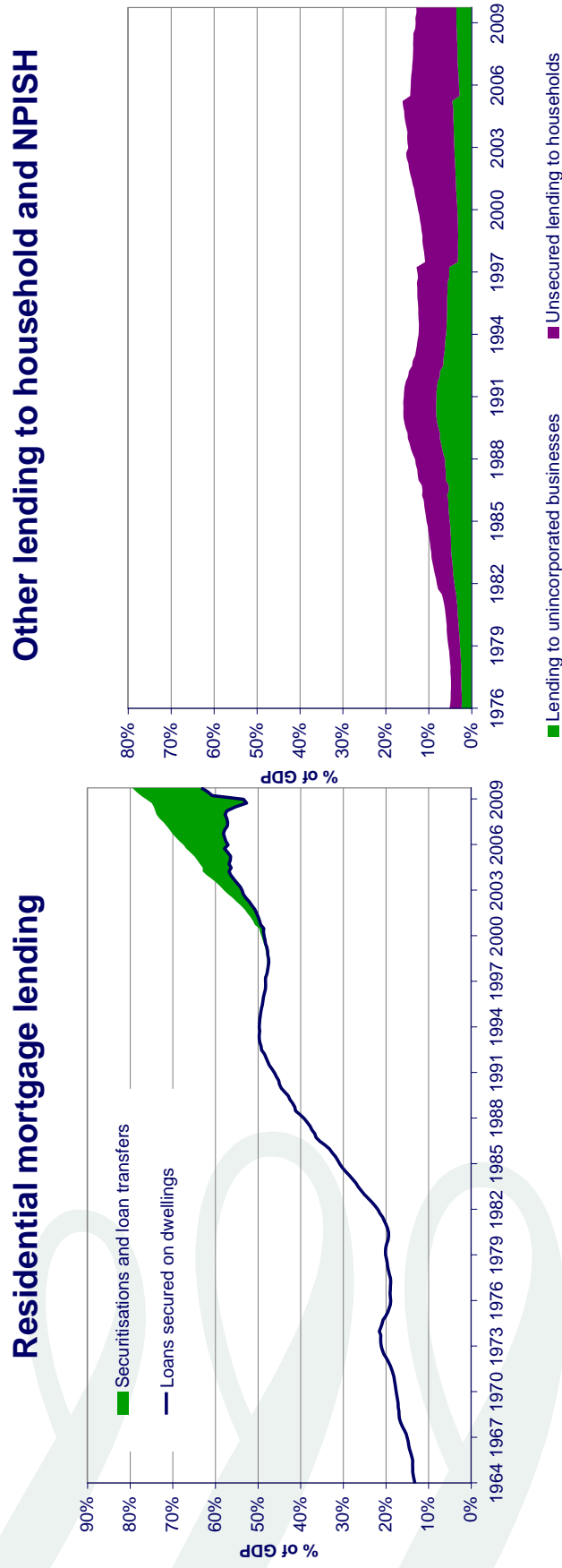


Chart 13



Household and NPISH lending: 1964 – 2009



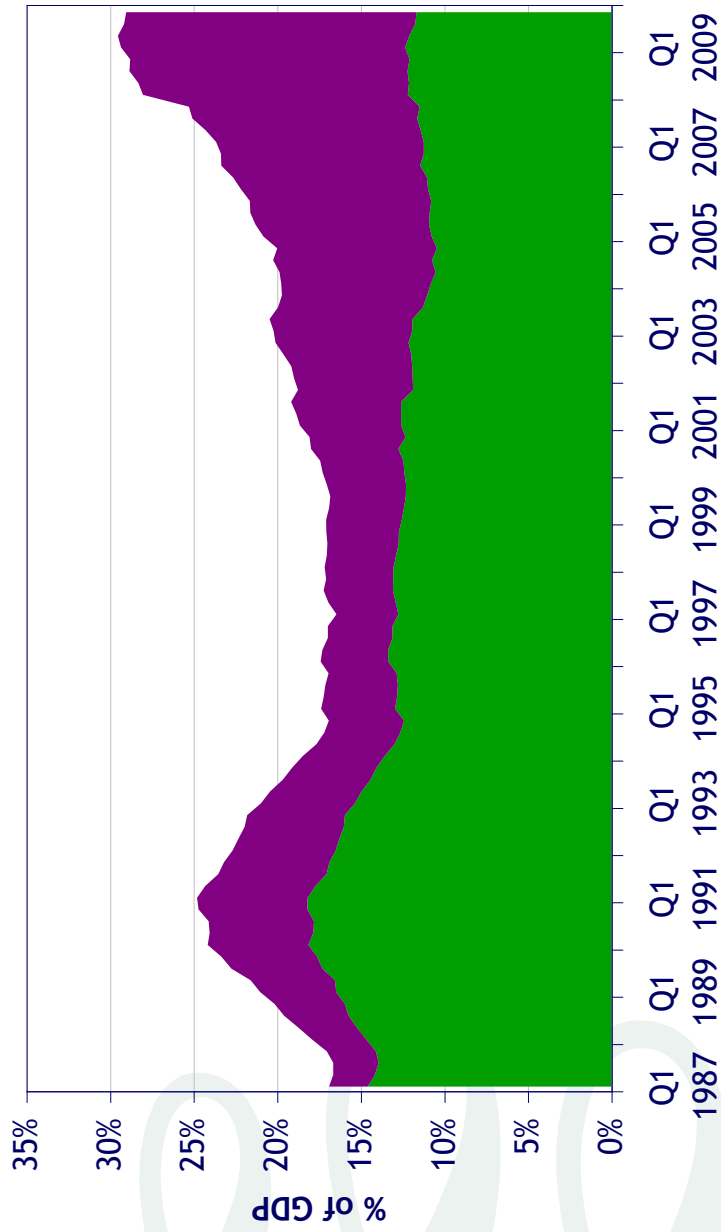
Source: Bank of England, Table A4.1

Source: Bank of England, Tables A4.3, A4.1

Chart 14



Corporate loans by broad sector: 1987 – 2008



■ Non-commercial real estate PNFC lending ■ Commercial real estate lending

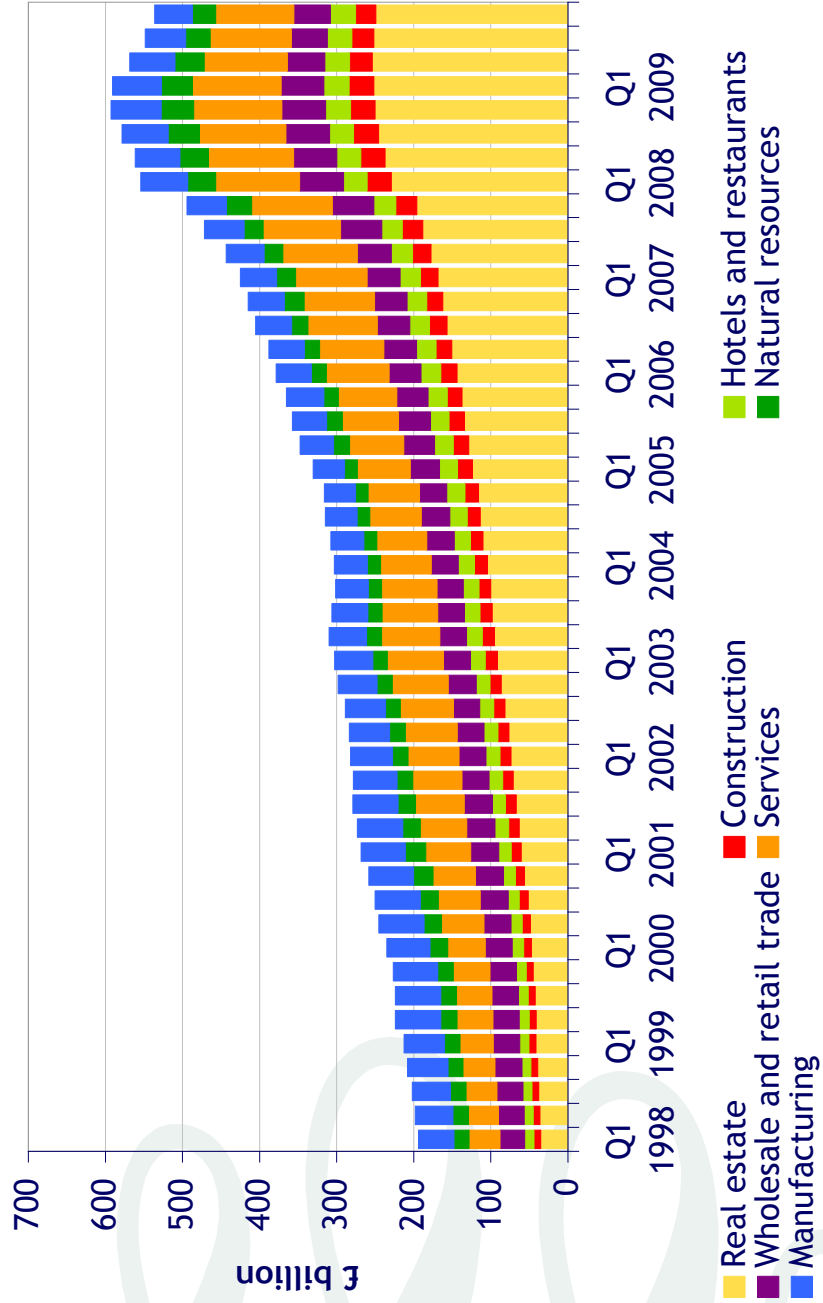
Note: Part of the increase in real estate lending may be due to re-categorisation of corporate lending following sale and lease-back of properties and PFI (public finance initiative) lending, but we do not think these elements are large enough to change the overall picture. Break in series from Q1 2008 due to inclusion of building society data. Sterling borrowing only.

