

**ESCAPING THE DEBT ADDICTION: MONETARY AND MACRO-PRUDENTIAL POLICY
IN THE POST CRISIS WORLD**

Adair Turner

CENTRE FOR FINANCIAL STUDIES
FRANKFURT
10th February 2014

“Demonstrating that an exchange economy is coherent and stable does not demonstrate that the same is true of an economy with capitalist financial institutions... Indeed central banking and other financial control devices arose as a response to the embarrassing incoherence of financial markets”

(Hyman P. Minsky, “Stabilising an Unstable Economy”)

Over several decades prior to the crisis, private sector credit grew faster than GDP in most advanced economies, and leverage therefore grew. That growth in private leverage was a major cause of the crash of 2007 to 8, and the predominant reason why the post crisis recession was so deep and the recovery so weak and slow.

But pre-crisis credit growth did not result in inflation above central bank targets. And it appeared necessary to achieve reasonable growth in nominal demand and real output growth in line with potential.

These facts together suggest a severe dilemma:

We seem to need credit growth faster than GDP growth to achieve an optimally growing economy, but that leads inevitably to crisis and post-crisis recession.

Can this be true?

- If it is true, then we have not attained and do not know how to attain an equilibrium growth path in a monetary economy, as against in the real exchange world of some economic theory.
- If it is true, we face an unavoidable and disagreeable choice between either financial and macro-economic instability or sub-optimally low growth. We seem to face the danger that the economy will be either unstable or suffer from what former US Treasury Secretary Larry Summers and others have labelled “secular stagnation”.

In this lecture I will argue that the dilemma is not inherent and unavoidable. There could, I argue, exist an optimal path which combined low but positive inflation and real growth in line with productive potential, together with credit growth no faster than nominal GDP growth and thus leverage stable. And there is I suggest no inherent demand side reason which condemns us to secular stagnation. But I also argue that to attain such a desirable path requires both:

- Reforms to financial regulations and central bank theory and practice which go far beyond those agreed in response to the crisis.
- Measures to address the fundamental drivers of excessive credit creation – in particular rising inequality and global asset current-account imbalances – which go far beyond the technical realm of central bank policy, and which as a result will be even more difficult to achieve.

My argument therefore suggests that already agreed reforms to financial regulation, though undoubtedly valuable, are inadequate to prevent a future repeat of a 2007-08 style crisis. But it also suggests that much pre-crisis economics and finance theory presented an inadequate account of the role of credit creation within an economy, and of the consequences of resulting leverage.

In that pre-crisis orthodoxy, credit is extended primarily to finance new business investment. But in fact most credit in advanced economies does not serve this function, but finances either household consumption or the purchase of already existing assets, and in particular the purchase of real estate and the irreproducible land on which it sits. And at the core of financial instability in advanced economies lies, I suggest, the interaction between the in principle infinitely elastic supply of new private credit and matching private money, and the highly inelastic supply of locationally specific land.

This, I argue, has major implications for understanding why the crisis occurred, why recovery has been so weak, and the policies now required. Public authorities need to treat both the quantity of new credit created and the mix of that credit between different purposes as key economic variables which need to be managed by strong public policy levers. That requires radically new approaches to bank capital requirements, the regulation of borrower behaviours as well as lender, and the integration of macro-prudential and monetary policy objectives and tools.

I present this argument in ten sections:

1. Money, credit and purchasing power: some basic concepts
2. Credit based growth, rising leverage and debt overhang: why too much financial deepening can be harmful
3. Central banks before the crisis - the failure of orthodoxy, and the policy dilemma.
4. Explanation one: different categories of credit: the central role of real estate
5. Explanation two: inequality, credit and yet more inequality
6. Explanation three: global imbalances
7. Summary conclusions on the drivers of credit intensive growth
8. Policy dilemmas amid post-crisis debt overhang: a brief comment

9. Policies to prevent future crisis: managing the quantity and mix of debt
10. Secular stagnation versus recurrent instability – an unavoidable choice? In principle no: but in practice yes absent radical reform.

One final introductory comment: I have written this paper in an assertive style, deliberately cutting out “I thinks”, “I suggests” or “probablys”. But that is simply to help the flow of the argument: my conclusions are tentative. Economic and finance theory has largely failed to achieve a convincing comprehensive account of the relationship between financial and macroeconomic instability. My aim is simply to set out some hypotheses which might explain some of the dynamics at work.

1. MONEY, CREDIT AND PURCHASING POWER

For several decades ahead of the crisis, private credit in most advanced economies grew far faster than nominal GDP. To think straight about why that occurred, and with what consequences, it is useful first to be clear about the positive role that private credit can play in ensuring that nominal demand grows at an optimal rate. I explored this issue in detail in a recent lecture at the Stockholm School of Economics [Turner 2013b]. The key points are:

Bank (and non-bank) credit creation is one of two possible means to avoid a harmful deficiency in aggregate nominal demand which could arise in a pure metallic money system. There are advantages to relying on credit creation to achieve this effect, but it is vital to understand the implications which follow from this choice.

In a pure metallic money system, without any private credit or paper money¹, the increase in the money supply would be limited by the flow of new precious metal available for minting. Two related effects might as a result constrain real growth.

- First, if the supply of new precious metal were limited, achieving real output growth in line with potential might require downward flexibility of wages and prices. But such downward flexibility might either be unattainable, or if attainable, might itself have depressive effects.
- Second, in such a system, an increase in savings can literally take the form of “hoarding”, with spending power in some absolute sense removed from the economy. This would increase yet further the downward price flexibility required before equilibrium is restored.

Clearly, if significant downward flexibility in wages and prices is compatible with full employment and real growth in line with potential, no problem arises. But modern economic theory and policy has tended to the assumption that at very least price stability, and ideally a low but positive rate of inflation, is optimal. To achieve this, some growth in aggregate nominal demand is required. If 2% inflation is desirable and 2% real growth attainable, aggregate nominal demand of around 4% per annum is optimal².

¹ In practice, absolutely pure metallic money systems, with no private credit, have never or hardly ever existed. Almost all metallic money systems have involved ‘simple credit’ (e.g. credit extended between trades); most have involved some bank credit creation.

² Note that at several points in the lecture I treat nominal GDP growth of around 4%-5% as desirable for advanced economies. This is not to imply that central banks should follow formal money GDP targets. But if a central bank follows a 2% inflation target, if its pursuit of that target is guided by analysis of an ‘output gap’ versus potential output; and if

One way to deliver growth in nominal purchasing power beyond that which would occur given the constraints imposed by precious metal supply, involves the government/central bank using absolute fiat money (not backed by precious metal) to cover fiscal deficits not funded by the issue of interest-bearing debt. And there are instances in economic history when money financed deficits have been compatible with reasonable price stability while supporting economic growth³. Milton Friedman, indeed, proposed in 1948, that such money financed deficits should be the normal practice [M. Friedman, 1948]. But government fiat money creation carries two dangers:

- It politicises decisions as to the allocation of additional purchasing power.
- And it may be difficult, once the option of fiat money finance is admitted, to prevent its excessive use. That point is obvious here in Germany, with the historic example of the Weimar hyperinflation.

The alternative route to adequate nominal demand growth is through the creation of private credit. The way in which private credit, creates spending power, and the potential problems which might arise, were brilliantly analysed a century ago by the Swedish economist Knut Wicksell in his seminal work “Interest and Prices” [Wicksell 1905]. As he pointed out, purchasing power and thus increased nominal demand, can be created even by what he called “simple credit”, arising from the willingness of one business to sell to another on credit, receiving in return only a promissory note. But this potential is greatly enhanced if we have banks.

That is because banks create credit and matching money (Exhibit 1)⁴. As Wicksell described, they lend money to an entrepreneur/business, and credit the business’s money account at the bank. If the tenor of the loan is longer than the tenor of the deposit, that creates increased purchasing power and increased nominal demand within the economy.

Bank credit and money creation can thus be seen as an alternative means to ensure adequate nominal demand growth, without the potential dangers created by government fiat money creation.

But in fact private credit creation in itself carries two dangers:

- First, private credit creation might itself be excessive, or allocated in a suboptimal fashion.
- Second, bank (or other) private credit creation, unlike government fiat money creation, involves not just the creation of new money and purchasing power, but also the creation of ongoing debt contracts, which themselves have macroeconomic consequences.

This lecture explores those two dangers.

demography and technology are producing a 2%-3% long-term sustainable increase in potential output, then over time a growth of NCDP of around 4%-5% will result.

³ See Turner 2013(c) for reference to these examples.

⁴ In a modern financial system, ‘shadow banking’ can perform an equivalent function, creating both additional credit and new money equivalents. Throughout the rest of this lecture, therefore, whenever I refer to ‘banks’ or the ‘banking system’, I intend to cover both banks and shadow banks; and whenever I refer to ‘money’, I intend to cover also near money equivalents.

2. CREDIT BASED GROWTH AND HARMFUL LEVERAGE: THE DANGERS OF FINANCIAL DEEPENING

For many years and indeed decades ahead of the financial crisis, and on average across all advanced economies, private credit grew faster than GDP, and as a result private leverage (private credit divided to GDP) increased.

Exhibit 2 is taken from the ECB's latest Monthly Bulletin. It shows the relationship between the growth in real credit extension in the UK and the US over the last thirty years and the rate of real economic growth. There are important cyclical effects; and sometimes during recessions, credit growth may run behind economic growth. But on average over time private credit growth has exceeded GDP growth, and private leverage therefore has increased.⁵

- In the UK, for example, household debt grew from 15% of GDP in 1964 to 95% by 2008. (Exhibit 3)
- In the US, total private credit as percent of GDP grew relentlessly from around 50% of GDP in 1945 to over 200% by 2008. (Exhibit 4)
- In Spain, private credit grew from around 100% of GDP in 1980, to around 200% on the eve of the crisis.
- Indeed if we take all of the advanced economies together, we find that from the early 1950s to the mid-1990s, private domestic credit to GDP grew from around 50% to around 100%, and then rose even faster to reach about 170% on the eve of the 2007-08 crisis. (Exhibit 5) [Reinhart and Rogoff 2013]

Exhibit 5 also shows an increase in private debt to GDP in emerging economies up until the mid-1980s, but a plateau thereafter. But in fact, the last few years have seen a take-off of private credit creation in many emerging economies, and if Exhibit 5 were extended to 2013, increasing aggregate leverage in emerging economies would almost certainly be observed. In China "Total Social Finance" has grown from around 130% of GDP in 2008 to 200% today, and is increasing at about 20% per annum. (Exhibit 6) In Brazil, Hungary and Korea, and other emerging economies, growth in leverage is also observed. (Exhibit 7)

Across the world, therefore, economic growth is credit dependent, with credit growing faster than GDP. Indeed some market analysts have suggested that a second derivative effect can also be observed: that the extent to which credit growth has to exceed current GDP growth – "the credit intensity of growth" - is itself increasing over time. Exhibit 8 shows a comparison from an article by Citibank Economics which suggests such a relationship.

