

WEALTH, DEBT, INEQUALITY AND LOW INTEREST RATES: FOUR BIG TRENDS AND SOME IMPLICATIONS

Adair Turner

(Senior Fellow, Institute for Economic Thinking)

Cass Business School

26 March 2014

The 2008 financial crisis caused enormous harm. In most advanced economies output per capita is some 10-15% below pre-crisis trend: in several, median real wages are no higher than they were 10 years or even longer ago.

But even before the crisis, something seemed amiss in many advanced economies. The bottom quartile of American earners had received no increase in real wages for 25 years. And while the crisis resulted from two decades of rapid credit growth, that credit growth produced only moderate rather than exceptional output growth. We seem to be suffering a severe hangover, without even much of a party.

There is therefore a danger that reforms focussed solely on the financial system itself, and on the immediate causes of the 2008 crisis, will be insufficient to address more fundamental problems.

In this lecture I therefore consider four trends which not only have profound implications for financial and macroeconomic stability, but which are important in themselves, raising wide ranging challenges for public policy and for economic theory.

They are (Exhibit1): increasing inequality; rising wealth to income ratios; increasing private sector leverage; and much lower real interest rates.

- Increasing inequality. The bottom 20% of US earners have received no real wage increase since 1980: the top 1% have enjoyed a tripling of real income. (Exhibit2) In other economies the trend is not so extreme: but the direction is almost universal.
- Increasing wealth relative to income. As the French economist Thomas Piketty puts it "wealth is back". In the 18th and 19th century, total accumulated wealth was about 600% of national income: that fell to around 300 to 400% by the mid-20th century. It has returned to around 600% in many advanced economies. (Exhibit 3)
- Increasing private sector leverage. Exhibit 4 shows a calculation taken from Carmen Reinhart and Kenneth Rogoff of private sector debt as a % of GDP in 22 advanced economies. It rises continuously from 50% in the early 1950s to 170% on the eve of the crisis. And leverage is now rising very rapidly in many emerging economies – most dramatically in China.

- Falling real interest rates. In the late 1980s, an investor could buy a UK or US government index linked twenty-year bond giving a risk-free real return of around 3.5%: by 2007 that was around 1.5%: after the crisis it fell to zero. (Exhibit 5)

These trends are of fundamental importance. Indeed I argue in this paper that

- We cannot understand the crisis of 2007 -08 and the slow pace of recovery unless we understand these trends, their causes and the important inter linkages between them.
- Policies designed to contain financial and macroeconomic instability will be ineffective unless they respond to these fundamental changes in the shape of our economy.
- Understanding the linkages between these trends is key to answering the question Larry Summers has recently posed – whether, separate from the direct consequences of the 2008 financial crisis, the advanced economies face a longer term problem of “secular stagnation”.

I consider each trend in turn, and then how they fit together. I suggest some implications for economic theory and for public policy. I finish with an account on “secular stagnation”: what does it mean, does it exist, and how do these four trends relate to it.

Before I start on that journey however let me at least give a few indicators of where we are heading. We tend to assume that:

- Equity value is created by investment , and wealth is accumulated out of savings
...but in fact we see large equity value without much investment, and enormous wealth accumulation without savings.
- Banks take deposits from savers and lend money to finance capital investment
...but in fact banks create money and purchasing power, and most lending is unrelated to capital investment.
- In the “new economy” physical assets are less important.
...but in fact the value of land accounts for a relentlessly increasing share of total wealth.
- Economic growth will deliver widespread prosperity
.... but this may not be true in the face of information and communications technology.

As a result, we need new approaches both to economic theory and public policy.

1. Rising inequality

Pre-tax income inequality has increased dramatically in several advanced economies along two dimensions.

- In several countries, but not all, lower income earners have suffered very significant declines relative to the mean or median, and in some countries have ceased to share at all in rising average prosperity.
- In almost all countries, though to varying degrees, the top 10% of earners have pulled away from the median, the top 1% from the rest of the top 10%, and the top 0.1% or the top 0.01% done even better still, in a fractal pattern of ever increasing spread.

This increase in income inequality reflects both

- Increasing inequality of earned income.
- A tendency for the share of national income flowing to capital owners to increase at the expense of labour's factor share. This is related to the increase in the importance of wealth which is considered in Section 2. And it tends to increase inequality, since wealth and incomes from capital are more unequally distributed than earned incomes.

Why are these trends occurring? There are many factors at work.

- At the bottom end of the income distribution, globalisation of product and capital markets has undoubtedly played a role, reducing the free market value of lower skilled workers in advanced economies in the face of competition from low income countries such as China. In addition the decline of trade union power, in part itself a consequence of globalisation, has played a role.
- At the top of the income distribution changing social mores are important, and self-reinforcing. Top executive pay is set in a very imperfect market in which norms, benchmarks and comparators play a major role. The more that chief executives are paid on average, the more it seems reasonable to pay each chief executive.
- And the increasing "financialisation" of advanced economies has also been a major factor at the top end. In the US financial services accounted for 2.5% of GDP in 1950, and 8.3% in 2008 [Greenwood and Scharfstein 2012]. And as Thomas Philippon and Ariel Sheref have shown, remuneration in the financial sector has increased far more rapidly than that of people of similar skill level in other sectors of the economy [Philippon and Reshef 2011]. The increasing incomes of financiers plays an important role within the growth of the income of the top 1%.