Source: ONS, Finstats

Chart 15



Corporate loans by sector: 1998 – 2008

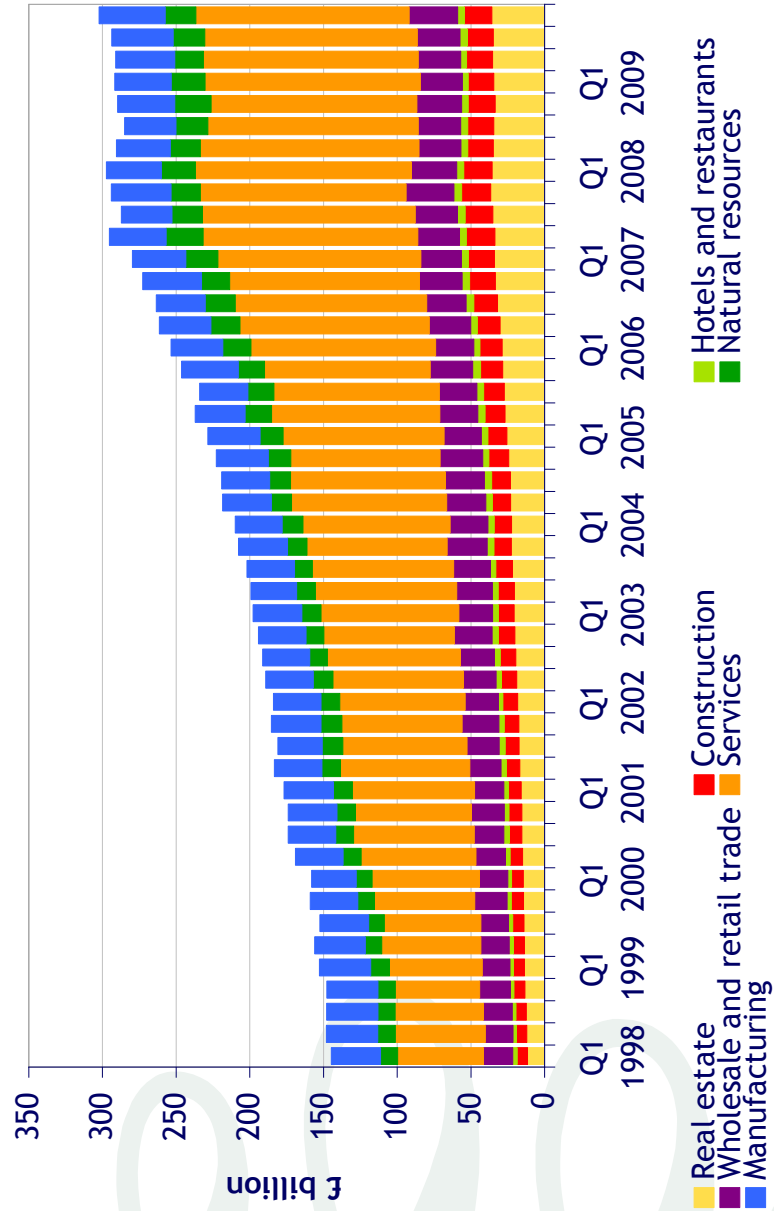


Source: Bank of England

Chart 16



Corporate deposits by sector: 1998 – 2009

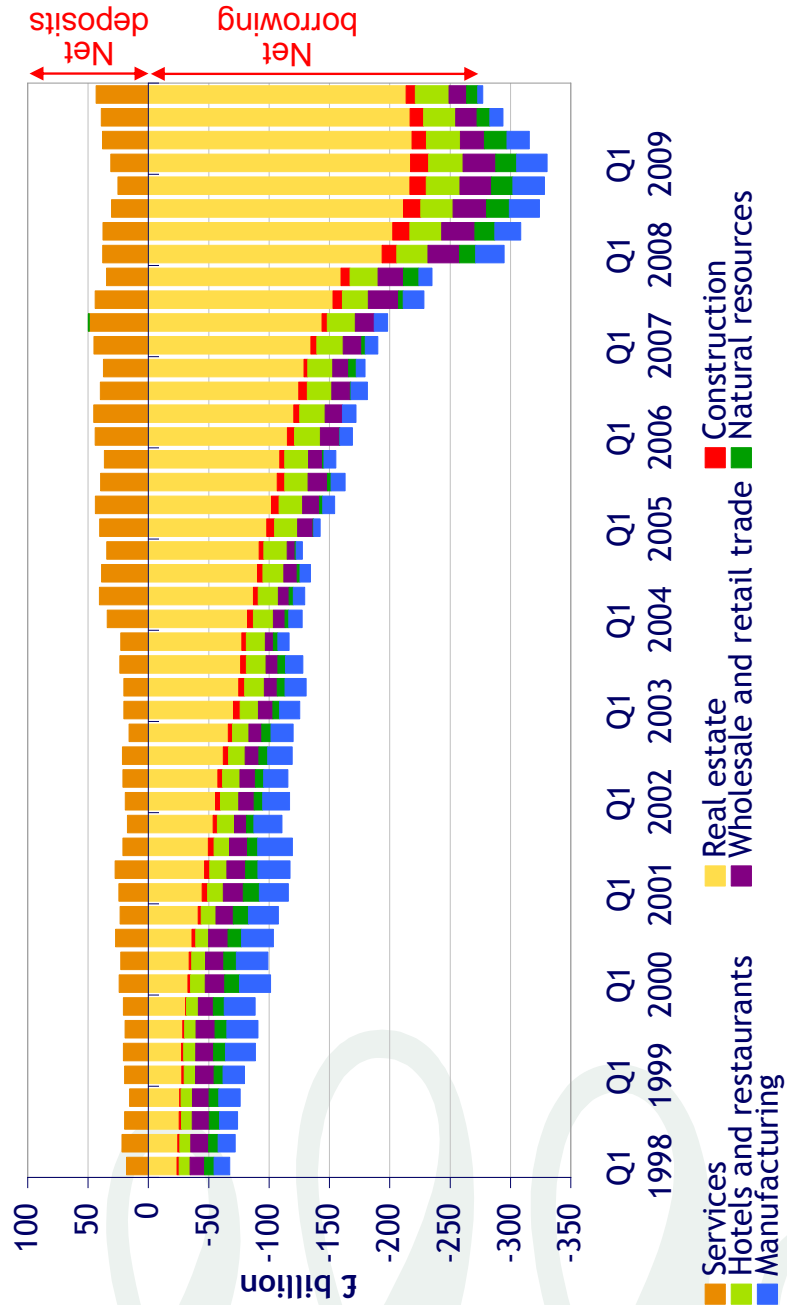


Source: Bank of England

Chart 17



Corporate sector net deposits/borrowing: 1998 – 2009

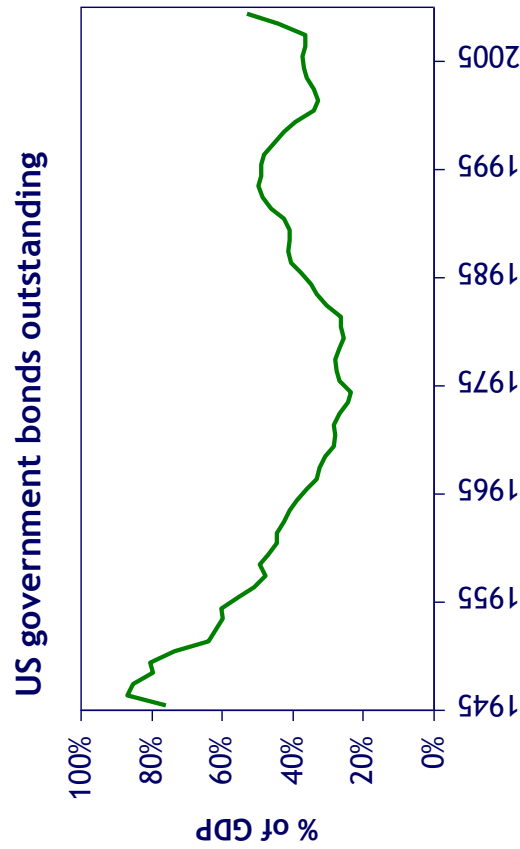


Source: Bank of England

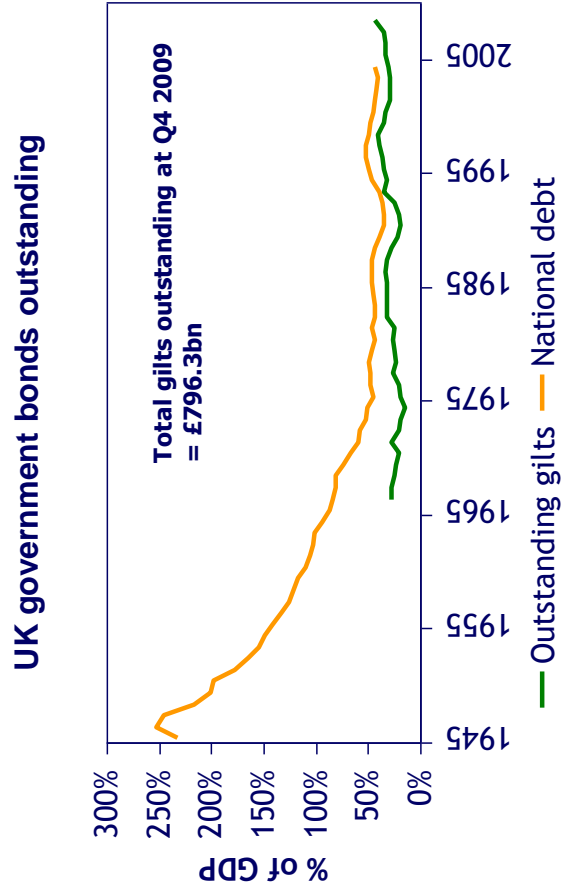
Chart 18



Government bonds outstanding as % of GDP



Source: Federal Reserve Flow of Funds Accounts; Datastream

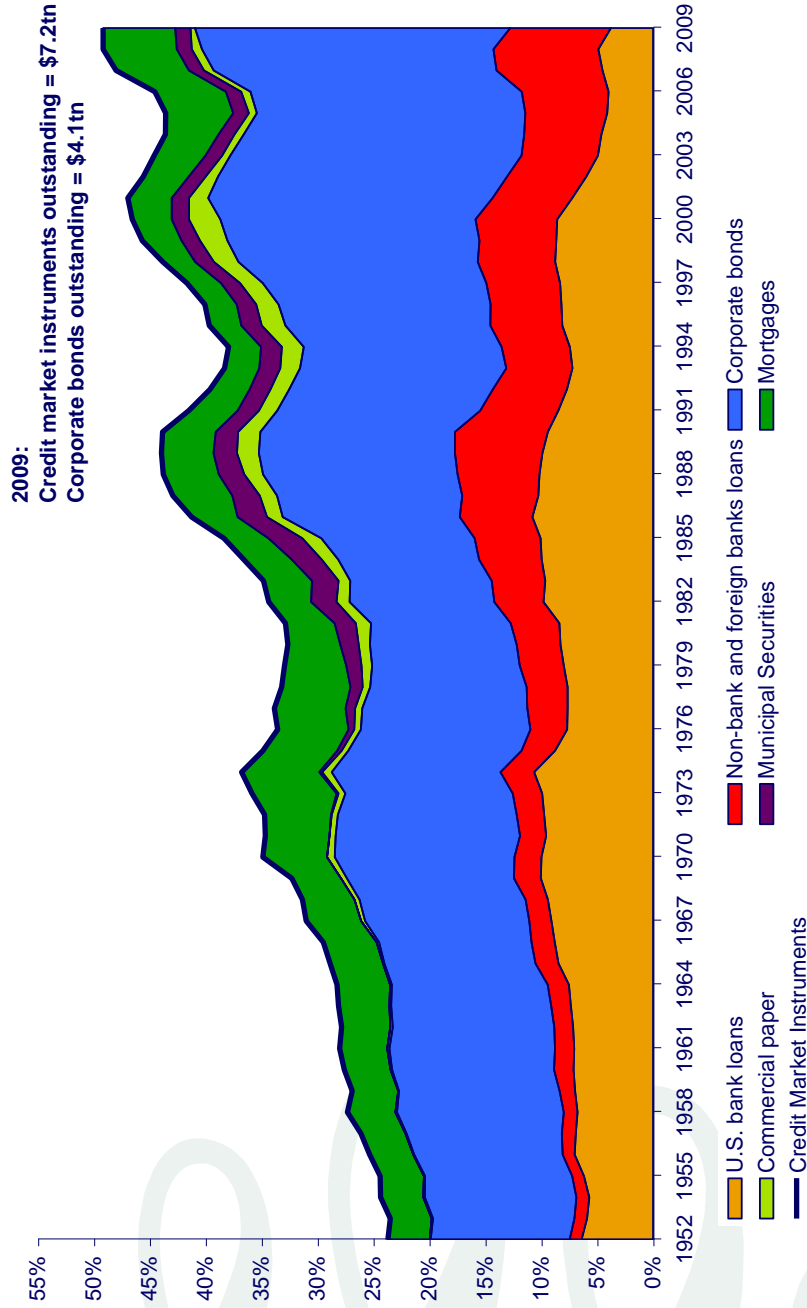


Source: 'National debt' from HM Treasury Public Finances Database; 'Outstanding gilts' from ONS Financial Statistics Consistent; Datastream