So modern economic growth is accompanied by, and seems to be dependent on, still faster credit growth and increasing leverage.

But I know what some of you in this audience, here in Frankfurt, are thinking. You're thinking - "not in all countries, not here in Germany: our growth has not been dependent on rapid credit growth and increasing leverage".

⁵ The estimates for leverage presented in this paper are drawn from a variety of sources, both international and national. It is noteworthy that estimates vary, e.g. BIS and OECD figures differ significantly. This reflects factors such as variable coverage of non-bank lending; and varying treatment of lending into a country by foreign banks, or out of country by domestic banks. The trends are however highly consistent between the different data sources.

But that is a delusion. Germany's growth is credit dependent. It's just that if you run a current-account surplus, the credit growth can all be in other countries.

- Yes, it is true that private credit extended in Germany has not increased relative to GDP (Exhibit 9).
- But before the 2008 crisis, Germany's export growth was dependent on rising credit in the UK, in Spain, and in the US.
- And today, Germany's exports of capital goods to China are dependent on the Chinese growth rate, which is being supported by explosive Chinese credit expansion.

At the global level indeed, private credit has been growing faster than global GDP: we have a model of growth which is, or appears to be, credit dependent. And that is true for Germany, and creates risks for Germany, as well as the rest of the world.

The pre-crisis orthodoxy: growing leverage irrelevant or positively beneficial

But does this growth in leverage matter? In the pre-crisis years, economics and finance tended to assume that it was either unimportant or positively beneficial.

The belief that it was unimportant dominated macro-economic theory and central bank practice. Modern macro theory treated the workings of the financial system as a "veil" through which real contractual relationships past unaffected⁶. In modern macro models and many textbooks, the details of the banking system are almost entirely absent. And central bank practice gravitated to the belief that achieving low and stable inflation in the price of current goods and services, was a sufficient objective to ensure macroeconomic stability. Money and credit aggregates might matter if but only if they had consequences for inflation. Leverage per se was of no specific importance. Section 3 explores the implications and limitations of this philosophy in more detail. But the summary is simple: rapid credit growth and rising leverage were not treated as indicators of future problems, nor as something which central banks should or could influence.

Meanwhile the belief that rising leverage could be positively beneficial dominated finance theory. "Non-state-contingent" debt contracts, it was illustrated, overcome the problems of "costly state verification", which might otherwise impede the willingness of savers to fund investment projects in a world where all contracts had to take an equity form [Townsend 1979] Economic historians illustrated how the development of banking systems had facilitated capital formation in the early stages of industrialisation [Gershenkron 1962]. A comprehensive literature review by Ross Levine in 2005 found apparently compelling empirical evidence that Private Credit to GDP, and Bank Credit to GDP, were positively correlated with economic growth, and in a causative rather than purely coincidental fashion [Levine 2005].

The dominant pre-crisis orthodoxy, reflected in for instance Raghuram Rajan and Luigi Zingales's 2003 book "Saving capitalism from the capitalists" was that "financial deepening"

⁶ Olivier Blanchard noted in October 2012 that much of modern macro-economics "assumed that we could ignore much of the details of the financial system". Mervyn King noted that the dominant Keynesian model of monetary economics "lacks on account of financial intermediation, so money, credit and banking play no meaningful role". [King 2012]

was beneficial both in general and specifically when it took the form of an increased use of debt contracts. [Rajan and Zingales 2003].

Challenging the pre-crisis consensus: private leverage matters

The benign pre-crisis assessment of increasing leverage has been severely challenged by the financial crisis of 2007-08 and the depth of the post-crisis recession. And several economists have made convincing arguments that high private leverage can cause harm.

Work by Alan Taylor, Moritz Schularick, and Oscar Jorda has found no evidence that the long sustained increase in leverage has made economies more efficient, and highlights the central role of leverage cycles in macro-economic instability [Jordá, Schularick and Taylor 2011; Taylor 2010; Taylor and Schularick 2009;] Carmen Reinhart and Kenneth Rogoff have illustrated the extreme difficulties which countries face if total domestic credit (both private and public combined) rises to very high levels. [Reinhart and Rogoff 2013]. Work by Steve Cecchetti and Enisse Kharoubi suggests that while rising private leverage can be positive for economic growth up to some level, beyond that it has a negative effect: they report the tentative finding of an “inverse U” relationship [Cecchetti and Kharroubi 2012]. (Exhibit 10)

These analyses are consistent with the belief that debt can be dangerous because:

- Free financial systems can suffer from a self-reinforcing tendency to create private debt contracts which are not sustainable in the light of reasonable assessments of borrower cash flow.
- High levels of private leverage make economies vulnerable to self-reinforcing debt deflation cycles.

Debt contracts fool us: excessive credit creation results

Free financial systems, unless constrained, have an inherent tendency to create too much of the wrong sort of debt:

- As Townsend and others have observed, debt contracts play a crucial role in overcoming the asymmetry of information between agents which would otherwise stymie capital formation in an all equity world. The very fact that they are “non-state-contingent”, however, can also fool investors into ignoring risks. In the upswing of the cycle, as Andrei Shleifer et al have observed, “local thinking” can lead investors to ignore the currently unobserved part of the distribution of possible returns which involves default risks. [Gennaioli, Shleifer and Vishny 2010] As a result, many credit securities can be created, which as Shleifer et al put it “owe their very existence to neglected risk”. The possibility of debt contracts can facilitate capital formation: but it can also exacerbate the danger of over investment and capital misallocation.
- This danger of excessive credit creation would exist even if all credit was extended, as almost all finance theory assumes, to finance new capital investment. But as Section 4 will explore, most credit in advanced economies does not finance new capital investment, but instead supports either increased consumption, or the purchase of already existing assets, in particular locationally specific real estate, whose value is endogenously influenced by the amount of credit extended. As a result, self-reinforcing borrower and lender beliefs and incentives can result in credit and asset price cycles which result in the accumulation of significant debt

levels and resulting leverage, but without the creation of additional capital stock which generates the cash flows required to repay those debts. (Exhibit 11)

- Thus as Hyman Minsky described, some debt finance, and an increasing proportion the longer the upswing of the cycle continues, is not justified by prospective household income or corporate operational cash flows. Instead it is, in Minsky's words, either "Speculative" (with capital only repayable if asset price rises continue), or in the final stages of the cycle "Ponzi" (with even interest payments only serviceable if further capital gains are achieved). [Minsky 1986]

Thus while debt contracts play a useful and indeed vital role, a free financial system is likely to create them in excessive quantities.

Post-crisis debt overhang and deflation

The adverse consequences of excessive debt manifest themselves once crisis has occurred, risk aversion has increased, and expectations of rising asset prices have been punctured. In the post crisis environment, the higher the level of private leverage, the greater the danger of a self-reinforcing debt deflation cycle of the sort described by Irving Fisher [Fisher 1933]. The cycle reflects the combined impact of:

- Bankruptcy and default costs. Equity contracts adjust smoothly to changing circumstances: "non-state-contingent" contracts adjust in a jumpy and costly fashion. As Ben Bernanke has observed "in a complete markets world, bankruptcy would never be observed". In the real world, defaults cause economic disruption. [Bernanke 2004]
- Rollover needs. Equity contracts represent a permanent commitment of capital to a company. As a result we could imagine a market economy operating for several years with no new equity issue markets. It would not be optimal, but it would not be catastrophic. By contrast, debt contracts with fixed maturities need to be continually rolled over. The continuous new supply of credit is therefore vitally important, but vulnerable to interruption if, for instance, the cycle of confidence illustrated on Exhibit 11 is shocked into reverse.
- Debt overhang effects. Finally, high levels of debt, particularly if secured against assets whose value is endogenously driven by the value of debt extended, can produce severe post-crisis debt overhang effects. If asset values fall, and households or corporates suffer leveraged net worth losses, the asymmetric response of net debtors and net creditors can induce a powerful deflationary impetus. As Gauti Eggertsson and Paul Krugman have modelled, net debtors cut consumption or investment in an attempt to delever, but net creditors feel no offsetting need to increase expenditure [Eggertsson and Krugman 2012]. Indeed if net creditors are suddenly aware of previously ignored risks to the value of their claims, they may also make cut expenditure.

All three of these post-crisis effects are important, but the third is likely the most significant. Richard Koo has presented a compelling case that Japan's fall into low growth and price deflation in the 1990s is best explained by the attempted deleveraging of Japanese corporates left overexposed by the credit and property price boom of the 1980s and the bust of 1990 [Koo 2009]. And a forthcoming book by Atif Mian and Amir Sufi, presents a strong argument that the depth of the US's post 2008 recession is best explained by the

demand impact of households cutting consumption in the face of leveraged falls in their net worth. [Mian and Sufi 2014]

In the Eurozone, meanwhile, it has become increasingly apparent over the last year that while repairing the financial system is a necessary step towards resumed private credit and economic growth, it is not sufficient. Market assessments of bank credit risk (as measured by CDS spreads) have fallen very significantly since 2012; and bank funding costs have fallen, particularly in the periphery countries. The barriers to credit supply have been very significantly mitigated. But, as the ECB's analysis recognises, credit growth in several countries is depressed by a lack of demand for credit from over-leveraged households and businesses. [ECB, 2013]

Mian and Sufi indeed argue that what they label the "Bank View" of the causes of weak post crisis recovery, which assigns pride of place to the impairment of the financial system and to resulting constraints on credit supply, should be rejected in favour of their alternative "Debt View", in which a fall in household consumption and demand for credit plays the crucial role. My own assessment is that both factors were important. But under both views, the level as well as the pace of growth of private leverage matters.

- In the Bank View it matters because the higher the leverage, the more vulnerable is the economy to any interruption in new credit supply.
- In the Debt View, it matters because higher leverage makes debt overhang effects more severe.

In both the higher the debt burden relative to income, the more vulnerable is the economy to deep post-crisis recession.

