

WHAT DO BANKS DO, WHAT SHOULD THEY DO AND WHAT PUBLIC POLICIES ARE NEEDED TO ENSURE BEST RESULTS FOR THE REAL ECONOMY?

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Last August, some remarks of mine caused controversy. I suggested that some of the activities which went on in the trading rooms of some banks in the run up to the financial crisis were ‘socially useless’. People have asked me whether I regret those comments. The answer is no, except in one very small respect. Which is that I think it would have been better to use the phrase ‘economically useless’ or ‘of no economic value added’. For my purpose was to provoke a debate about the functions which banks and near banks play in the economy, and about whether and under what circumstances we can be confident that the impact of their activities will be beneficial for the real economy and thus for human welfare. It is on that issue that I will focus this evening.¹

In Cass’ publicity for this lecture, I have used the title ‘What Do Banks Do and What Should They Do?’ I will, however, place my comments about banks within the context of the overall financial system. I will also consider not only what the financial system does and should ideally do – but also what public policies are required to ensure that the system focuses on its potentially value added functions. I will propose three key conclusions.

- First, that we need a new set of macro-prudential policy tools which will enable the authorities more directly to influence the supply of credit and that these tools may need to be able to distinguish between different categories of credit – for instance real estate finance versus other. These tools are needed because credit/asset price cycles can be key drivers of macroeconomic volatility and potential financial instability: because different categories of credit perform different economic functions; and because the interest rate elasticity of demand for different categories can vary hugely.
- Second, that the financial innovations of complex securitisation and credit derivatives may, if purged of their excesses, have potential to improve bank risk management, but that the argument that they created great allocative efficiency benefits via market completion was hugely overstated. And that a major role for securitised credit can accentuate credit/asset price cycles, implying that macro-prudential tools need ideally to be able to constrain securitised credit markets as well as on-balance sheet credit.

¹ I will not address in this lecture the issue of the relationship between measured economic growth and human welfare. The fact that the positive relationship between human welfare and measured GDP per capita appears to become weaker and less certain the higher the level of income already attained, would however imply that the conclusions of this lecture would apply with still greater force.

- Third, that we need a new philosophical approach to ‘market liquidity’ which recognises that market liquidity is beneficial up to a point but not beyond that point, and which thus dethrones the idea that more liquidity, supported by more trading, is axiomatically beneficial. That dethroning then implies a bias to conservatism in our setting of capital requirements against trading activity: it reinforces the case for limiting via capital requirements the extent to which commercial banks are involved in proprietary trading; and it may argue in favour of financial transaction taxes.

To make these points, the lecture is structured in six sections (slide 1).

1. First, what a financial system does: and its 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. Finally, in the sixth section, I will comment on how radical we need to be in reforming the UK and global financial system. And I will suggest that we need to be careful of defining ‘radicalism’ too narrowly, and in particular that while moral hazard and ‘too big to fail’ problems are important, too exclusive a focus on them may actually lead to an insufficiently radical response to the crisis.

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 tonight, I will start with a fourfold distinction between (slide 1):

- 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 this evening 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 (slide 2) 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 (slide 3).

- 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 (slide 4). 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 (slide 5). 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.

These four transformation functions can deliver value added to the economy in three different ways (slide 6).

- 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

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.

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.

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 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 unpooled 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.

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.

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 different dimensions to this increase (slide 7):

- **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 **intrafinancial** 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 this evening: 'in the monetarist view of Friedman and Schwartz (1963) and also in the recently dominant neokeynesian synthesis, macroeconomic outcomes are largely independent of the performance of the financial system'.⁶

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.

- 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 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.

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

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

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. Slide 8 shows the balance sheet of the UK banking 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 (slide 9) 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 (slide 10). 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 slide 10.

Meanwhile (slide 11) 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 (slide 12) 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 (slide 14) 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 slide 13) 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 (slide 14).

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 this evening, 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 (slide 15) 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 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 (slide 16) 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 (slide 17) and gross deposits by different sectors into the banking system (slide 18), then we can calculate each sector's **net** deposits to or net lending from the banking sector (slide 19). 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 (slide 20):

- 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 (slide 21), 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 (slide 22). 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 (slide 23) 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 (slide 24), 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 (slide 25), in particular consumer credit and commercial mortgages.

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 (slide 26) – 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 (slide 27) complex

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

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 (slide 28) 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 (slide 10) 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. (slide 29) 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 (slide 30). 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 (slide 31).
- And interest rate derivatives trading has grown from nil in 1980 to \$390 trillion in mid-2009 (slide 32).

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 (slide 33).

- 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 this evening 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 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* (slide 34). 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.

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

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 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 preposition 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 this evening. 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 (slide 35).

- 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 this evening, however, I will focus solely on the long-term question.

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

And I will begin by assuming (slide 36) 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 (slide 37) 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 (slide 38) 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 this evening, 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 slides. Consider for instance, the growth of UK mortgage credit (slide 16), 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 (slide 39) 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 (slide 40). Instead what we 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

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.