Chart 19



US non-financial corporate credit funding: 1952 – 2009 as % of GDP



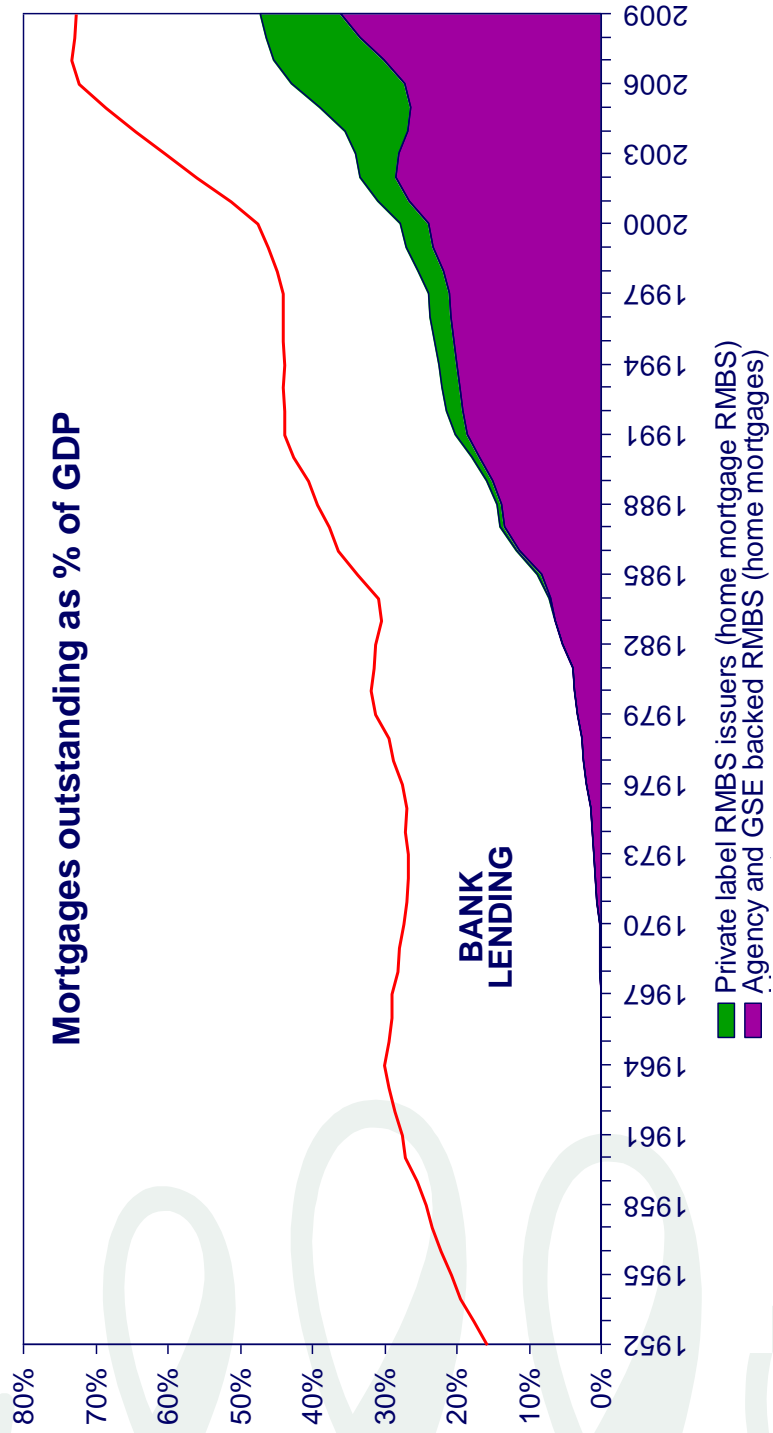
Source: U.S. Flow of Funds.

Note: Municipal securities refers to bonds issued to fund public-private partnerships and are not traditional local government issued securities. Mortgages can be defined as commercial property lending.

Chart 20



Securitisation of US residential mortgages: 1960 – 2009

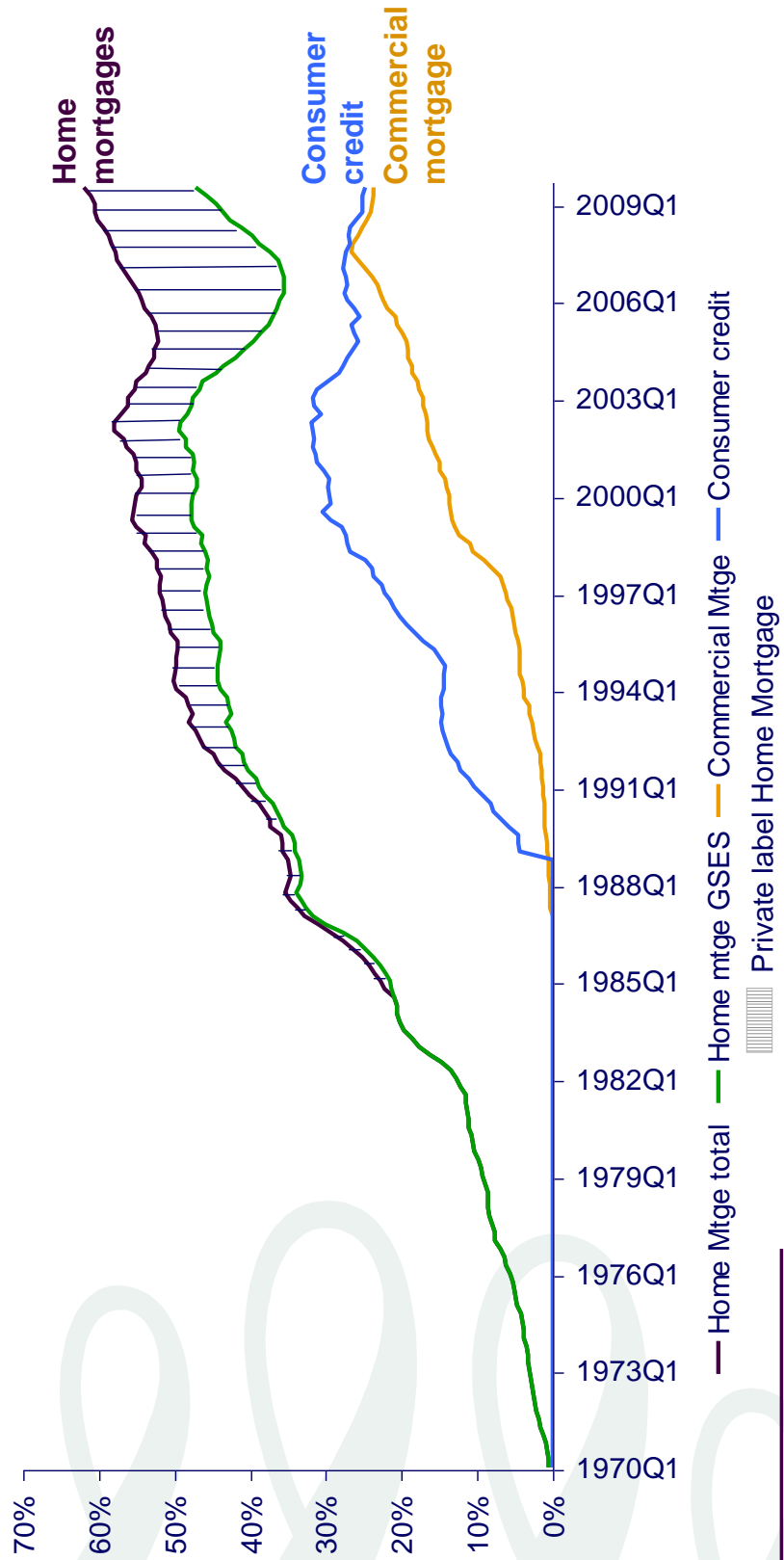


Source: U.S. Flow of Funds

Chart 21



Securitized credit as % of total category: 1970 – 2009



Source: U.S. Flow of Funds

Chart 22



Tranching via securitisation

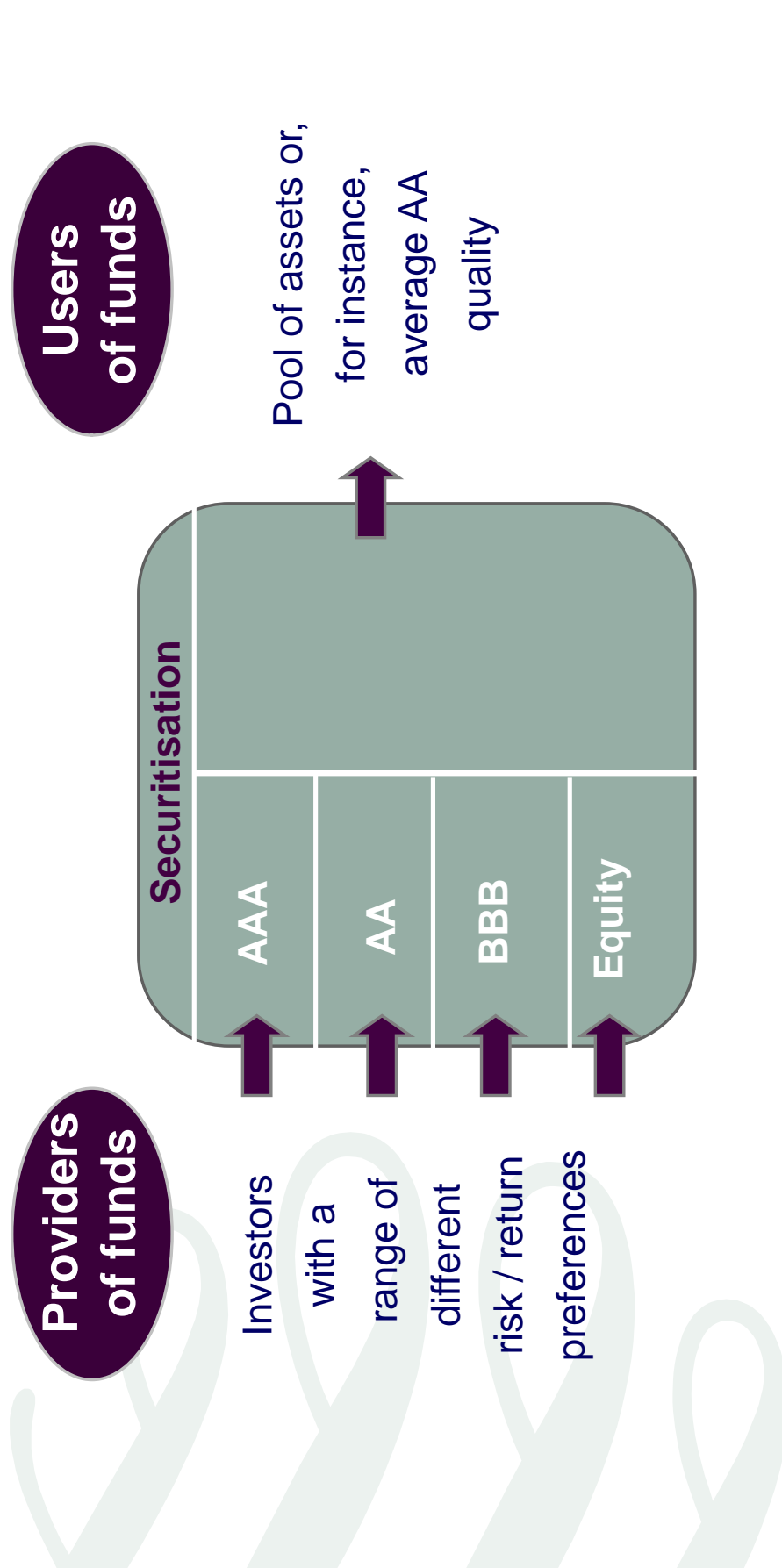
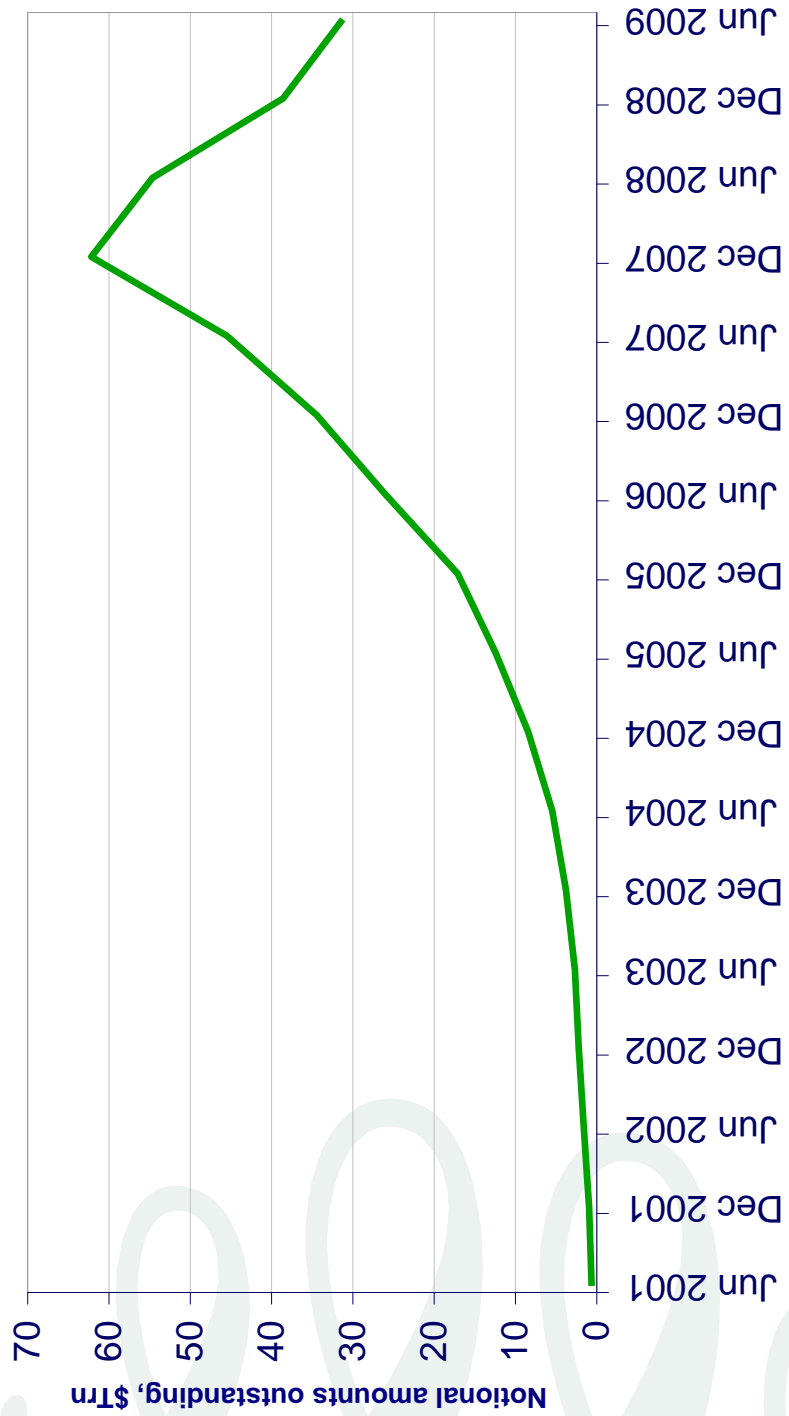