Financial deepening can be harmful

Many factors precipitated the 2007 to 8 crisis. Excessive leverage within the financial system played a major role: so too did increasing complexity, poor risk management systems and excessive maturity transformation. Increasing real economy leverage was therefore just one contributory factor in the causes of the crisis. But it is the prime reason for the slow and weak recovery.

But how does that square with the apparent empirical support for the pre-crisis proposition that increasing leverage was good for growth? The answer is revealed by the examples which Ross Levine gives in his survey of the literature.

- Empirical analysis he finds, shows that India would have benefited if its private credit to GDP ratio in the early 1990s had been higher than the actual level of 19.5%. Financial deepening, in the specific sense of rising private leverage, can be good for growth up to some level.
- But that is completely compatible with the proposition, put forward by Cecchetti and Kharroubi that beyond some threshold, rising private leverage has harmful effects.⁷

⁷ As discussed in Section 9(i), while there are strong reasons for believing that beyond some point rising leverage is bound to cause harm, it is not possible (now or perhaps ever) to define a precise X% limit. The range beyond which adverse effects will grow will be a function of (i) the mix of types of credit; (ii) public debt as well as private debt levels; (iii) long-term growth prospects reflecting technological and demographic trends.

Indeed, even if we were not wholly convinced that we had already reached such a threshold by 2008, it is difficult to imagine that there is not some level of private leverage beyond which harmful effects are likely to result.

Minsky's challenge is therefore an important one: can economies with capitalist financial institutions achieve long-term economic growth without rising leverage and periodic severe instability? And what policies are required to achieve that stable path?

3. CENTRAL BANKS BEFORE THE CRISIS: THE FAILURE OF ORTHODOXY AND THE POLICY DILEMMA

Ahead of the crisis central bank theory and practice gravitated to the belief that the sole objective of monetary policy should be to achieve low and stable rate of inflation, and that the primary (and almost the sole) tool to achieve this objective should be movements in the short-term interest rate. Changes in financial balance sheet aggregates were therefore treated as unimportant as long as inflation was in line with target. Some central bankers indeed probably hope that once the extraordinary conditions of the post-crisis period are behind us, we will be able and should return to that framework. In section 9 I argue that such a return is neither possible nor desirable.

But once again I know that here in Frankfurt, someone may object to the suggestion that all central banks ignored monetary balance sheets. And it is certainly true that the Bundesbank continued to assert that balance sheet aggregates matter; and that insistence was carried over into what was initially the "first pillar" of the ECB monetary framework, with inflation targeting as only the second pillar⁸.

But while applauding the Bundesbank for that insistence, I also want to argue that the focus was on the wrong side of the balance sheet and the wrong danger. For what the financial crisis has taught us is that

- The fact that private money is growing more rapidly than an appropriate rate of nominal GDP growth is not a strong indicator, or even a weak indicator, of future inflationary risks.⁹
- But private credit growth faster than nominal GDP growth, and resulting increases in leverage, can be forward indicators of future financial instability and possible post-crisis deflation.

The Great Moderation focus on inflation alone led us astray. But it seemed to follow naturally from the insight, explored initially by Knut Wicksell in *Interest and Prices*, and set out in section 1 above, that credit and in particular bank credit creates potential purchasing power. Indeed pre-crisis central bank theory was in some sense a direct descendant of Wicksell's hypothesis on optimal credit creation.

Wicksell argued that if central banks maintained the money rate of interest in line with the "natural rate of interest" (a concept somewhat close to the marginal productivity of capital) an appropriate level of credit creation and stable inflation would result. But since Wicksell's

⁸ See ECB Monthly Bulletin January 1999, pp 39-50. This defined the 'first pillar' as "*a prominent role for money, as signalled by the assessment of a reference value for the growth of a broad monetary aggregate*"; while the 'second pillar' was "*broadly based assessment of the outlook for future price developments*".

⁹ The reasons for this are set out in the Appendix, which argues that the concept of the 'demand for money' has been, in Benjamin Friedman's words, "a diversion which has not served our profession well".

“natural rate” is unobservable, the appropriate operational rule seems to be to pursue low and stable inflation, confident that if that objective is achieved it must result in an evolution of credit and money aggregates which is optimal.

If excess credit is dangerous because and only because it might produce excessive nominal demand over the short to medium term, achieving an inflation target is an appropriate guard against any dangers in credit markets.

But actual experience belies this theory:

- Central banks were remarkably successful in achieving low and stable inflation during the Great Moderation, but it ended in financial crisis.
- Monetary balance sheets (with credit on the asset side and money or money equivalents on the liability side) increased far faster than rates of nominal growth compatible with inflation targets, but no inflation has resulted.
- Instead we have faced severe post-crisis recession and deflationary dangers.

The implication is that central banks need to focus on the implications of private credit and money creation even if they know it will not result, whether in the short, medium or long-term, in inflationary pressures.¹⁰

And that seems to leave central banks facing a policy dilemma, which can usefully be expressed in the simple equations and illustrative magnitudes shown on Exhibit 12.

- Assume that optimal nominal GDP growth in advanced economies is roughly around 4-5%, made up of 2% inflation plus the medium term potential real growth rate. During the Great Moderation, such a rate of growth was broadly achieved in the Eurozone, the UK and the US. But the credit growth which resulted from central bank policy was considerably faster than that 4-5%: leverage relentlessly increased.
- Suppose then central banks had been worried by the potential financial stability effects of this rising leverage. They would presumably have increased interest rates to slow down credit growth.
- But that presumably would, at least to some extent, have reduced nominal GDP growth, resulting in some mix of inflation below target and/or real growth below potential.

We therefore seem to face the dilemma that

- $\dot{C} > \text{NGDP}$ is necessary to achieve optimal NGDP growth.
- But $\dot{C} > \text{NGDP}$ in perpetuity produces eventual crisis and post-crisis recession.

Is there a resolution to this dilemma? In the next three chapters I suggest that it lies in the fact that most credit is extended for reasons quite different from those described in the economics and finance literature.

¹⁰ As discussed in Section 9(i), it would be possible to argue that the dangers of a debt overhang effect can still be identified and countered within the context of a long-term inflation targeting regime, with the central bank responding to rising leverage in, say, 2004 because it presciently foresaw that this might lead to deflationary pressures ten years later. But this would be a strained and convoluted attempt to reserve pure inflation targeting.

4. DIFFERENT TYPES OF CREDIT: THE CENTRAL ROLE OF REAL ESTATE

As Section 2 described an extensive finance theory literature has reached broadly positive conclusions about the benefits of private sector leverage. Ross Levine's comprehensive literature survey of 2005 reports empirical findings that increasing private leverage is good for growth. Rajan and Zingales set out in 2003 a strongly positive assessment of the role of financial deepening, including the greater use of debt contracts.

Almost all of this analysis, however, is based on the assumption that credit is primarily or solely extended to businesses to fund new capital investment projects. And the potential benefits of increased leverage described in these accounts derive directly from that assumption.

- Townsend's theory of "costly state verification" relates to challenges in the funding new capital investment projects.
- Rajan and Zingales's account of the benefits of finance is almost solely focused on how businesses are financed.
- Articles which present mathematical models of the banking system, typically describe how "households" deposit money into banks, which lend money to entrepreneurs.¹¹
- And when economic textbooks describe the function of the banking system, they focus almost exclusively on intermediation from households to business.

The financial system in general, and credit extension in particular, is described as a system for the allocation of scarce capital to alternative capital investment projects.¹²

But as a description of the role and functions of credit extension in modern advanced economy, these accounts are inadequate.

Most credit in advanced economies is not extended to finance new capital investment projects, and that fact is, I argue, crucial to understanding the challenge of financial instability in a modern economy

Categories of credit extension

Exhibit 13 shows a breakdown of bank credit in the UK. 75% of bank credit is extended to households, and within this mortgage lending against residential real estate dominates. 25% of bank credit is to business, but a large and increasing share funds commercial real estate (CRE). (Exhibit 14) Only around 12% of bank lending in the UK is to companies not involved in CRE development or investment.

This broad pattern is found in other advanced economies. Exhibit 15 presents data from a forthcoming paper by Jordá, Taylor and Schularick. For a range of advanced economies,

¹¹ Thus for instance Gertler and Kiyotaki 2010 present a model in which "At the beginning of each period, each bank raises deposits in the retail financial market at the deposit rate R_t+1 . After the retail market closes investment opportunities for non-financial firms arrive randomly".

¹² This modern focus on credit extension to businesses mirrors that of earlier writers. When Wicksell described how banks could create and allocate new purchasing power, he assumed that this was allocated to "entrepreneurs". Joseph Schumpeter and Friedrich von Hayek explored the way in which credit extension to entrepreneurs could result in a higher level capital investment than would result if capital mobilisation required households to make freely chosen equity or debt commitments. The assumption that credit was solely extended to businesses/entrepreneurs, however, was a far more valid assumption in the early 20th century than it is today.

residential mortgage credit accounts for between 50% - 70% of total bank lending, and 70% for combined bank and non-bank lending in the US. In addition, current real estate lending typically accounts for around a further 20% - 25%.

The implications of these figures for the economic function of credit supply are complex. We should certainly not assume that there is something inherently inferior about real estate investment. In an advanced service intensive economy indeed, investment in new real estate development – whether residential or commercial – is inherently likely to account for a large share of capital investment. And high quality real estate development (of offices, shopping centres, leisure facilities and attractive urban spaces) can be as important to the advance of human welfare as investment in “machines”.

In addition it is important to note that even where credit extended against real estate involves no new real estate investment, it may be financing other categories of real investment. Business finance of non-real estate companies is often secured against real estate assets, and small business start-ups often gain finance secured against residential real estate. The complex implications of this for appropriate public policy are considered in Section 9.

But while recognising these complications, it is important to recognise that a large proportion of credit in advanced economies does not directly finance new business investment projects, and that this category of credit has consequences unrelated to the mobilisation and allocation of capital resources on which finance theory concentrates.

I suggest that it is useful to think about credit as being extended for three conceptually distinct purposes. (Exhibit 16)

- (i) To finance increased consumption.
- (ii) To finance actual new investment whether this is in “machines”, or in real estate.
- (iii) To finance the purchase of already existing assets. These existing assets could include equities or artworks or other collectables. Many private equity backed investments (e.g. leverage buyouts) are essentially leveraged purchases of already existing assets. But real estate assets are by far the most important.

The implications of the first category – finance of increased consumption – are considered in section 5 below. In this section I focus on category (iii) and on the subset of category (ii) which is new real estate investment.