But there is strong case that the most fundamental factor at work may be technological, and it is this factor, rather than globalisation or financialisation, which seems most likely to intensify yet further in future years.¹

We tend to assume that the market economy produces a rising tide which raises all boats. The industrial revolution took us from a world in which economic growth was either non-existent or so slow that perceptible increases in living standards took centuries rather than decades, to one where significant growth in output per capita is achieved each generation. Growth in output per capita in Western Europe was around 0.1% per annum from AD 1,000 to 1820 but rose to 1.5% from 1820-2000. [Maddison 2001]

Technological growth produced increases in output per capita which made possible rises in living standards. Technology destroyed some jobs, but new jobs appeared in their stead. Early Luddite fears that machines meant permanent destitution for workers proved unfounded.

By the mid twentieth century indeed most economists were confident that not only was technological progress compatible with full employment, but also with at least some rise in incomes for all groups within society.

But recent research illustrates that in the early stages of the industrial revolution, average real wages grew far slower than productivity. (Exhibit 6) [R.C. Allen 2009] From 1800 to 1830 indeed, average real wages in the UK grew not all, and wages for many individuals fell significantly. They still trailed behind output per capita in the period 1830 to 60, with the lion's share of rising prosperity accruing to capital owners not workers. Only in the last 40 years of the 19th century was average real wage growth rapid enough to ensure that almost all in society shared in rising living standards.

That illustrates that there is nothing certain about the translation of rising output per capita into rising living standards for all workers. It depends on the "elasticity of substitution" between capital and different categories of labour – how easy it is to apply capital to automate away labour intensive functions, how easy and costly it is to produce new capital goods, what types of labour (skilled or unskilled) are required to produce capital goods, and whether skilled labour is needed to operate capital goods.

The fact that in the mid-20th century, capitalism delivered rising prosperity for almost everyone in advanced economies, may therefore not have been inherent to capitalism and growth in general, but a fortuitous consequence of the specific technologies being applied at the time, in particular the technologies of electromechanical manufacturing.

Modern information and communications technology has some inherently different characteristics and may have quite different factor income effects.

Imagine that 30 years ago, someone had discovered a magic set of words that enabled you to hold a conversation with someone anywhere else in the world: "abracadabra 123 John"

¹ The impact of globalisation on unskilled wage rates in traded goods may decline as Chinese real wages grow relative to advanced economy levels

and you were talking to John wherever he was. What would have been the economic consequences?

Well as long as the discoverer was smart enough to establish an intellectual property right before revealing the words, she would have become the richest person in the world: her intellectual property lawyers would have done pretty well too, and her luxury goods providers, and her party organisers; and there would have been a lot of people serving at those parties. But nobody would have been employed in the production of the phone calls themselves – because as I have described it, all you need to do is say the magic words.

Information and communication technology is not pure magic, but in its economic effects it is far closer to it than were the technologies of the electromechanical age. When General Motors was at its peak, it employed over 800,000 people. Microsoft employs only 100,000, Apple 80,000, and Google 50,000. Facebook has an equity value of \$170 billion but employs only 5000 people: and it has recently acquired Whatsapp for \$19 billion, a company that employs just 55 people. (Exhibit 7)

Facebook's "capital assets" in the sense of its software, the "machine" which makes the system work, were created over 10 years by an annual average of something like 500 software engineers.² This "capital investment" of around 5000 man years is trivial compared to that which the early auto manufacturers had to invest in their factories, and which had to be invested in steel mills to produce the steel to build the car making machines, before cars could be produced and wealth delivered to auto company shareholders. WhatsApp's software, which underpins a \$19bn value was developed and is maintained by just 32 engineers.

This technology is quite different in its inherent economic characteristics and its potential impacts. A recent excellent and influential book by Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age* helps to explain why. [Brynjolfsson and McAfee 2014] Three aspects of this technology are distinctive:

- The collapsing cost of hardware capacity. Gordon Moore of Intel famously noted in 1965 that the amount of integrated circuit computing power you could buy for a dollar tended to double every year: he later suggested a revision to every 18 months. But whatever the precise time period, it's clear we face a pace of technological advance which is literally an order of magnitude – 10 times faster – than that achieved in the development of most previous technologies. And the super rapid pace applies not just to processing power but to other key dimensions of hardware capacity, such as memory and communications bandwidth.
- The zero marginal cost of software replication – the fact that once one copy of an operating system or application has been produced, another copy or another billion

² The total number of software engineers at Facebook is not precisely known, but in July 2010 it revealed that "we have over 1 million users per engineer and this number has been steadily increasing". At that time it had 500 million users, implying 500 software engineers. The engineer force would have built up to that level from company foundation in 2004. Users are now 1300 million, implying just 1300 software engineers even if there had been no increase in the ratio. It therefore seems unlikely that total engineer man years invested will be more than around 5000. The current market capitalisation of \$170bn could therefore represent \$34m per engineer year invested.

copies costs close to zero. This was not true either of cars or of the machines used to manufacture cars.