Chart 23



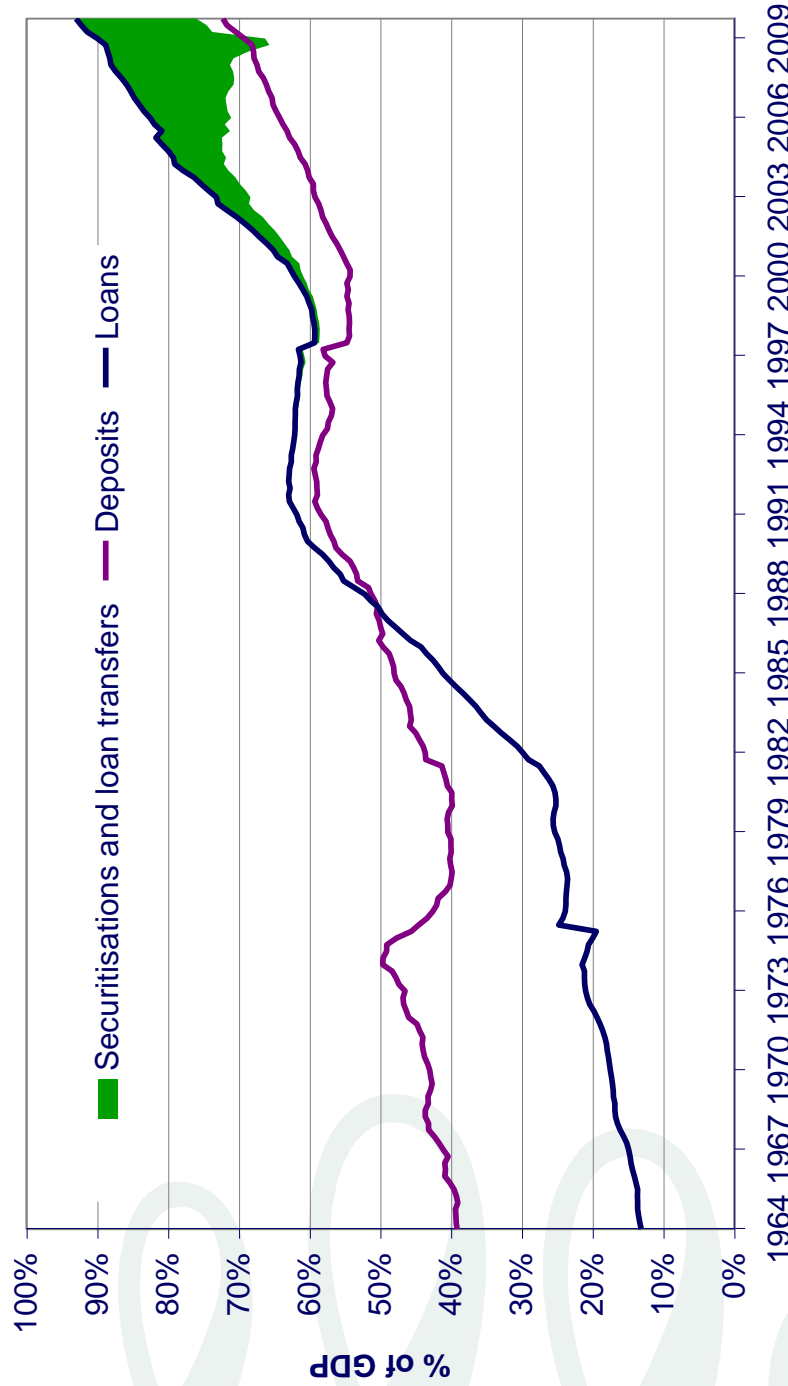
Global credit derivatives outstanding



Source: ISDA Market Survey



Household deposits and loans: 1964 – 2009

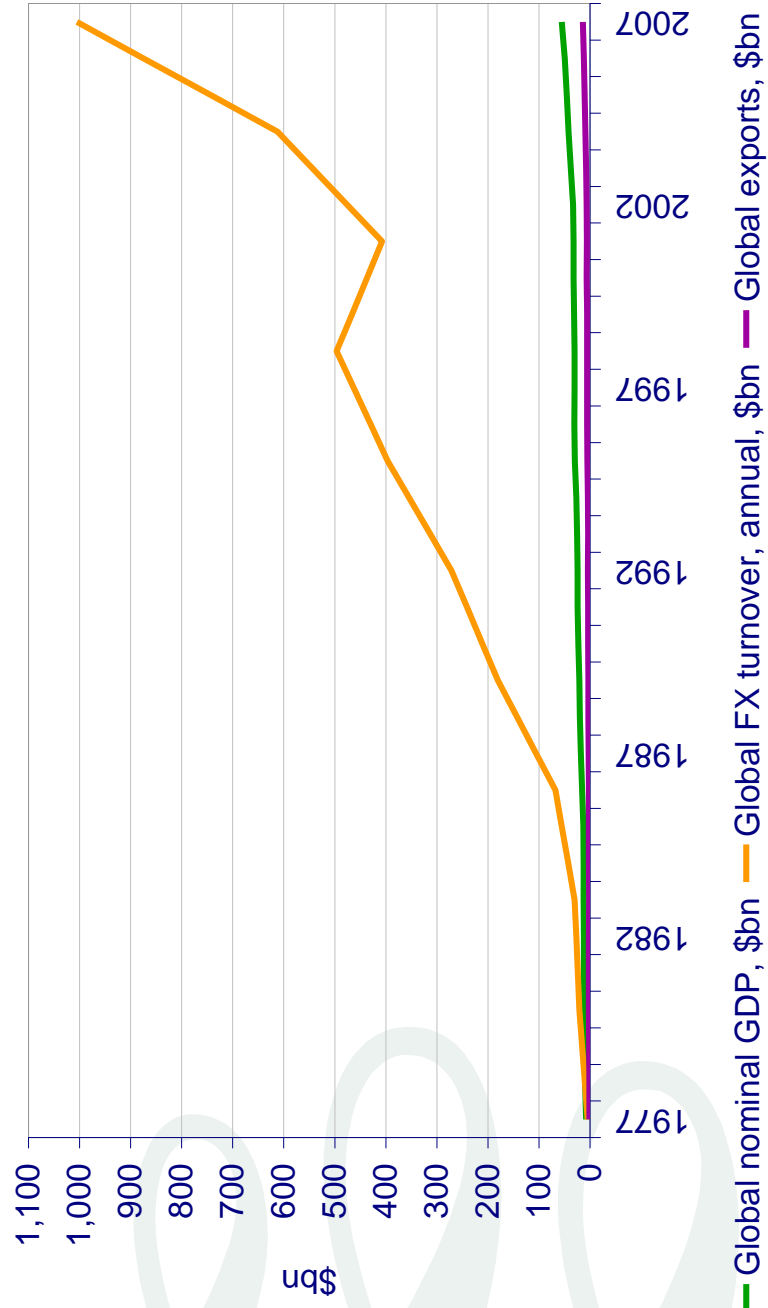


Source: Bank of England

Chart 25



Increased trading activity relative to real economy: FX

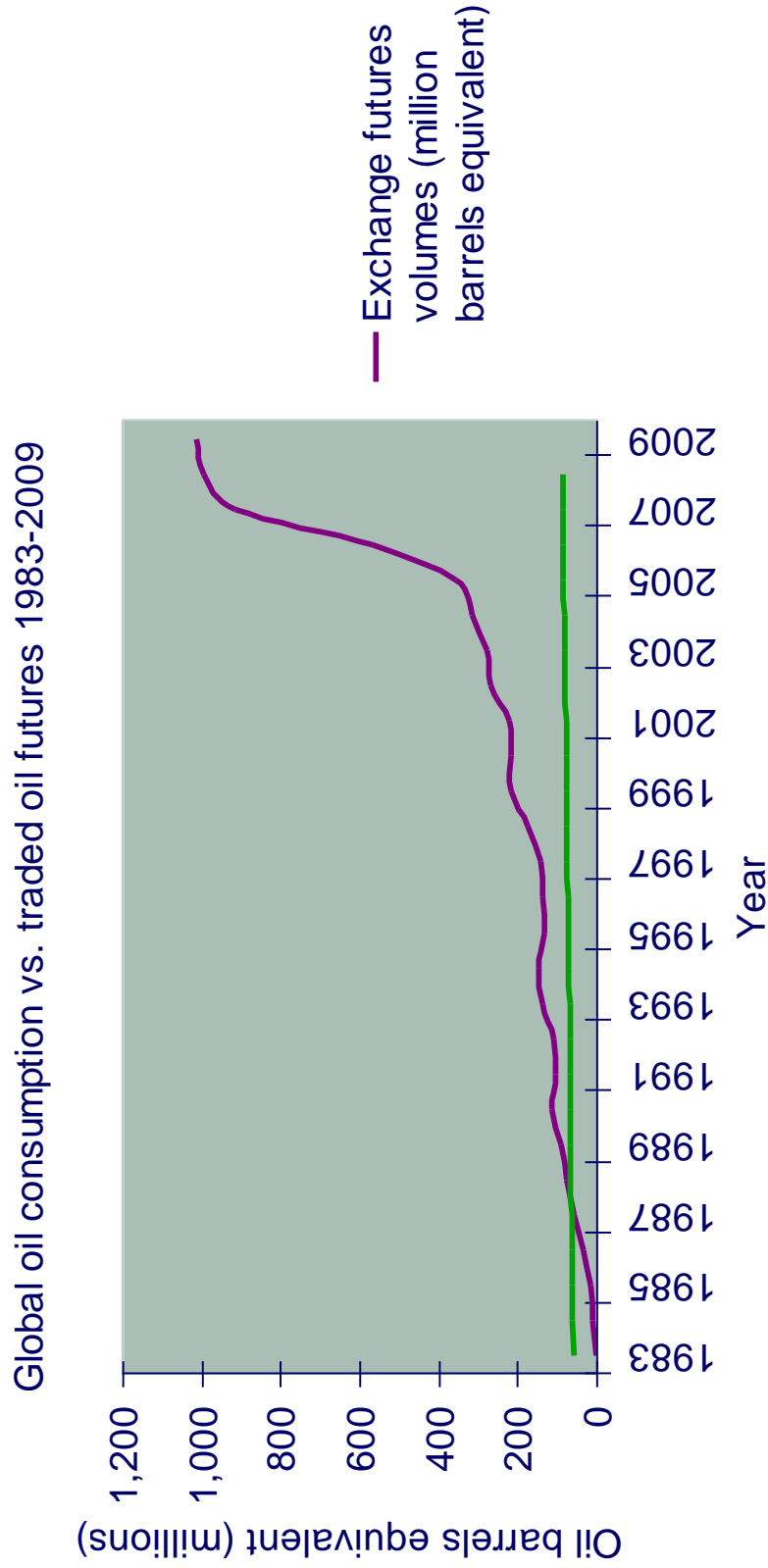


Source: BIS Triennial Central Bank Survey, IMF International Financial Statistics