In the real world credit and asset price booms in existing real estate are sometimes but not always intertwined with surges in new real estate construction. The pre-crisis booms in Spain, Ireland and the US saw both large price increases in existing residential and commercial real estate (CRE), and large construction booms. In the UK the new construction element was much less important, but not entirely absent.

But it is easiest to understand the dynamics at work and the implications, if we first consider the theoretical case of a pure existing assets credit cycle, and then consider the interrelationship with new real estate investment

Existing real estate finance: a pure example

Let us imagine the following conditions:

- We have an advanced economy with a stable population, making no new net investment in housing stock: gross housing investment covers repair and depreciation.
- There exist more pleasant/less pleasant, more favoured/less favoured, housing locations, with significant differences in price between these locations. These price differences reflect differences in location specific land value rather than in the constructed size or quality of homes.
- Average per capita income is growing, and as it grows, people choose to devote an increasing percentage of their income to competing for the enjoyment of locationally desirable housing. Housing location is a high income elasticity good.
- There exists a mortgage market which enables people to borrow to buy houses.

In this example, there would be:

- A tendency for the value of the more locationally desirable parts of the housing stock to increase not only in real terms but relative to average earnings. This would not be because of investment in new construction, but because of an increase in the value of the locationally specific irreproducible land.
- A steadily rising level of mortgage debt relative to income, i.e. an increase in leverage.

Now consider the impact of the following additional factors:

- A rising population, but a restricted supply of new housing land (as result of high population density and/or of environmental/amenity based constraints). In this case, there is at least some new investment in housing stock (it is no longer a completely pure existing asset case). But with restricted new land supply, the rising population would almost certainly result in
 - A still greater tendency for building/land prices to rise relative to income.
 - A still greater increase in mortgage credit relative to incomes/GDP.
- The effect of expectations, with individuals observing real house price increases, extrapolating their continuation, and either (i) buying not just in order to secure housing services but in the expectation of capital gain, and/or (ii) buying earlier than they otherwise would to be ensure that their ability to buy desired housing services is not undermined by a rise in prices to unaffordable levels. Such expectational effects would tend to:
 - Drive self-reinforcing cycles in both borrower and lender net worth and behaviour of the sort illustrated in Exhibit 11;
 - This would result in still higher house prices and a still higher debt to GDP level in the upswing of the cycle;
 - But it could also produce strong self-reinforcing downswings if expectations changed direction.
- A tax regime which favoured investment in housing over other categories of investment. This could be via some mix of (i) exemption from capital gains tax; (ii)

exemption from income tax on the imputed rent; (iii) mortgage interest deductibility. Most tax regimes include one or more of these favouritisms. The impact would be to increase yet further the rise in house price/earnings ratio, and mortgage debt to income.

Thus it is possible to imagine a pure (or near pure) existing asset example in which there is a very large and growing mortgage market completely (or largely) irrelevant to new capital investment. In the pure example:

- Credit extension would have no direct impact on investment expenditure occurring within the economy and thus would not necessarily have any impact on growth in nominal GDP.
- But it would result in an accumulation of debt which would make the economy vulnerable to debt overhang effects and a debt deflation cycle if at any time crisis occurred, risk aversion increased, and expectations of price increases were reversed.

These dangers are moreover highly relevant to real-world dynamics in advanced economies because of the dominance of real estate assets in total wealth.

- Real estate is not just one category of asset, but in advanced economies accounts for the majority of total national wealth.¹³
 - Looking at national account measures of non-financial assets, in both the UK and Germany, real estate dominates (Exhibit 17).
 - While for the UK, if we look at the total assets held by the household sector, financial and non-financial, we find that over a half of household wealth derives from the value of real estate. UK households hold housing and land assets with a gross value of £4.5 trillion. The total value of all financial claims on business activity is a smaller £3.2 trillion (Exhibit 18)
- This real estate wealth resides to a significant extent in the land on which the buildings sit rather than in the buildings themselves.
- And it is variations in the land value, rather than in the construction quality of the buildings, which are the main driver of changes in real estate value over time. (Exhibit 19)
- The interrelationship between credit growth and house price increases was as a result central to the origins of the 2007-08 crisis and observed in numerous countries. (Exhibit 20)
- And the reason for the greater oscillation over time in national wealth estimates in the UK as against Germany, visible on Exhibit 17, seems likely to reflect the greater role of credit induced movements in real estate and land prices in the UK economy than in Germany.

¹³ National balance sheet estimates have not been subjected to the same international standardisation as national income and expenditure and accounts. Comparison between countries is therefore imperfect. In particular, there is no standardisation methodology for the separation of real estate assets as between the constructed asset and the land on which it sits. Further analysis of land values would be valuable to test the hypotheses presented in this lecture.

A large proportion of credit extension in advanced economies thus has an impact not captured by most accounts in the economic and finance literature:

- Most academic analysis of the implications of credit extension has concentrated almost entirely on its role in mobilising and allocating capital between alternative capital investment projects.¹⁴
- But some of the most fundamental consequences of credit supply for financial and macroeconomic instead stability, derive from the interface between
 - The in principle totally elastic supply of private credit and money;
 - And the largely inelastic supply of locationally specific real estate and in particular the land on which it sits.
- This interface make the equilibrium price of locationally specific land indeterminate, and the credit and asset price cycle inherently unstable.

Leverage growth without inflation; but what about wealth effects and money?

Lending against existing assets (and in particular against scarce supply real estate) can therefore be an important explanation of the rising credit intensity of growth. In simple terms

- Some people/businesses borrow to buy existing houses/commercial real estate.
- This pushes up the price of real estate/land.
- Other people/businesses sell houses/commercial real estate (at higher prices) and accumulate money or money equivalent balances.

There is an increase in private credit on the asset side of the bank balance sheet and of private money on the liability side (or the shadow banks/non-bank equivalent). And there is an increase in the value of real estate, and thus of perceived aggregate net wealth. But there is no necessary increase in aggregate nominal demand.

The increase in leverage does however produce a debt overhang effect when inevitably the property bubble bursts, and aggregate net worth declines.

Two objections might be put forward against this model:

- That while there is no direct impact of rising mortgage credit on current aggregate demand, there could be an indirect wealth effect deriving from the increase in aggregate net worth. People would experience rising wealth as a consequence of rising building/land prices: this might induce them to spend more.
- That there is an increase in money holdings, and that this must inevitably feed through to inflation.

Either objection would seem to take us back to the pre-crisis orthodoxy that any dangers arising from excessive credit creation would show up in aggregate nominal demand and would therefore be appropriately constrained by the pursuit of an inflation target.

¹⁴ Kiyotaki and Moore, 1997 is one of the small minority of articles which do consider the possible impact of lending against a non-replicable capital asset, i.e. land.

For the reasons discussed in the Appendix, however, neither of these objections undermines the basic proposition:

- There can certainly be wealth effects on expenditure. But these may not be fully proportional to the increase in wealth, may vary over the cycle, and may be asymmetric between upswing and downswing. As a result we can still have credit growth running far ahead of nominal GDP growth.
- As for money effects, I argue in the Appendix that the idea that money quantities are good forward indicators of inflation, is simply not valid in economies where the vast majority of money does not serve a transactions purpose and is interest-bearing. As Benjamin Friedman indeed has argued “in retrospect the economics profession’s focus on money – meaning various subsets of instruments on the liability side of bank balance sheets in contrast to bank assets – turns out to have been a half-century long diversion which has not served our profession well.” [B. Friedman 2012]

Combined existing real estate and new construction cycles

In theory leverage and real estate asset prices could grow even in the absence of any new construction activity¹⁵. In practice, credit and asset price booms in existing real estate are often accompanied with construction booms. That was the case in, for instance, Spain, Ireland and the US before the crisis. It is also the case in China today.

Not only however are the phenomena often associated, they are also causally linked (Exhibit 21).

- Self-reinforcing cycles in lender and borrower net worth and expectations generate increases in the price of existing real estate assets and the land on which they sit.
- But these higher prices then appear to justify increased investment in actual new real estate construction.

This causal link increases yet further the difficulties of post crisis adjustment:

- In the pure existing asset case, there can be a severe debt overhang problem but there is no pre-crisis misallocation of real productive resources.
- In the combined existing asset and construction boom case, there are also debt overhang problems. But these are also compounded by:
 - Bank loan losses on real estate development loans which can impair new credit supply to all sectors of the economy.
 - The need to redeploy labour resources out of a swollen construction sector into alternative employment, which may be difficult due to specificity of skill.

¹⁵ Conversely it would be possible to imagine a pure construction case, with no changes in the price of existing real estate. This could exist if new land for construction was always available at very low prices (e.g. because of a limitless supply of edge of town agricultural land) and if there were no consumer preferences as between more desirable and less desirable specific locations. The crucial condition is that the relevant land is not a scarce supply factor whose price rises endogenously in response to demand.

- The fact that wages in traded sectors of the economy may have been driven to unsustainable levels by the construction boom, requiring nominal wage reductions to restore competitiveness.

All these factors contributed to the severity of the crisis and the difficulty of post crisis adjustment in Spain and Ireland, whose construction sectors grew to around 15% of GDP on the eve of the crisis.

In summary

Free financial systems can tend to produce sub optimally high levels of credit extended to finance both existing asset purchase and, at least for the period of the upswing, new capital investment in real estate.

We must not demonise lending against real estate.

- Mortgage markets can play a socially useful role in lubricating the exchange of existing housing assets between households and between generations, even in environments where they fund no actual new investment.
- In an advanced economy, actual new real estate investment will naturally account for a very significant share of total capital investment.

But there are naturally arising biases which mean that unconstrained financial systems will result in:

- Levels of mortgage debt and leverage which are above optimal levels.
- Excessive and wasteful levels of actual new real estate investment in the upswing of the cycle.

This carries implications for appropriate policy which are discussed in Section 9.

5. INEQUALITY, CREDIT AND INEQUALITY

Inequality has grown significantly in most advanced economies over the last 30 years. Since 1980, the bottom quartile of US earners have received no increase in real wages: the incomes of the top 1% have tripled. This increasing divergence is correctly identified as a major social issue, and its root causes widely debated. Globalisation of product markets has likely played a significant role: the impact of new technology may be even more profound.

The relevant issue for this lecture is the relationship between increasing inequality and the increasingly credit intensity of growth. It is almost certainly two way. Rising inequality may help explain the rising credit intensity of economic growth: and differential access to and reliance on credit can itself exacerbate inequality.