¹⁵ The difference between the market value of housing and the net capital stock illustrated on Exhibit 41, is to a significant extent explained by land values. Mortgage credit in a rich densely populated but stable population

Which does not, I must immediately stress, mean that mortgage finance has no economic or social value (Exhibit 41) 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 at 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 as illustrated on slide 42.

- 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 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 (slide 16).

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.

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 (slide 54). 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 (slide 43).

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 (slide 44) 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 (slide 45) 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 (slide 46), 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 (slides 47).

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 (slide 48).

- 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 (slide 49). 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.

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

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.

Four related arguments were advanced in favour of credit securitisation (slide 50).

- 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 (slide 51).

- 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 resecuritisations, such as CPDO's and CDO squareds, combined with a general lack of transparency about underlying credit quality.

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.

- 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 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?

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

Let's consider the 'economic value added' case for securitisation under three headings (slide 52).

- 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}

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.

- 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 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 slide 51 described, 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 (slide 29). 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 (slide 53). 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

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.

²⁴ Note that this fact is highly pertinent to the “transitional dynamics” issue highlighted on Exhibit 36, which this lecture 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.

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 slide 45, followed by 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’ (slide 54). 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 here on (slide 55), 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 combined securitised and on balance sheet credit system could therefore be even more susceptible to self-reinforcing exuberant upswings and subsequent downswings than a pure bank system (slide 56).

- 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.

The implication of this is 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

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

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 (eg, 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 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 liberalisation and innovation, has therefore argued that increased liquidity is wholly beneficial in all markets for five reasons (slide 57).

- 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’.

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.

And sceptism about the limitless benefits of market liquidity supported by speculative trading is justified on at least three grounds (slide 58).

- First, the fact that the benefits of market liquidity must, like the benefits of any market completion, be 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-marking 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

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).

the larger pure financial activity becomes relative to underlying real economic activity (slide 59).

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*

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

*financial markets work too well: a cautious case for a securities transaction tax*³⁰, but in office subsequently he did not pursue it. 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 (slide 60).

- 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 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 more securitised system of credit extension might be even more vulnerable to credit/asset price cycles than a wholly bank balance sheet-based system, as credit assessment and pricing decisions become self-referential. I therefore concluded that new macro-prudential tools need to be concerned with securitised credit extension as well as with credit extension by banks. And I argued for a cautious approach to the supposed benefits of innovation.
- 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

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

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 .

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 (slide 61).

- 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 implications of my analysis this evening is that we need to consider other radical options not defined by this specific agenda.

- 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. But the really big economic costs of the most recent crisis are not the explicit costs of big bank rescue, but the economic volatility resulting from the credit/asset price cycle, and such volatility could be generated from the competitive interaction of multiple medium size banks as much as from the actions of Too-Big-To-Fail banks.
- The desire to limit the involvement of deposit taking commercial banks in risky proprietary trading activities is well founded. But it is most likely to be achieved by radical reform of the trading book capital regime rather than by legislative distinctions. And it would do nothing to address the economic volatility and financial instability which could be induced by excessive trading activity outside the commercial banking system, and which needs to be addressed by appropriate leverage constraints on all categories of traders, and perhaps under some circumstances by transaction taxes.
- And it is not clear that the narrow bank or limited purpose bank options put forward by John Kay and Larry Kotlikoff would address what appears to be the most fundamental challenge – the interaction of credit supply and real asset prices in self-reinforcing cycles

(slide 62). John Kay's proposition is that retail deposit-making banks which enjoy deposit insurance protection should be invested 100% in government gilts, and that all other financial activities should be deregulated and unsupervised, with lending banks funded by uninsured retail and commercial deposits and by wholesale funding in a free and open market. Such free and open markets might still, however, generate credit and asset price cycles of the sort we have just gone through. Larry Kotlikoff's proposal is that lending banks should be required effectively to be 100% equity financed, performing therefore a pooling but not a tranching function and with their investors sharing month-by-month in the economic performance of the underlying loans (or indeed day-by-day if valuations can be completed that fast). But if, as I argued in Section 4, a system of securitised credit and mark-to-market accounting can generate self-referential cycles of over and under confidence, then this model could deliver a credit/asset price cycle as extreme as currently generated by our banking system. Investments in Kotlikoff's loan funds might well surge when valuations are on an upswing, but then collapse when valuations and confidence fall, generating a credit crunch quite as severe as that of 2009.

There is therefore a danger that if radicalism is defined exclusively in terms of smaller banks and narrow banks, that we will fail to be truly radical in our analysis of the financial system, and fail 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 a centrally important phenomena, and that the widespread trading of credit securities can increase the extent to which credit and asset prices are linked in self-reinforcing cycles, then we have challenges which cannot be overcome by any silver bullet structural solution. Instead we need to deploy a wide range of regulatory and macro-prudential tools, informed by a philosophy deeply sceptical of past arguments that financial liberalisation, innovation, and deepening is axiomatically beneficial.