Chart 26



Increased trading activity relative to real economy: Oil

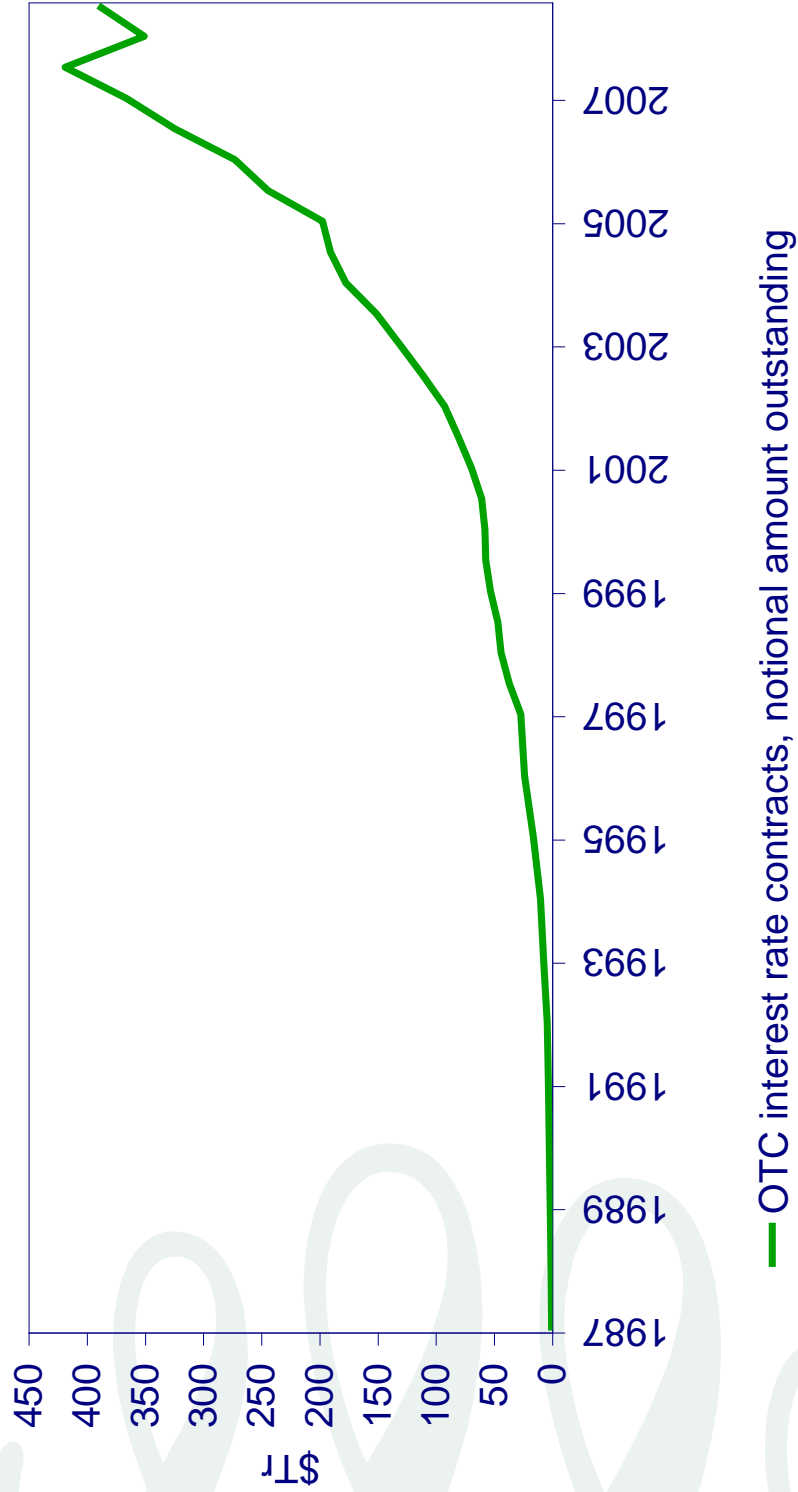


Source: NYMEX

Chart 27



Interest rate derivatives trading: 1980 – 2009



Source: ISDA Market Survey (1987-1997), BIS Quarterly Review (1998-2009). Includes interest rate swaps and interest rate options.