Inequality → credit intensive growth: “let them eat credit”

John Maynard Keynes believed that as societies get richer, the marginal propensity to consume would decline, creating a potential problem of deficient demand. [Keynes, *“The General Theory,”* 1936, Chapter 8] For reasons discussed in Section 10, I am unconvinced that such a secular tendency does indeed pertain. But within societies at any one time, richer people who receive incremental income are less likely to spend it, and more likely to save it, than poorer people.

As a result, rising inequality might well induce an increase in savings by rich people, not automatically matched by any increase in ex ante intended investment. Everything else equal, and in a closed economy, this might produce a deficiency of aggregate nominal demand.

This potential fall in aggregate nominal demand would however be offset if:

- The central bank in pursuit of an inflation/nominal GDP target reduced interest rates to stimulate consumption or investment.
- The financial system intermediated credit flow from richer savers to poorer borrowers, with the latter attempting to increase consumption despite low income growth.

A rise in the quantity of private credit/money and of private leverage would as a result occur. This rise would not produce excessive growth in nominal demand, and thus a rise in inflation above target, but would be required to offset the deflationary impetus which rising inequality would otherwise impart.

Exhibit 22 sums up the hypothesis: rising inequality may make it essential that credit grows faster than nominal GDP in order to achieve an optimal path of NGDP. Rising inequality is therefore likely to be another explanation of the rising credit intensity of growth.

Rising credit to finance consumption would not cause subsequent financial instability effects if all consumption credit performed the function usually described in economic theory i.e. to smooth consumption over the life-cycle on the basis of rational decision-making within the constraints of the individual's permanent income. People would borrow to finance consumption in excess of income in some time periods, and would have made rational plans to repay that borrowing at a later stage of life.

But if consumers borrow in an unsustainable attempt to make up for a deficiency of permanent income relative to required/desired/attempted consumption, then large build-ups of unsustainable debt will likely occur, leading to post-crisis debt overhang effects.

And the risk of such behaviour is greatly increased, if consumption can be financed by borrowing against the rising value of houses, whose prices are themselves endogenously driven by the supply of credit in the fashion discussed in Section 4. Such borrowing in turn increases the danger that when the asset bubble pops, debt overhang effects will be severe.

The combination of rising inequality and the self-reinforcing dynamics of credit and asset price cycles, can therefore result in an economy characterised by credit intensive growth and rising leverage but without an excess of nominal demand to which an inflation targeting central bank feels compelled to respond.

That indeed is the combination which Raghuram Rajan described in the first chapter – “let them eat credit” – of his highly perceptive book “Fault Lines”. [Rajan 2010] The US faced rapidly rising inequality, within a political system unwilling to countenance offsetting redistribution, and unable to implement the alternative measures (such as increased skills) which some economists believe might constrain that inequality. Lower income households therefore incurred debts which were only sustainable if house prices continued to rise. When the rise ceased and reversed, a severe debt overhang was the inevitable result.

Credit → inequality: leveraged asset plays and debt dependence

Rising inequality can drive credit intensive growth. But differential access to credit and differential pricing may also play a key role in driving inequality. At very least, this hypothesis merits closer analysis.

As Section 1 described, credit extension creates purchasing power. The impact of credit extension therefore depends on to whom that purchasing power is allocated.

- Credit allocation patterns can therefore have a significant impact on investment and growth rates. Preferential allocation of credit to industrial development projects, for instance, played a key role in the rapid post-war development of Japan and Korea. [Studwell 2013]
- But they can also have major distributional effects. Access to large quantities of credit on good terms to finance the purchase of already existing assets is one of the most tried and tested ways to become rich. The rise of today's Russian oligarchs depended crucially on their superior access to credit during the privatisations of the 1990s: several of them indeed established banks to ensure that access. Superior private equity returns may in some cases derive from superior operating skills: but they also often result from leverage in a rising market.

The distributional impact of superior access to credit can however reach far wider than the top end of the wealth distribution.

- In real estate markets which experience sustained long-term increases in real prices, driven in part by increased credit supply, initial small differences in endowments (such as parental help with deposits) can result in significant differences in credit availability and pricing, magnifying the dispersion of eventual wealth results.
- Conversely, borrowers with limited initial endowments are likely to face a higher price of credit, and may need to take more leveraged positions in order to enter the housing market, increasing the danger of negative net equity and repossessions in the downswing of the house price cycle.
- As a result, while large mortgage markets have been continually lauded in the UK and in the US, as a means to "spread wealth more widely" their impact could in some circumstances result in significant increases in wealth inequality. Figures for the UK illustrate that while easy mortgage supply undoubtedly played a role in increasing house prices, the recent gains have gone entirely either to leveraged buy-to-let landlords, or to homeowners who no longer have mortgages outstanding. (Exhibit 23) Easy mortgage credit availability may have increased wealth inequality in the UK.

Finally increasing inequality and credit usage by low income people is in some advanced economies driving the growth of very high priced credit, such as that provided by the U.K.'s "payday lenders". And the net effect of this may well be to further increase the inequality of permanent disposable income, effectively redistributing disposable income from poor to rich.

As David Graeber describes in his book "Debt – the first 5000 years" [Graeber 2011], the extension of high priced credit to people facing either temporary or permanent deficiencies of income, relative to consumption needs/ aspirations, has often played a major role in

trapping people in poverty (and in extreme cases in debt bondage). Awareness of this danger, indeed, lay behind the strictures against “usury” which were common to Islam and mediaeval Christianity.

Those strictures subsequently appeared incompatible with successful market economy systems, since they prevented the useful role of “non-state-contingent” debt contracts in the mobilisation and allocation of capital. Debt and leverage can clearly play a useful and welfare enhancing role.

But to understand the full impact of credit on our economies, we need to recognise that much credit extension is unrelated to the processes of capital investment mobilisation and allocation on which finance theory has almost exclusively focussed.

6. GLOBAL IMBALANCES: SAVER AND BORROWER NATIONS

Lending to finance the purchase of existing assets (in particular real estate) and lending to finance consumption in the face of rising inequality, are thus two possible explanations of why advanced economies experienced rapid credit growth without an inflationary impact which might have provoked central bank response. Another explanation, at least in the final decade before the crisis, is simply that the countries which experienced the most rapid credit growth also ran large current-account deficits: total demand increased, but an increasing proportion of it was spent on imports.

Global current-account balance imbalances increased dramatically, with increasing deficits in the US, and the peripheral Eurozone countries, and increasing surpluses, in particular Japan, Germany, and China (Exhibits 24 and 25). The flipside of those current-account surpluses and deficits were capital exports and imports. And just as modern economics and finance has tended to tell an optimistic story about the impact of increasing leverage on an economy, so too it has told a favourable story about the impact of capital flows, and for the same reason.¹⁶

- Debt contracts it is argued, facilitate the mobilisation and efficient allocation of capital resources to alternative investment possibilities.
- Free capital flows meanwhile are supposed to facilitate a globally efficient allocation of investment, with capital flowing from countries which have savings in excess of investment needs, to countries with investment needs unsatisfied by domestic savings.

Thus for instance, when the European Commission considered the potential advantages of “One market, One money” in a pamphlet in 1990, it explicitly recognise that net capital flows (and thus current account imbalances) might increase within a Eurozone from which exchange rate risk had been extinguished, but it saw that as an advantage which would drive the convergence of European productivity and living standards. [European Commission 1990]

But whereas capital flows in an earlier era of financial globalisation broadly accorded with this model – the UK before the First World War exporting surplus savings to fund capital

¹⁶ Turner 2014 sets out this argument in more detail.

investments in for instance Argentina – recent capital flows have been quite different in three crucial respects:

- Many of them have been from relatively poor countries to already rich: from China to the US.
- In general they have not funded high aggregate investment rates in the recipient countries. Instead they have usually funded increased consumption and given a further impetus to domestic credit and asset price cycles.
- And where they have been associated with increased investment that has most often entailed excessive investment in the real estate sector.

As a result modern capital flows, like many domestic debt flows, have not funded sustainable increases in capital stock which can generate the cash flows required to fund repayment. Part of Germany's surplus savings has funded wasteful real estate developments in Spain and Ireland which have produced no increase in those countries' debt servicing capacity.

But imbalances have created an international version of the debt overhang problem. Once sentiment turns and asset prices fall, countries which have accumulated unsustainable debt burdens feel constrained to reduce consumption and investment in an attempt to delever. The "sudden stop" in private flows into Spain after 2010 (Exhibit 26) was followed by both private retrenchment and a public commitment to austerity.¹⁷

But surplus countries feel no matching necessity to stimulate consumption or investment in an offsetting fashion. The resulting danger of an asymmetry of response between net debtor and net creditor nations, which greatly concerned Keynes in the debates about the design of the Bretton Woods system¹⁸, are essentially therefore an international subset of the more general problem of asymmetric response between net debtors and net creditor households and companies which Eggertsson and Krugman have explored. And they can produce a similar deflationary impetus.

The policy implication is that action to reduce global current-account balances, and/or to fund them in a different fashion is essential if a more sustainable growth path is to be attained. If China's large surpluses were entirely matched by equity or real property investments in deficit countries, their financial instability impact would be greatly reduced. As long as they take a debt form, and are matched by increased consumption in deficit countries rather than valuable investment, they will be a potential driver of instability.

As for "who is to blame" for current-account imbalances, the best guide to sensible policy is, as Michael Pettis has put it, to avoid "the inanity of morality" [Pettis 2013] Large current-account imbalances, sustained over many years and unrelated to useful capital investment in deficit countries, almost certainly reflect biases in policy in both surplus and deficit countries and can only be addressed by simultaneous action on both sides.

The challenge of achieving consensus and effective action is however immense.

¹⁷ Exhibit 26 shows the capital inflows which were the balancing item to and which financed Spanish current account deficits. Until the crisis, these flows were entirely private: private flows were then subject to a sudden stop and reversal; they were replaced by official flows via the ESCB Target 2 system.

¹⁸ See, e.g., Skidelsky, "*John Maynard Keynes*", 2003 (Pages 674-678)

7. A SUMMARY OF THE PROBLEM

Let me briefly summarise my conclusions on the problem we face. My argument is that:

Private sector leverage beyond some level causes harm

- For several decades private credit has grown faster than nominal GDP, and private sector leverage has increased. And it seemed that this rapid credit growth was required to achieve adequate GDP growth.
- Macro economics and finance theory treated this phenomenon as either unimportant or benign. Financial deepening was good for growth
- But there is a growing body of analysis which suggest that private leverage beyond some threshold is harmful because likely to produce instability, and post-crisis deflation. The higher the level of private sector leverage, the greater this danger.

Private sector leverage has been swollen by credit creation which is not essential to the growth process, but which creates financial and macro-economic instability. Modern finance theory focuses almost entirely on credit finance extended to fund capital investment, but in fact:

- A very large proportion of credit finances competition for the ownership of already existing assets, in particular real estate.
- A significant proportion finances consumption in excess of income in an unsustainable fashion: the demand for such finance is increased by rising inequality.
- Most global capital flows finance either increased consumption or excessive investment in real estate and provide additional impetus to domestic credit and asset price cycles.

To achieve long-term stability we will need to address these fundamental drivers of the crisis and the post-crisis recession.

8. POLICY DILEMMAS AMID POST-CRISIS DEFLATION

My main purposes in this lecture is **not** to consider what policies are appropriate today to escape from the debt overhang created by past policy errors. But I will make a few brief comments problems simply to reinforce the vital importance of policy reforms which can help prevent a repeat. The essence of my point is that if we first allow private leverage to grow to excessive levels, we end up with no good policy options, but struggling to choose between alternative imperfect tools and dangers.

There is general agreement that total economy leverage is excessive and needs to be reduced. But so far since the 2007/8 crisis we have not actually reduced total economy leverage. We have simply shifted it around, from private to public sector, or from one country to another.

- This was the pattern observed in Japan after the 1980s credit and property boom ended. Overleveraged corporates sought to delever but that depressed the

economy. Fiscal deficits rose in an automatic and usefully offsetting fashion: but produced a relentlessly rising level of public debt. (Exhibits 27 and 28) Total economy wide leverage in Japan, private and public combined is now far higher than in 1990.

- The same pattern has been observed since 2008 in, for instance, the US, the UK and Spain. Some private deleveraging has been achieved, but public debt has grown dramatically (Exhibit 29).
- And increased Chinese leverage meanwhile (see Exhibit 6) is a direct consequence of prior credit extension in developed economies. Faced with falling advanced economy demand in the aftermath of the 2007-08, the Chinese leadership used rapid credit expansion in China as, it appeared, the only available lever to maintain economic growth and employment.

In this environment there are no perfect policy responses.

- Fiscal austerity may be unavoidable because of concerns about public debt sustainability. But it is undoubted that the short-term impact is to depress demand and growth.
- And aggressive unconventional monetary policies – ultralow interest rates, QE, or lending subsidies such as the Bank of England’s Funding for Lending Scheme – are almost certainly better than the no action alternative. But they work by re-stimulating the very growth in private leverage which got us into this mess in the first place: they are bound to increase wealth inequalities given the distribution of ownership of financial assets; and they have complex international implications, whose consequences we see in recent emerging market turmoil.

Faced with this choice of imperfect alternatives, some economists have recommended previously taboo policy options. Both Ken Rogoff and Olivier Blanchard have floated the possibility that we might need several years of higher than 2% inflation to escape the debt overhang problem. [Blanchard, Dell’ Ariccia and Mauro 2010] In a lecture a year ago, I meanwhile argued that there could be extreme circumstances in which overt money finance of fiscal deficits – helicopter money – was the best choice. [Turner 2013a]

I doubt whether there is agreement here in Frankfurt on those propositions.

But we can surely all agree that it would be better not to get into this mess again. The long-term objective should be a more stable system. That means one in which growth is not accompanied by relentlessly rising leverage.

9. POLICY IMPLICATIONS: MANAGING THE QUANTITY AND MIX OF CREDIT

If the hypotheses set out in Section 6 are correct, three policies will be required to enable less credit intensive growth and to achieve a more stable economy.

- i. Actions which lean against the tendency of free financial systems to produce too much debt and in particular debt to finance the purchase of existing real estate, and, at times, to fund wasteful new real estate investment.
- ii. Actions to offset rising inequality.

- iii. Actions to address the fundamental causes of global current account imbalances. In deficit countries these actions are effectively covered by (i) and (ii) above. In surplus countries, such as China, they require action to address the fundamental structural drivers of excessively high national savings rates.

All three responses are necessary. Without effective action under (ii) and (iii) actions solely focused on (i) would probably be ineffective. But the question of how precisely to address (ii) and (iii) are far too wide for one lecture. I will therefore focus solely on the actions which can be taken within the arena of financial regulation and monetary policy.

In response to the crisis, global regulatory and monetary authorities have already introduced wide-ranging reforms. These include significant increases in bank capital requirements and forthcoming liquidity regulations; measures to improve the resolvability of major banks; requirements for central clearing in derivatives markets; and in some countries, measures to require structural separation between different categories of banking/investment banking activity. In addition, important measures to address shadow banking risks are still being developed.

All of these measures are important and will make a contribution to addressing financial stability risks narrowly defined i.e., reducing the likelihood of systemic instability and major bank failure. They are however inadequate to address the fundamental problem that a free financial system has a systematic tendency to produce too much of the wrong sort of debt.

A more radical reform programme is required. Exhibits 30-32 set out a summary of the possible dimensions of such a program. It is deliberately comprehensive and aims to stimulate debate. The following subsections discuss some of the details and the inherent difficulties and unanswered questions.

- i. Constraining credit as well as inflation
- ii. Interest rates an insufficient tool
- iii. Removing tax biases and taxing debt pollution
- iv. Hybrid contracts: avoiding the “non-state-contingent” trap
- v. Bank capital reform: more radicalism required
- vi. Managing the mix of credit: lender and borrower constraints
- vii. A new philosophy and the challenge of discretion versus rules

(i) Constraining credit as well as inflation

Low and stable inflation is insufficient for financial and macroeconomic stability. Central banks achieved it during the Great Moderation, but the advanced economies suffered the biggest financial crisis and the worst post-crisis recession since the Great Depression. Financial balance sheets matter but:

- Not because money is a powerful forward indicator of inflation.
- But because rising credit and leverage can be forward indicators of potential post-crisis deflation.

One possible response would be to try to salvage the primacy and sufficiency of the inflation target by stressing that it is both fully symmetric and very long term. Central banks, it could be said, should have been worried about the build-up of leverage in the pre-crisis decade because it might result in an undershoot of inflation targets a decade later. But while a clever rescue attempt, this is surely unconvincing. Central banks/macro prudential regulators need to pay attention to rising leverage, and to credit and asset price cycles, as risks in themselves.

Internationally agreed reforms already require a focus on the rate of growth of leverage. The guidelines for the Basel III counter cyclical capital requirement, say that it must be applied if credit growth is running faster than previous trend. But this implies that if the past trend had been credit growth of 10% per annum, versus nominal GDP growth of 5%, yet further credit growth at 10% per annum would be acceptable in perpetuity since in line with trend, even though this would result in relentlessly rising leverage.

The conclusion of section 2, however, was that beyond some point the level of leverage matters as well as the rate of increase. But it is also clear that neither theory nor empirical evidence can yet (or perhaps ever) give us a definitive figure for how much leverage is “too much”.

- Cecchetti et al have suggested the tentative conclusion that *“when corporate debt goes beyond 90% of GDP, it becomes a drag on growth. And for household debt we report a threshold of 85% of GDP, although the impact is very imprecisely estimated”*. But these figures should be seen as a stimulus to further theoretical and empirical analysis, rather than as a firm guide to policy. [Cecchetti, Mohanty and Zampolli 2011]
- Reinhart and Rogoff have set out a strong argument that public debt above some level is likely to have negative consequences, but the controversy over their findings suggests that it is not possible to specify a precise “too much” point. [Reinhart and Rogoff 2009]
- The same conclusion almost certainly applies to private debt levels.¹⁹

But the absence of a precise definable threshold cannot mean we ignore rising private leverage. Free financial system will tend over time to create private credit in excessive quantities and in a suboptimal mix. Central banks/macro prudential regulators will have to lean against that tendency.

(ii) Interest rates an insufficient tool

In the pre-crisis Great Moderation, central banks set interest rates to achieve target levels of inflation in the price of current goods and services: and they were largely successful. But low inflation was accompanied by strong credit growth and rising leverage. One possible response would be for central banks to use the interest rate to slow down credit and asset

¹⁹ Indeed any theory of optimal debt levels will have to integrate private and public debt considerations. The lower the level of public debt relative to GDP, the greater is the freedom for governments to offset the adverse impact of debt overhang effects but by running fiscal deficits and accepting an increase in public leverage. And guidelines for acceptable combined leverage will in addition need to reflect medium and long-term real growth prospects, in turn reflecting demographic factors and closeness to the technological frontier. For already mature advanced economies facing demographic slowdown or decline, unsustainable debt burdens (private and public combined) will be below those for emerging economies with strong medium-term growth prospects.

price booms: in the pre-crisis period this would have entailed setting a higher interest rate than required to achieve inflation targets.

This is indeed the policy proposed by Bill White, former chief economist at the BIS. His theoretical foundation is essentially Wicksellian but with a different policy conclusion to that which Wicksell himself reached. It is based upon the belief that for many years before the crisis advanced economies central banks were setting policy interest rates below the natural rate of interest, whose approximate value White infers from global growth rates. [White 2013] Thus while Wicksell assumed that the natural rate was unobservable, and that the appropriate policy target was inflation because stable inflation would itself indicate a correspondence between the money rate and the natural rate, White suggests that central banks need to be willing to reach judgements about the long-term sustainability of credit growth even if inflation is not running above target.

White's assertion that we can infer a natural rate of interest from global growth rates can be challenged. But I fully concur with his argument that we need to pay attention to credit and leverage developments even if they have no short or medium term impact on inflation. And there is undoubtedly one major advantage in using interest rates to lean against excessive credit creation: their impact is difficult to arbitrage: in Jeremy Stein's words they "get into all the cracks". [Stein 2013]

But there is also a major disadvantage, which follows from the central argument of this lecture that there are distinct categories of credit, performing different economic functions and driven by different dynamics. For the interest rate elasticity of credit demand is likely to be both highly heterogeneous by category and variable by category across the economic cycle.

In particular, the short to medium term demand for credit which finances the purchase of existing real estate assets is in some circumstances likely to be far less interest rate elastic than the demand for credit which finances non real estate capital investment.