Chart 28



Credit prices and productive investment: the commonly assumed model

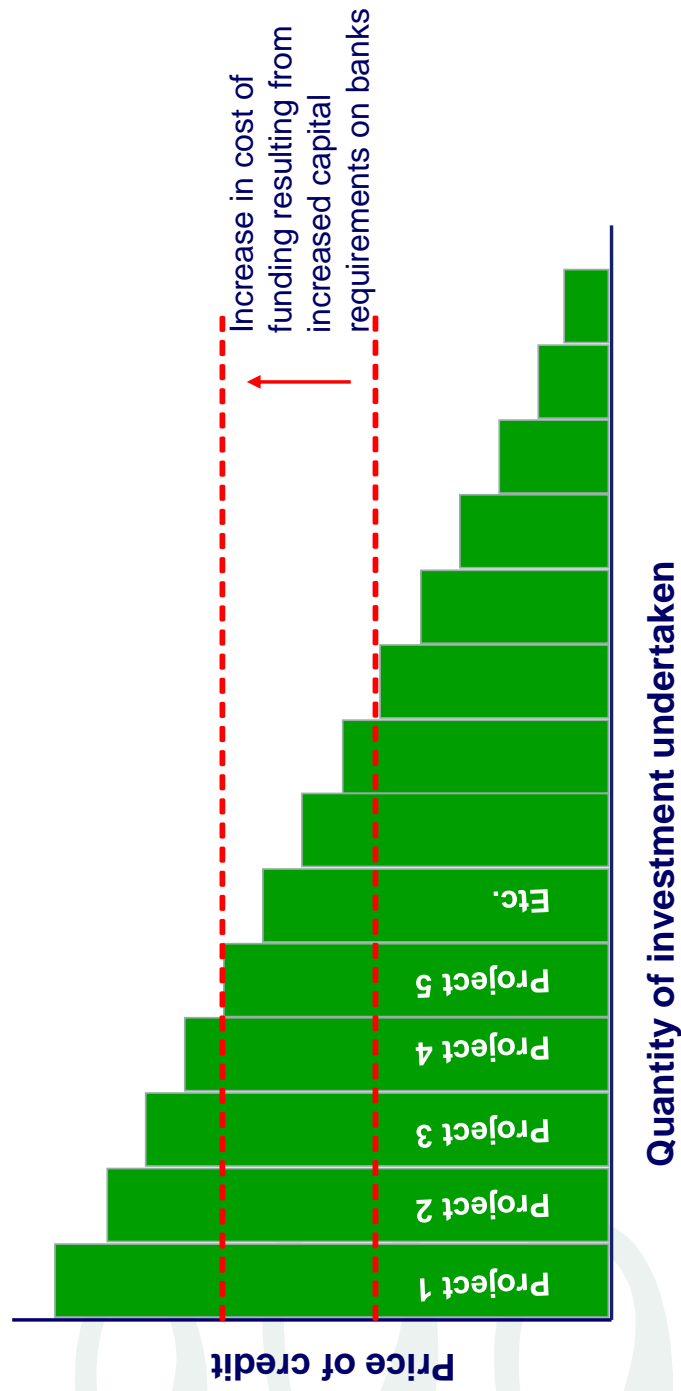


Chart 29



Residential dwellings investment as % of GDP

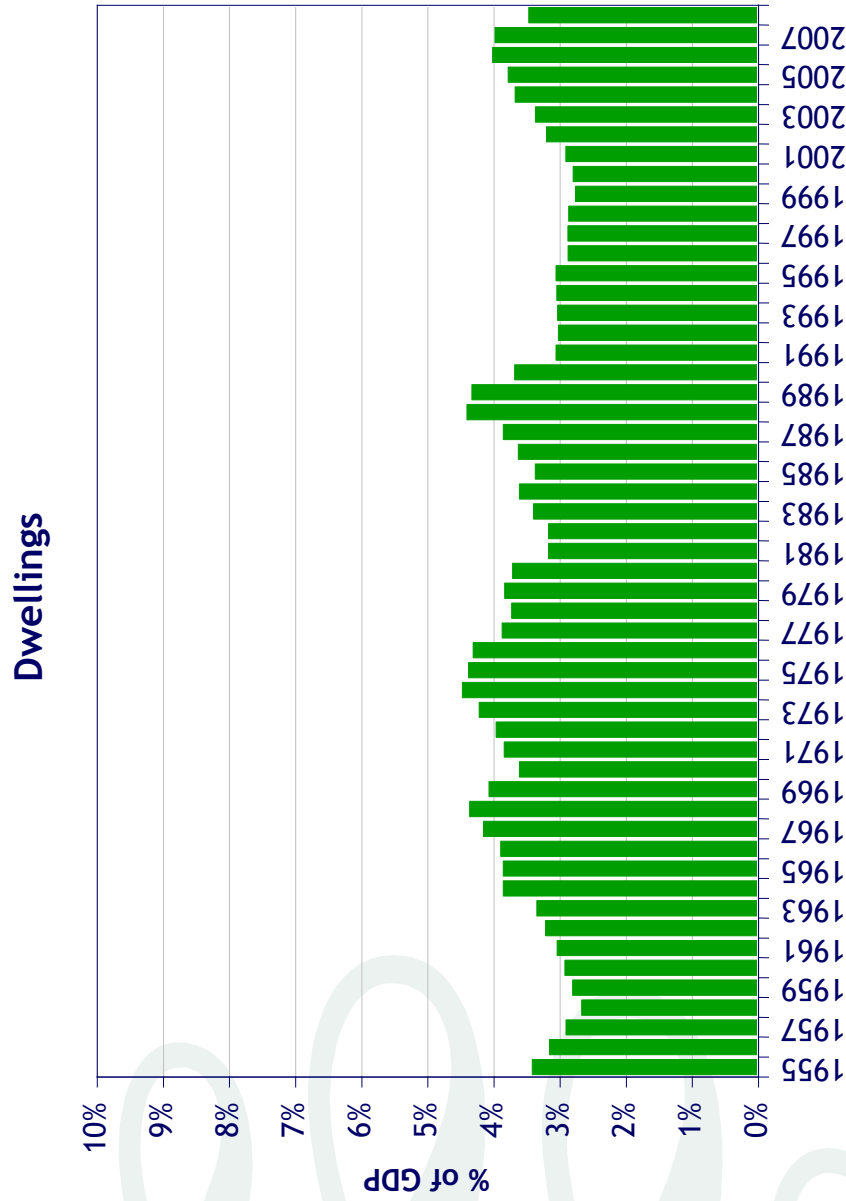


Chart 30



Housing capital stock, market value and debt

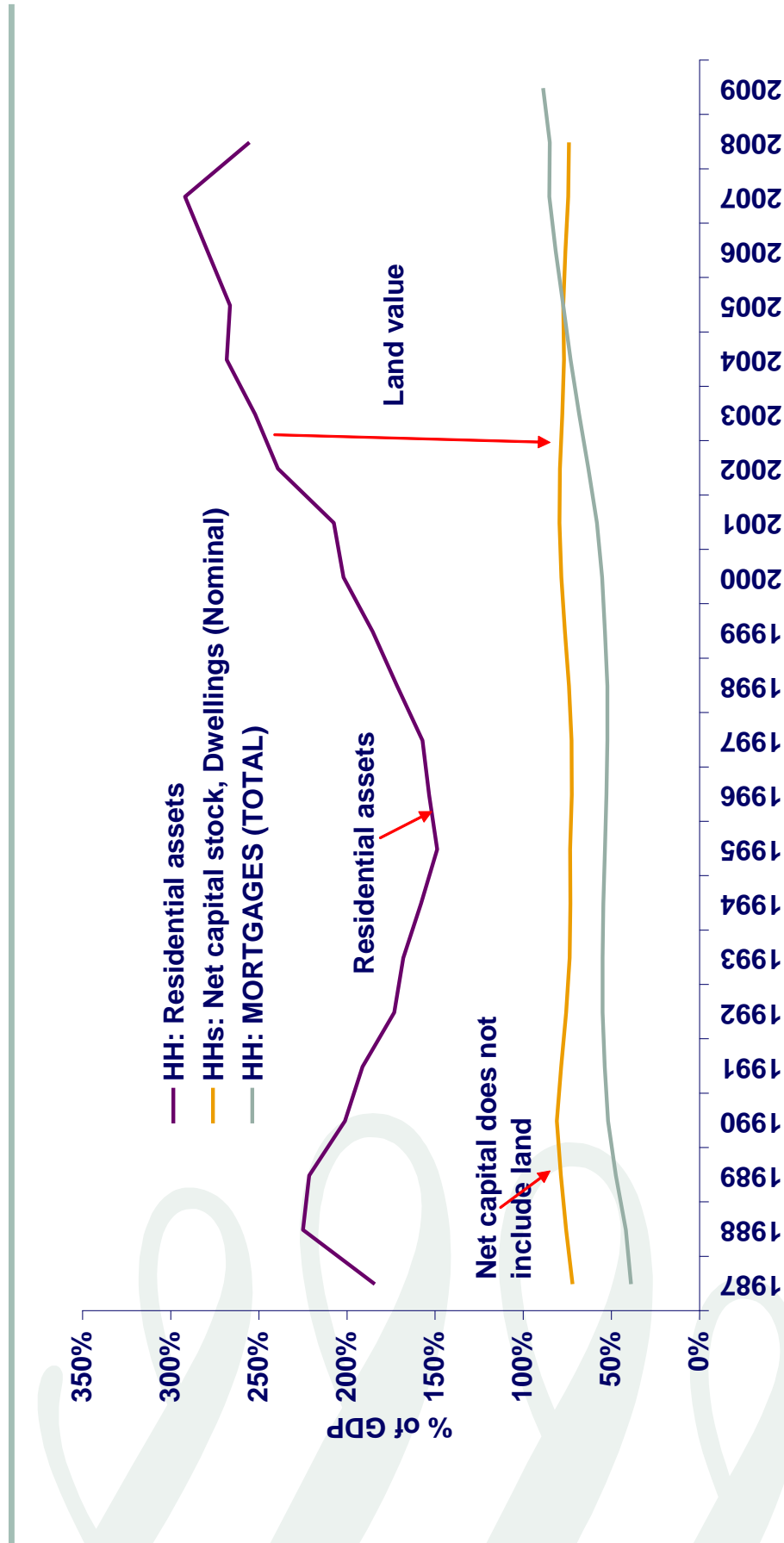


Chart 31



Gross capital investment in buildings and machinery structures: 1955 – 2007

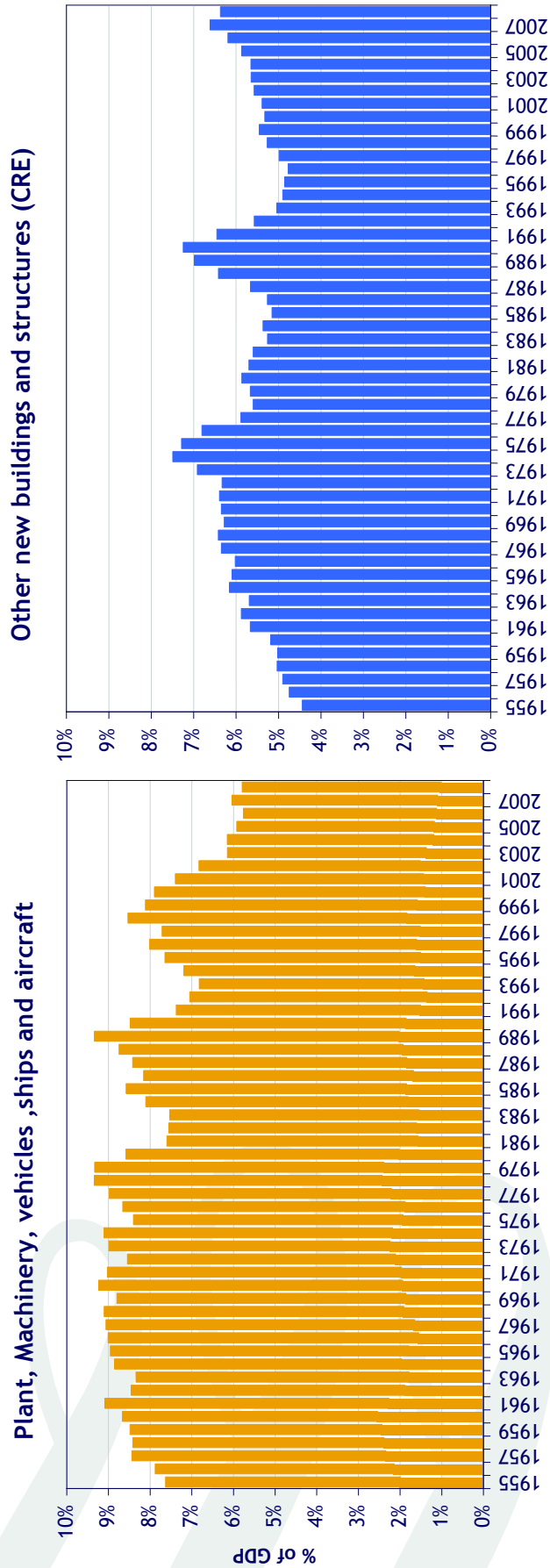


Chart 32



Credit and asset price cycles