- If households and property developers have become convinced that real estate prices are likely to grow at say 10% to 15% over the medium-term, movements in policy interest rates by a few percentage points would be unlikely to slow down the boom.
- But such relatively small increases could have a major impact on the economics of business investment in the non-real estate sector.

The essential problem is that Wicksell and White's assumption that there are just too relevant rates of return – the money rate and the interest rate – breaks down in an economy where credit can be extended to finance the purchase of existing assets whose price is endogenously influenced by the supply of credit. In this environment the expected capital gain return on existing assets also plays a major role.

This implies that while pre-emptive interest rates may have a role to play, they need to be combined with other policy instruments.

(iii) Removing tax biases: taxing debt pollution

The central problem is that a free financial system will tend to create too much credit and leverage: free market mechanisms do not automatically ensure that debt levels cease rising once they have reached an optimal level. Debt creation beyond some point has the

potential to produce adverse systemic consequences which are not apparent to individual economic agents, and not allowed for in private assessments of the economic consequences.

Excessive debt creation therefore has an externality effect: excess debt is a form of economic pollution. As John Cochrane of the University of Chicago has recently argued, the classic economic answer would therefore be to tax credit intermediation, either in general, or focusing on particularly troublesome segments, such as bank debt which is short-term financed. [Cochrane 2013]

In principle the proposition clearly makes sense: in practice, we would have no scientific basis for estimating an optimal calibration, since, as discussed in subsection (i) above, we lack a precise definition of the optimal level of leverage.

That cannot however be a reason to exclude this policy option.

And it would clearly be desirable to at least remove the large tax biases in favour of debt and against equity contracts which are pervasive features of almost all corporate tax regimes and present to varying degrees in many personal tax systems.

(iv) Encouraging equity and hybrid contracts

The problem we face derives essentially from the “non-state-contingent” nature of debt contracts. Indeed the problems are the inevitable flip side of such contracts’ advantages. Without the apparent fixity of debt contracts, it is unlikely (as Townsend and others have argued) that we could have achieved the mobilisation of capital required for successful economic growth. But it is that same fixity which creates the problems of default rigidity, rollover risk, debt overhang, which can produce Fisher style debt deflation cycles.

One potentially useful dimension of reform might therefore focus on designing and encouraging the use of new financial contracts which adjust more smoothly to changes in economic circumstance, sharing equity risk between investors and users of funds. In their forthcoming book *House of Debt*, Mian and Sufi suggest that “Shared responsibility mortgages” could be developed which would deliver the essential economic function of a mortgage (enabling house purchase without the prior accumulation of savings equal to house value) but which would reduce the exposure of borrowers to the leveraged impact of house price falls, and thus reduce the dangers of harmful debt overhang effects.

Such ideas clearly merit further consideration. But it seems unlikely that such products will develop spontaneously without public policy interventions focused either on deliberately encouraging such categories of contract, and/or deliberately discouraging the supply of more straightforward mortgage debt.

(v) Bank capital: still more required

There is a strong case for imposing much higher capital requirements on banks than those so far agreed within the Basel III framework, and for much stronger counter cyclical capital tools.

The Basel III reforms have significantly increased required bank regulatory capital, reducing the probability of bank failure. But the analysis which led to the setting of the standard [BIS 2010 and 2010] always assumed that we were striking a trade-off between:

- The benefits of financial instability, as measured by probability of bank failure, financial crashes and subsequent recession.
- And the disadvantages of any reduction in credit supply or any increase in the cost of credit intermediation.

But if it is the case that real economy leverage beyond some level can be harmful, then a reduced credit supply or increased cost of credit intermediation could itself be favourable. It is therefore almost certain that a more comprehensive analysis would suggest a significantly higher capital ratio requirement than that which Basel III imposes.

Anat Admati and Martin Hellwig have made a compelling case that in an ideal world, bank capital ratios as high as 20% to 25% would be optimal. That proposition merits serious consideration. [Admati and Hellwig 2013]

The Basel III regime also allows for the imposition of a counter cyclical capital charge of up to 2.5% of risk weighted assets. Given the strength and importance of the credit and asset price cycles considered in Section 4, a much larger change charge may be required.

(vi) Influencing the mix of debt

Higher general capital requirements, stronger counter cyclical capital buffers, and the use of interest rates in a pre-emptive fashion, could all play a role in leaning against excess credit creation and leverage. But they would all do so across the board, leaning equally against all categories of credit creation. My central hypothesis in this lecture is however that we need to distinguish different categories of credit creation driven by different dynamics and with different economic impacts.

That implies that optimal policy cannot avoid differentiation between the different categories of credit, and in particular been between credit extended to finance new capital investment and credit extended to finance the purchase of existing real estate assets.

Public policy in this regard will never achieve perfect discrimination. As Section 4 observed, it is important not to demonise real estate finance: in a modern economy investment in residential and commercial real estate inevitably accounts for a large share of all new capital investment. And good real estate development can be as important to human welfare as new “machines”. Lending against real estate is bound to account for a large share of all lending in an advanced economy.

But it is also important to recognise, as Section 4 argued, that the naturally arising tendency of a free market system can be skewed too much towards real estate, and in an unstable fashion.

There is therefore a strong case for regulation which leans against this naturally arising bias. This should entail some mix of: (Exhibit 32)

- Setting risk weights for real estate finance, whether residential or commercial, higher than those arising from the purely private assessments of potential losses which underpin the Basel II and Basel III internal rating systems. Mortgage credit and house price booms and busts could cause macro-economic harm via debt overhang effect even in cycles where they did not result in large losses to banks. Asymmetric net debtor and net creditor responses can be important even in circumstances where very few of the net debtors actually default. There are

therefore social externality effects of real estate lending which will not be reflected in private risk assessments.

- Constraining borrower behaviour via the imposition of maximum loan to value or loan to income ratios, whether on a continuous across the cycle basis, and/or on a counter cyclical basis.
- Imposing underwriting rules which require that mortgage borrowers must assess borrower credit worthiness by focusing on their capacity to repay out of cash flow, with no permissible assumption that house price increases will make the debt affordable. The UK has recently introduced rules which seek to achieve this effect.
- Constraining the supply or at least the aggressive marketing of very high interest rate consumer lending.
- The public sponsorship or licensing of categories of bank which are required to focus solely on the function which most financial literature describes – the provision of credit to businesses to fund either working capital or new capital investment.

(vii) The overall philosophy: and the unavoidable challenge of discretion versus rules

There are pros and cons to all of the policy instruments described above. Detailed analysis in the light of continually evolving experience would be required to determine the best mix and calibration of tools.

But the underlying philosophy is clear. Stable inflation is not a sufficient objective. We cannot assume that unconstrained financial systems will produce an optimal quantity and mix of credit. And we have to recognise the different economic functions of different categories of credit and the different dynamic determinants of their supply and demand.

We have to manage the quantity and mix of categories of credit: or at very least lean against identifiable biases arising from free market dynamics.

This management will require a far greater integration between monetary policies and prudential/macro-prudential policies than pre-crisis orthodoxy believed necessary and appropriate. And it will make it more difficult to define the precise targets and accountability of independent central banks/macro prudential regulators.

Inflation targets (ideally symmetric) should still be a crucial part of central banks' mandates. But central banks will also need – in their role as macro-prudential regulators – to have powers and responsibilities to lean against credit trends and cycles. In the absence of precisely definable targets for optimal leverage, that implies significant discretion.

That certainly leaves us in a very uncomfortable space: precise targets, responsibilities and accountabilities are highly desirable if possible. But we cannot escape this uncomfortable space. We are inevitably in it because of the inherent potential instability of a monetary economy with capitalist financial institutions which Hyman Minsky highlighted in the quote which heads this lecture.

10. SECULAR STAGNATION VERSUS RECURRENT INSTABILITY: AN UNAVOIDABLE CHOICE?

I began this lecture with a dilemma:

“We seem to need credit growth faster than GDP growth to achieve an optimally growing economy, but that leads inevitably to crisis and post-crisis recession.”

And I have suggested a resolution and policy implications:

- Our economies have become relentlessly more credit intensive because of three factors
 - Increasing inequality.
 - Global imbalances driven in part by a structural tendency towards excessive savings in some surplus countries.
 - The growth of credit extended to finance the purchase of limited supply existing assets (in particular real estate) whose price is influenced endogenously by the quantity of credit extended.
- Policy responses must address each of these three factors.
- Without such policies we are condemned to future instability. Financial reforms undertaken so far, while valuable, are inadequate.

But do we face a still more fundamental problem of “secular stagnation”, driven by factors other than the three I have identified?

- My central hypothesis is no.
- But if there is a more fundamental problem I suggest it derives from the changing nature of and relationship between wealth and investment in modern advanced economies.

Discussion of secular stagnation has been prompted by the fact that the recovery from the 2007/8 crisis has been exceptionally weak and slow. The assumption is that cyclical factors alone cannot explain this very poor performance: there must it seems be something else at work.

One set of hypotheses relate to supply-side factors. We may face a slowdown in the achievable rate of productivity growth at the frontier of technology and income levels; and/or technological factors may be driving increases in the dispersion of relative real incomes. There is, I believe, a strong case that both of these factors (the latter more than the former) may be at work. But in my comments here I will focus solely on hypotheses relating to demand.

How do the demand-side factors raised in the secular stagnation debate relate to my arguments?

A useful starting point is Larry Summers’ summary of why he takes the secular stagnation debate seriously. [Summers 2014] He cites four factors:

- (i) Despite “financial repair” (at least in the US) some four years ago, the recovery has been extremely weak.
- (ii) The pre-crisis decade saw credit booms and asset price bubbles but only moderate economic growth.
- (iii) Interest rates are at the zero bound, limiting our ability to drive faster recovery from recession.

- (iv) Falling wages and prices are (a) depressing consumption; and (b) redistributing wealth and income from higher spending debtors to lower spending creditors.

These four facts are consistent with my analysis.

- Factor (i) is focused on why recovery has been so weak: it is not in itself an indicator of a secular stagnation problem. And it is explained by the hypotheses I set out in Section 2 – debt overhang effects are stronger than many policy makers initially realised. Mian and Sufi’s “Debt View” is important alongside the “Bank View”: low credit demand has resulted in low credit growth even after “financial repair”, which is insufficient to restore growth in the face of a large debt overhang.
- Similarly factor (iii) relates to our current post crisis predicament, in which, as Section 8 argued, severe debt overhang leaves us with no easy policy options. Factor (iv) also relates to the post-crisis challenge.
- It is Factor (ii) which is the core of any secular stagnation hypothesis, and is the dilemma on which I have focussed: why was such rapid credit growth been accompanied by only moderate economic growth.