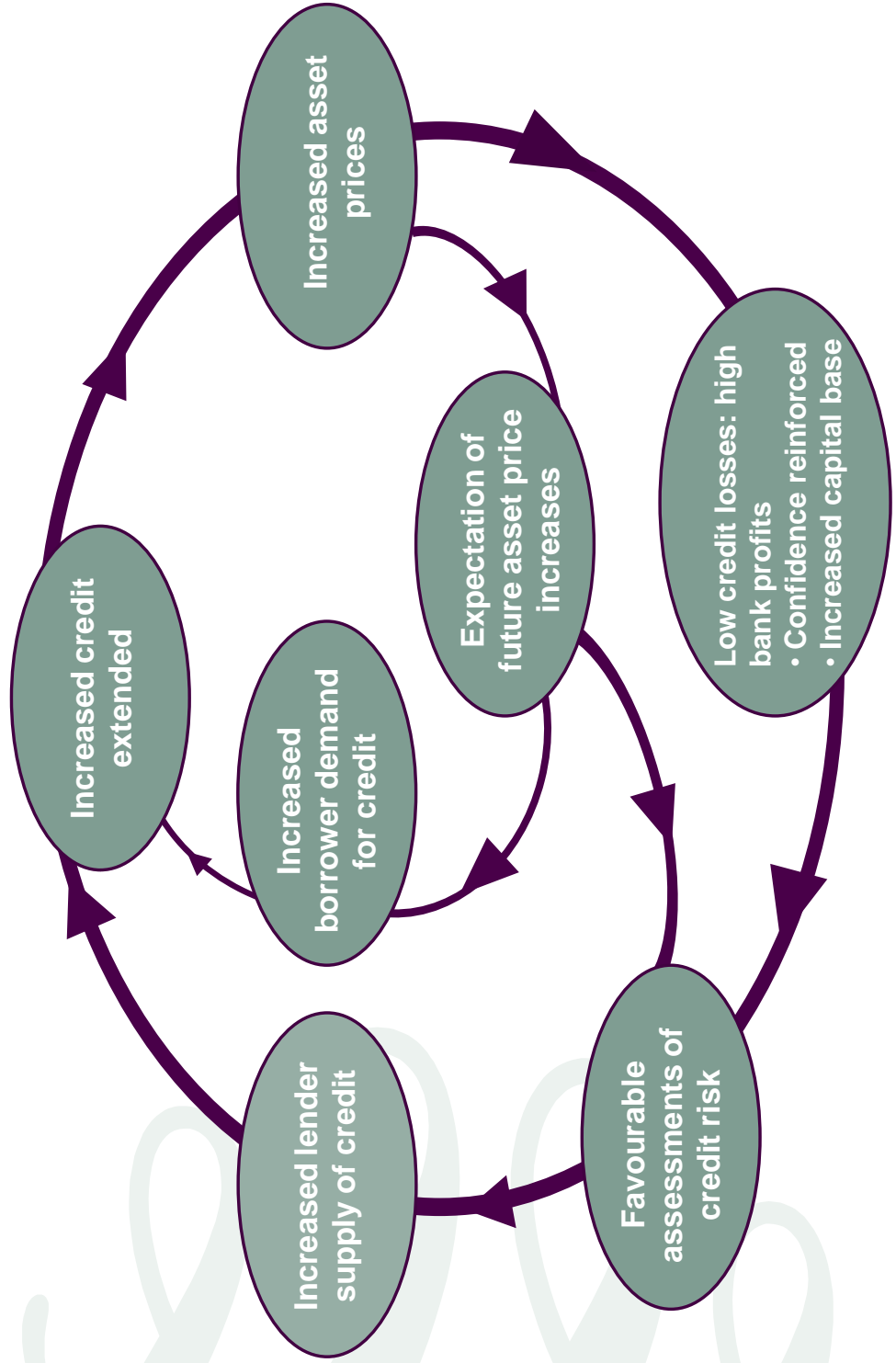


Chart 33



Drivers and economic function of different categories of debt

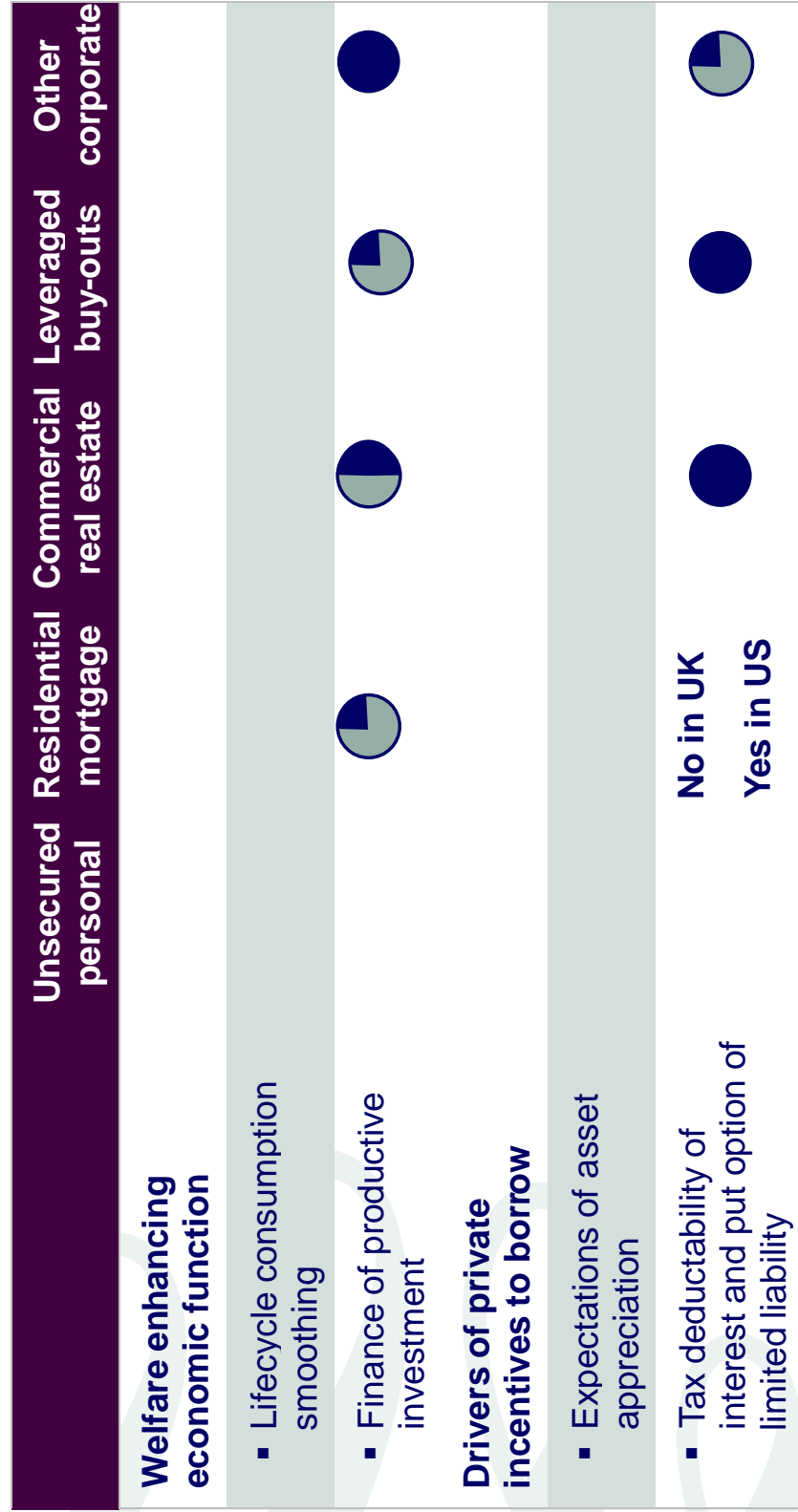


Chart 34



Bank and building society lending in £ to UK economy by function: 2009

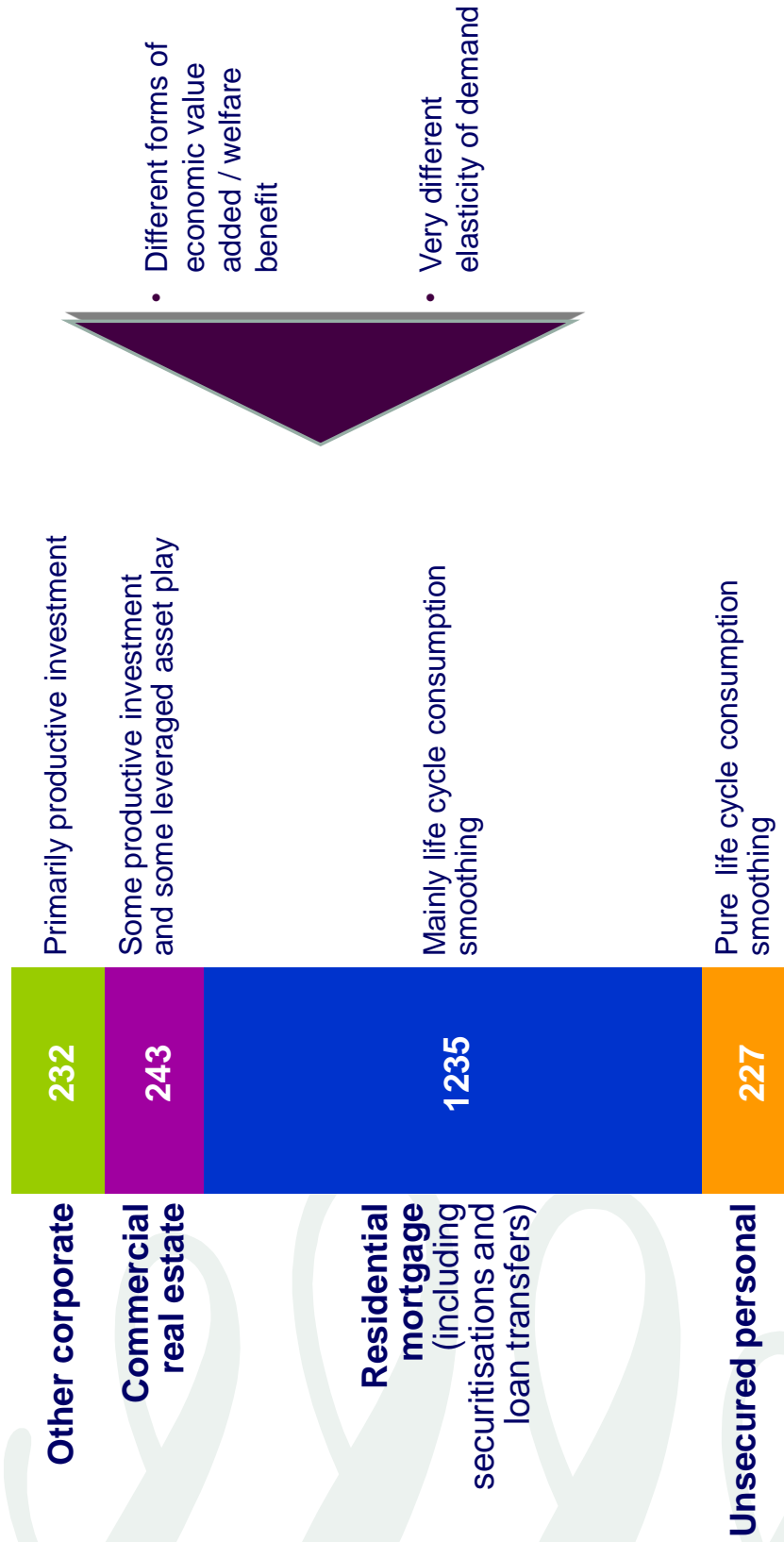


Chart 35



Investors in US and European prime RMBS: change in number of investors between 2006/07 and 2009

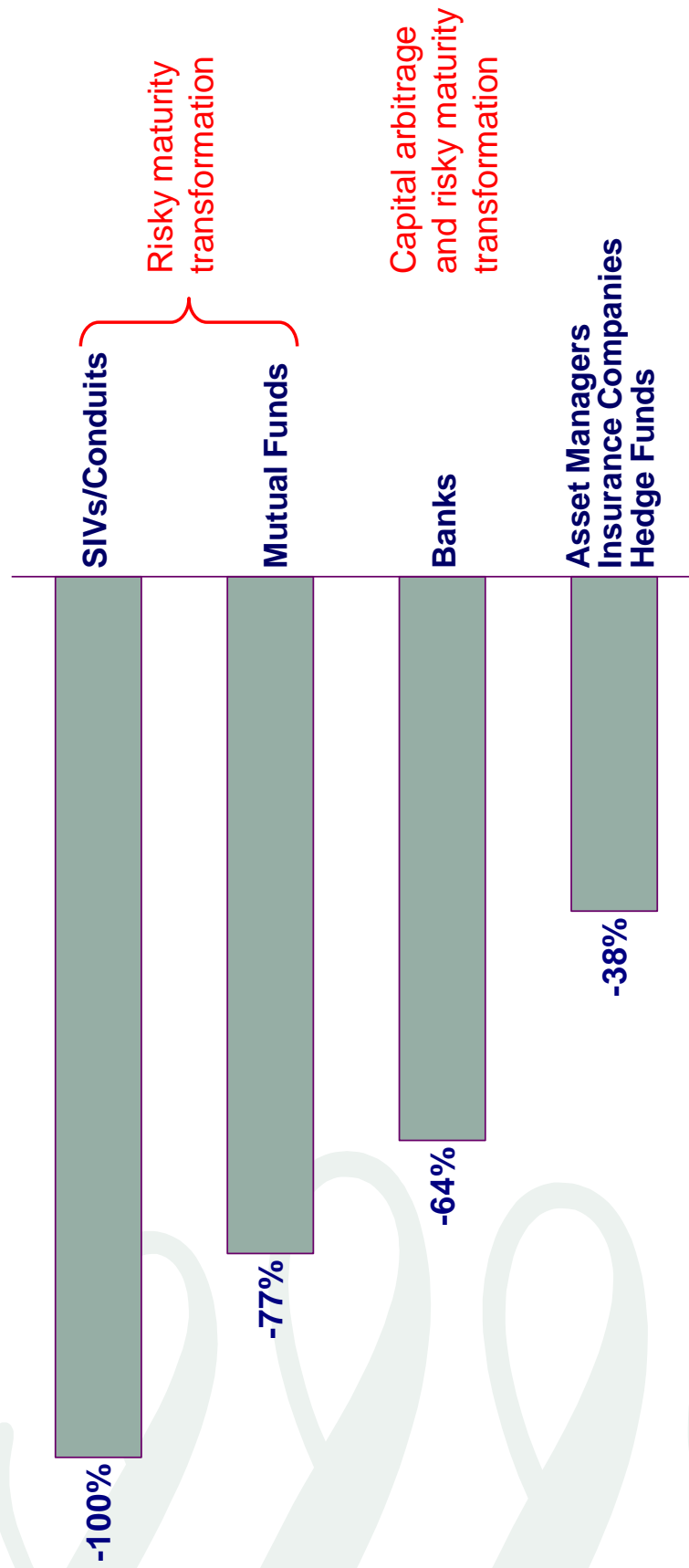
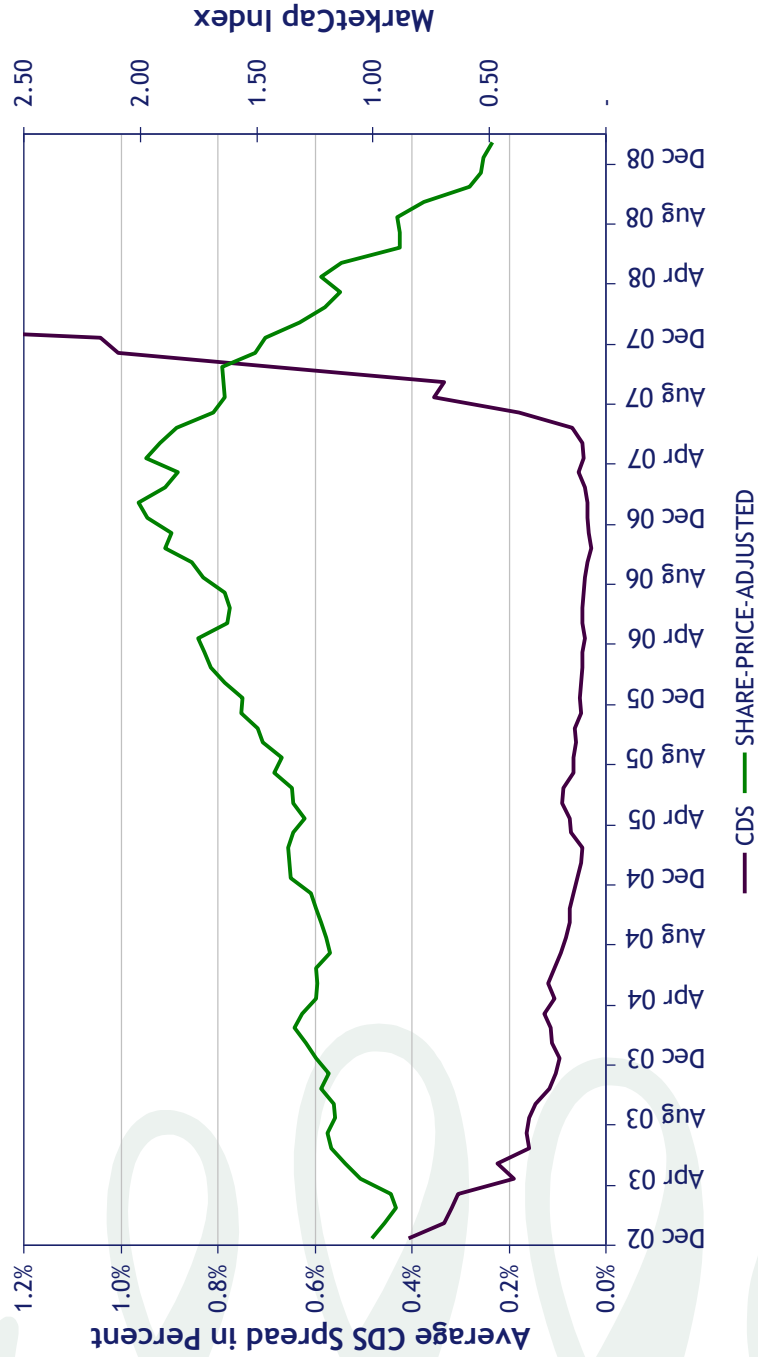


Chart 36



Financial firms' CDS and share prices



Firms included: Ambac, Aviva, Banco Santander, Barclays, Berkshire Hathaway, Bradford & Bingley, Citigroup, Deutsche Bank, Fortis, HBOS, Lehman Brothers, Merrill Lynch, Morgan Stanley, National Australia Bank, Royal Bank of Scotland and UBS.
 CDS series peaks at 6.54% in September 2008.

Source: Moody's KMV, FSA Calculations

Chart 37



Credit and asset prices: with securitised credit and mark-to-market accounting

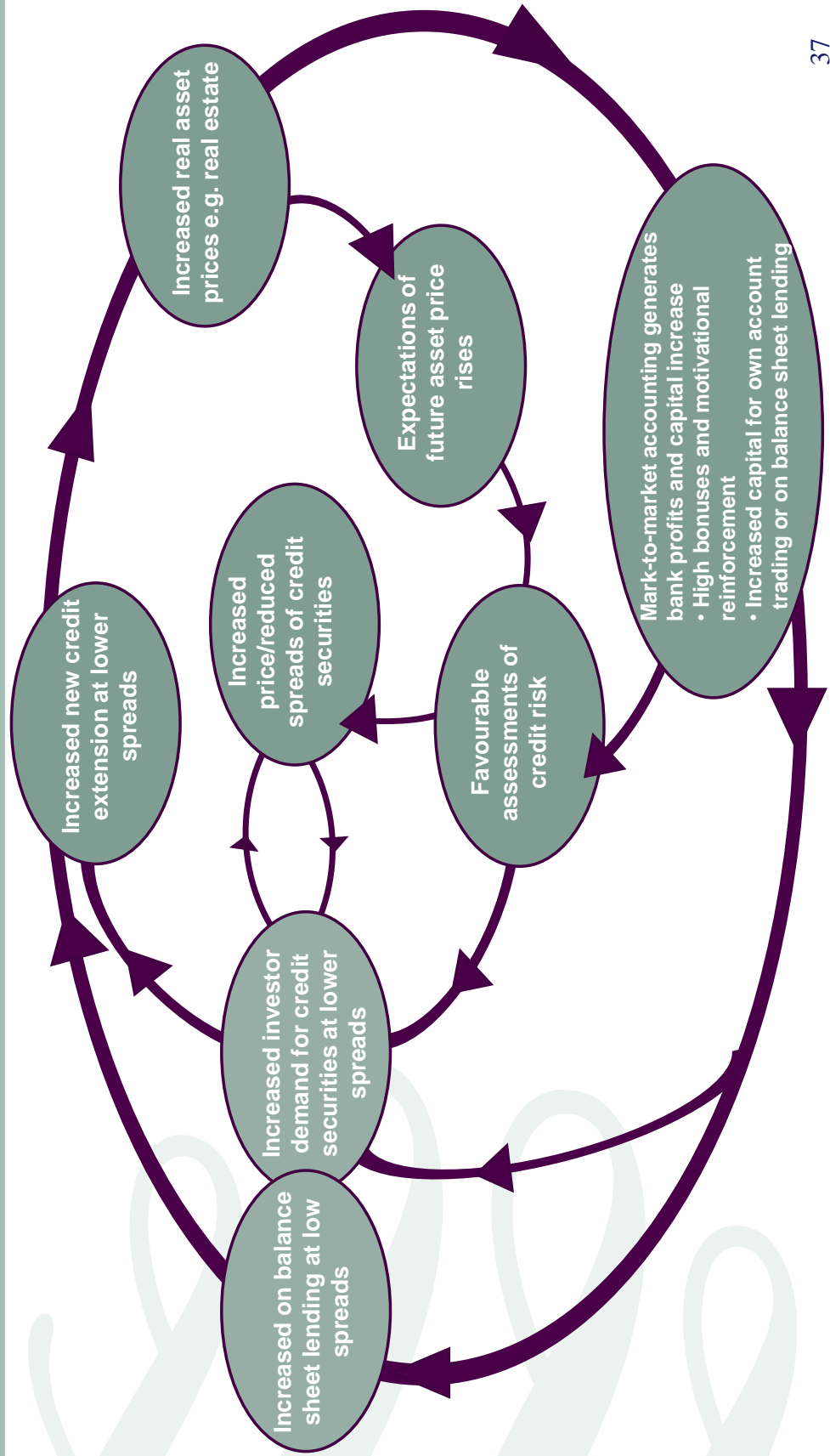
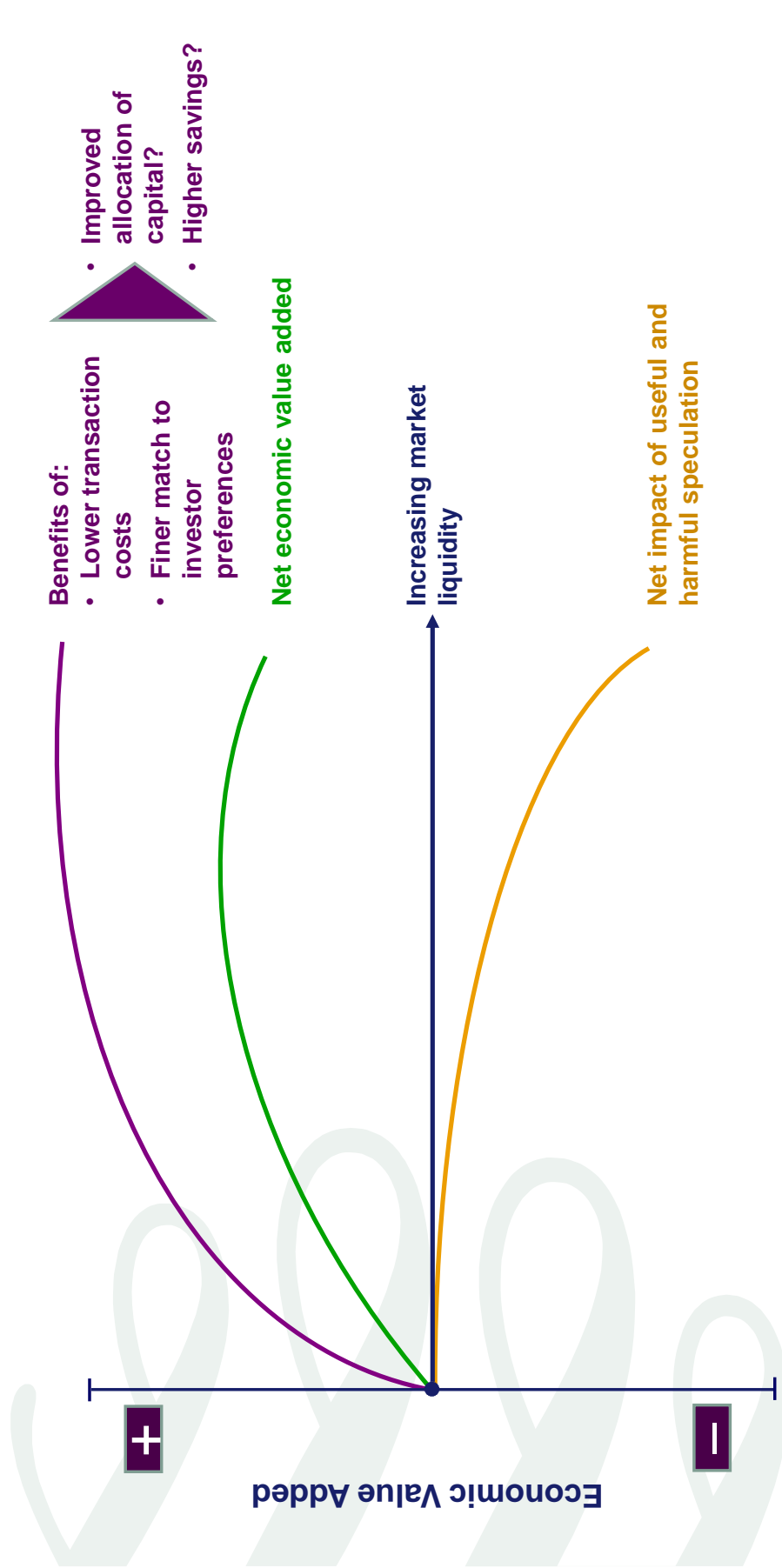


Chart 38



How valuable is increased market liquidity? Possible conceptual framework



Chapter 2

What is the contribution of the financial sector: Miracle or mirage?

Andrew Haldane, Simon Brennan and Vasileios Madouros¹

This chapter considers the contribution made by the financial sector to the wider economy. The measured GDP contribution of the financial sector suggests it underwent a "productivity miracle" from the 1980s onwards, as finance rose as share of national output despite a declining labour and capital share. But a detailed decomposition of returns to banking suggests an alternative interpretation: much of the growth reflected the effects of higher risk-taking. Leverage, higher trading profits and investments in deep-out-of-the-money options were the risk-taking strategies generating excess returns to bank shareholders and staff. Subsequently, as these risks have materialised, returns to banking have reversed. In this sense, high pre-crisis returns to finance may have been more mirage than miracle. This suggests better measuring of risk-taking in finance is an important public policy objective - for statisticians and regulators, as well as for banks and their investors.

1. Introduction

The financial crisis of the past three years has, on any measure, been extremely costly. As in past financial crises, public sector debt seems set to double relative to national income in a number of countries (Reinhart and Rogoff (2009)). And measures of foregone output, now and in the future, put the net present value cost of the crisis at anywhere between one and five times annual world GDP (Haldane (2010)). Either way, the scars from the current crisis seem likely to be felt for a generation.

It is against this backdrop that an intense debate is underway internationally about reform of finance (Goodhart (2010)). Many of the key planks of that debate are covered in other chapters in this volume. Some of these reform measures are extensions or elaborations of existing regulatory initiatives – for example, higher buffers of higher quality capital and liquidity. Others propose a reorientation of existing regulatory

¹ We would like to thank Stephen Burgess, Melissa Davey, Rob Elder, Perry Francis, Jen Han, Sam Knott, Nick Oulton, Peter Richardson, Jeremy Rowe, Chris Shadforth, Sally Srinivasan and Iain de Weymarn for comments and discussion on earlier drafts, and Alexander Haywood and Laura Wightman for research assistance. The views expressed are those of the authors and not necessarily those of the Bank of England.