It is therefore possible that my hypothesis on how to resolve the dilemma is a sufficient answer to the supposed secular stagnation problem. If I am right, then the problems are indeed very deep and difficult, but they are not in principle insurmountable.

- Because of rising inequality and global structural balances we did indeed need rising credit intensity simply to achieve only moderate economic growth. But if we could fix these problems, then the need for rising credit intensity would disappear.
- In addition, we have a financial system which left to itself will allocate excessive credit to fund the purchase of limited supply existing assets (in particular real estate). This is not needed to ensure growth, but it builds up vulnerability to post-crisis debt overhang. If we could constrain it, we would have the same pace of growth without that vulnerability.

But is there something more fundamental still going on?

One indication that there might be is the long-term decline in risk-free real interest rates to close to zero levels before the financial crisis (Exhibit 33). That fall was probably partly explained by a combination of (i) an increase in the ex-ante desired global savings rate, in particular as a result of rapid increases in Chinese national savings (ii) the fact that a large share of savings, as a result of managed exchange-rate policies, were invested not in equities, property or corporate debt, but in risk-free government securities.

If this were the sole explanation, then my hypothesis on the solution – which includes addressing global imbalances – is still intact.

But are there other factors behind this remarkable long-term fall in real interest rates? The obvious place to look is in the relationship between ex-ante desired savings and investment:

- On the saving side, the idea of secular stagnation is clearly linked to the concern of some early 20th century economists that as people overall got richer, the savings rate would rise and consumption would be inadequate to drive growth. Keynes believed that “it is obvious that a higher absolute level of income will tend, as a rule, to widen the gap between income and consumption” [Keynes, General

Theory, Chapter 8]. And he was convinced that this tendency applied across time, and over long periods, as well as cross-sectionally within societies at any one time or over short periods. But post Second World War experience argues against this thesis. In a world where consumption is stimulated by relative status competition and advertising, it is not clear that there is any secular tendency for the propensity to consume to decline. Indeed the consumption share of national income has if anything increased over time.

- On the investment side however there appear to be some important, and at first sight contradictory, developments

Investment rates in the industrialised world have headed down since the 1970s. Summers suggests that one possible explanation is that “continuing declines in the cost of durable goods, especially those associated with information technology, mean that the same level of saving purchases more capital every year”. In investment terms we get more bang for our buck: but we therefore need less savings. This could help explain why equilibrium real interest rates have declined.

But as Thomas Piketty and Gabriel Zucman have illustrated [Piketty and Zucman 2013], wealth to output and capital output ratios have gone up significantly over the last 30 years (e.g. with wealth rising from around 2 to 3 times income in 1960 to 3 to 6 times today) and capital’s factor share in national income has also tended to rise, from around 20% to 30%: this is one of the factors in turn driving inequality.

How are these facts compatible? I suggest the following tentative hypothesis:

We are heading into an advanced economy world in which the role of investment in the sense that we have traditionally thought about it, while remaining vital for many human welfare improvements, plays a reduced role in explaining the accumulation of wealth.

- By investment we usually envisage the need to devote large quantities of economic resources (ultimately labour) not to the production of current goods and services but to the production of “capital goods”. Before we can produce cars and consumer durables we have to build factories.
- But in a modern economy we observe two phenomena:
 - The creation of huge market equity wealth on the basis of surprisingly little investment. By which I do mean not just little physical investment (software is of course as much a capital asset as factory machines) but also and more importantly a very small need to devote labour resources to the production of non-current goods and services. Facebook floated for \$100 billion: it employs only 5000 people: and the total number of man years devoted to building up the intellectual capital from which the equity wealth flows, was trivial compared with the man years required to produce earlier generations of capital goods such as new factories or railway networks. This phenomenon derives from the collapsing cost of information technology hardware as per Moore’s law: and from the zero marginal cost of software replication.
 - A large and increasing share of total wealth accounted for by locationally specific real estate (and the land on which it sits). This

share seems to grow as higher income people devote a higher percentage of their income not to buying newly produced goods and services, but to competing for the ownership of that limited supply and irreproducible asset²⁰. The value of this wealth increases over time and oscillates through the cycle, but neither the long-term increase nor the oscillations are primarily driven by new capital investment.

These developments are consistent with the conclusions I have reached in this lecture. But they suggest that the forces driving macro-economic phenomena may be even deeper than I have suggested, and may require even more fundamental rethinking of some economic theory.

²⁰ This competition can in turn derive from either/both (i) an actual desire to enjoy the housing services which flow from that ownership; (ii) a circular expectation driven belief that the building/land will be a good store of value, delivering capital gains over time.

APPENDIX

Lending to purchase existing assets, wealth effects and money

My proposition is that one reason why we have observed private credit growing continually faster than GDP, and leverage therefore relentlessly increasing, but without that producing an inflationary excess of nominal demand, is that a large proportion of credit is extended to finance the purchase of existing assets, and that this does not result in a direct increase in expenditure on current goods and services.

But what about wealth effects and resulting inflation?

But while in this model there is no direct impact of credit on current aggregate demand, there could clearly be an indirect effect deriving from the increase in aggregate net worth. If people experience rising wealth as a consequence of rising building/land prices, this might induce some combination of

- Borrowing against rising asset values to fund increased consumption: a significant amount of such “equity release” borrowing did indeed occur in several countries pre-crisis.
- Reduced saving out of income, since wealth accumulation objectives appear to be satisfied by rising house prices. Again there is evidence of that in several countries
- And, potentially, an increased propensity to borrow against rising real estate values to set up and invest in businesses. Whether or not this occurred, is as far as I know unknown.

Any of these effects would however tend to produce an increase in aggregate nominal demand, and might therefore return us to the pre-crisis orthodoxy that any dangers arising from excessive credit creation will show up in aggregate nominal demand and will therefore be appropriately constrained by the pursuit of an inflation target.

And it is certainly the case that wealth effects could be significant. Indeed, the debt overhang effect described in section 2, is effectively driven by wealth effects in the downswing: households and businesses reduce consumption or investment in the face of falling asset prices and thus net worth.

But the possibility of wealth effects does not undermine the validity of the hypothesis. For while there may well be wealth effects, there is no necessary reason why they should be fully proportional to the increase in private credit/ money and asset prices. Households enjoying an apparent increase in net worth may spend some of it but not all. And while the problem of debt overhang reflects a powerful wealth effect in the downswing, it is quite possible that the impact of wealth effects on current consumption and investment is strongly asymmetric. Many households which enjoy a rise in housing wealth or money balances in the upswing may simply observe with satisfaction an accumulation of apparent claims on future consumption, but leave current consumption unchanged; but households which suffer large leveraged falls in net worth are more likely to cut consumption rapidly and strongly.

If this asymmetry does pertain, increasing credit dedicated to the purchase of already existing assets can produce a severe deflationary post-crisis debt overhang effect, but

without that danger ever becoming apparent to central banks which are focused ahead of the crisis on the pursuit of an inflation target.

But what about money – and resulting inflation?

What about money? In my simple model outlined in Section 4, some households and corporate accumulate debt, secured against real estate, and others as a result accumulate money (or money equivalent claims). Bank balance sheets have to balance: non-bank debt claims and obligations also net to zero: if leverage increases, so too do money or money type claims in the financial system. In the UK, household debt was 15% of GDP in 1964 to 95% in 2008, but household bank deposits also rose from 40% to 70%.

Monetarist theory would suggest that this accumulation of money must result in inflation. Why did it not do so?

I suggest that the answer is clear²¹. The idea of a stable “demand from money” determined by the level of nominal income and by the rate of interest, as per the function $M_d=f(i,Y)$ is simply not valid in today’s economy and has been invalid for many decades. The theory was originally developed when it could be assumed that all or most money was non-interest-bearing transactions money, held in order to provide a means of payment, and with an opportunity cost set by the interest rate on bonds or bills. But most money today (at least before the current period of close to zero market interest rates) is interest-bearing. The opportunity cost of holding it is not determined by the interest rate on bonds or bills, but by the differential between interest rates on deposits and rates on bonds or bills, a differential which can be of either sign. And it is not primarily held as transactions money, but held as a form of debt investment which just happens to provide the additional benefit of slightly easier transformation into immediate money than other alternative debt investments.

There is therefore no reason why the quantity of money held will bear a stable relationship to money income at any given level of interest rates. There is in other words no reason why the velocity of circulation of money should be stable. In fact measured money velocity declined continually from the early 1980s in almost all advanced economies (Exhibit 34). For a time this was described, particularly in relation to Japan, as an “enigma”. But as Richard Werner has argued, there is no “enigma” to be explained. [Werner 2005] A falling velocity of circulation of money results directly and inevitably from the growth of credit extended to purchase existing assets, rather than current goods and services.

So again to be provocative, here in Germany, I argue that a focus on medium-term movements in money aggregates as supposed forward indicators of inflation is of little value. There are important questions about whether and to what extent credit induced changes in asset price trends will produce changes in current demand as a result of wealth effects. But focusing on money adds nothing to an analysis focused simply on wealth.

As Stiglitz and Greenwald put it “the focus of monetary policy should shift from the role of money in transactions to the role of monetary policy in affecting the supply of credit” [Greenwald and Stiglitz 2003]. And as Benjamin Friedman has argued “in retrospect the economics profession’s focus on money – meaning various subsets of instruments on the liability side of bank balance sheets in contrast to bank assets – turns out to have been a half-century long diversion which has not served our profession well”. [B. Friedman 2012]

²¹ A more detailed version of this argument is set out in Turner 2013b, Section 4 (iii)

Indeed that diversion has not only had adverse consequences for economic theory but for real-world policy. For one harmful consequence of the economic profession's focus on the demand for money was that when the relationship between money supply and the price level appeared to break down, central banks tended to lose interest in stock quantities. If velocity was so unstable over the medium-term that money supply trends carried only very weak or no implications for price stability (as became increasingly apparent in the 1980s) then the money supply was perceived to be unimportant. The true lesson should have been that bank and other financial assets, and in particular the aggregate level of debt, are important for reasons quite independent of their immediate or medium-term impact on price stability.

Monetary balance sheet aggregates matter, but that is

- Not because money aggregates are useful forward indicators of inflation.
- But because credit aggregates and rising leverage may be forward indicators of financial instability, post-crisis debt overhang and potential deflation.