- And the huge importance of network externality effects: we all use Microsoft because we all use Microsoft; teenagers all use Facebook, because all teenagers use Facebook.

These distinctive features, Brynjolfsson and McAfee argue persuasively, have already had powerful economic effects, but will have still more powerful effects in future.

They will produce, they argue, great economic “bounty” – a world of accelerating opportunities to automate many activities now performed by unskilled or indeed skilled labour, and to deliver new products and services which we cannot yet even imagine. They suggest indeed that we have so far seen only the tip of the iceberg of what information and communications technology will do to the economy.

But they also argue persuasively that information and communication technology will prove an important driver of further increases in inequality.

The impact on inequality will result from the interaction of its effect on unskilled labour wages, skilled labour wages (for varying degrees of skill) and returns to capital.

- For unskilled or low skilled workers, it seems highly likely that the relative impact will be negative. As Brynjolfsson and McAfee set out, the development of effective robots and the computer automation of clerical tasks is likely to reduce the demand for less skilled workers, continuing the pattern of skill-based technical change which has been in evidence since the 1970s. More jobs may spring up in other areas (such as inherently face-to-face personal services) but relative real wage rates may be low.
- For skilled workers, the pattern may be highly variable. It is possible that the further progress in ICT described by Brynjolfsson and McAfee will lead to the automation of jobs we currently consider “skilled” – one recent analysis suggests that “Auditors and accountants” may be as vulnerable to replacement by machines as “Retail sales people” and “Telesales” operatives (Exhibit 8). But where human skills are needed alongside computing power to gain best results, return to skill may well continue to increase.
- In particular it seems likely that we will continue to see enormously high returns to very high skills – to stars and superstars, i.e. to the equivalents – small in total number but huge in income and wealth – of my imaginary woman who discovered the magic words for remote telephony.
- At this top end, moreover it may be increasingly difficult to distinguish whether the huge returns should be categorised as returns to high skills or to capital. The impact of rapid ICT progress on returns to capital is ambivalent.
 - In theory if new capital hardware is collapsing in price then returns to abundant capital could fall while returns to scarce skills rise. And where ICT hardware capacity is sold in a pure and simple form, we have indeed seen

instances of collapsing capital returns: many companies which installed fibre-optic capacity in the initial Internet boom lost money or went bankrupt, as the cost of new bandwidth collapsed.

- But this seems to be offset by hugely powerful network externality, intellectual property right and brand effects – once Facebook exists, the fact that it would be relatively cheap to replicate its hardware and software becomes irrelevant to the dynamics of competition and equity value creation. Whether the huge wealth of Bill Gates, Jeff Bezos and Mark Zuckerberg and other ICT entrepreneurs should be characterised as returns to highly skilled labour, to capital, or as rent arising from winner-take-all network externality effects, is therefore unclear³.

But whatever the best way of understanding it, the result is huge wealth accumulation without much “savings/investment”, i.e. without huge deferral of consumption either by the entrepreneurs themselves or by their capital backers, and without huge numbers of man years invested.

ICT therefore seems likely to have been a major driver of the increasing inequality we have already seen; and it may drive inequality yet further in future. It widens the divergence of earnings between reasonably skilled and low skilled workers: and it generates huge returns to very high skilled labour, luck, or dominant position.

These tendencies of increasing dispersion and superstar returns may moreover be present and given a further impetus by factors at work in sectors of the economy not directly affected by information and communications technology.

The future economy will almost certainly become far more ICT intensive, but that does not mean that everybody becomes an ICT-based worker. Indeed the very fact that we can automate many activities, will tend to create a future economy which is as much “high touch” as “high-tech”⁴

- Many jobs will be displaced by automation: other jobs will emerge. And the newly emerging jobs will almost by definition arise in those functions – such as personal face-to-face services – where it is least possible to bring technology to bear. The US Bureau of Labour Statistics foresees that the most rapid job growth in the next 10 years will come in areas such as “Home health aides”, “Food preparation and servicing workers”, “Personal and home-care aides”, “Nursing aides, orderlies and attendants” [BLS 2012] But while these “high touch jobs” may be large enough in number to maintain reasonable employment, the relative wage rates may in many cases be low.

³ This conceptual uncertainty is accompanied by an increasing fuzziness in national income distinctions between “earned income” and “returns to capital” if high-paid skilled staff are increasingly remunerated with stock options which then rise in value.

⁴ See Turner 2012 Economics after the crisis, and Turner 2001 Just Capital for a more detail development of this argument.

- Meanwhile as technology helps deliver increasing average earnings, and in particular if it delivers rapidly increasing incomes for the better off, then consumers will likely spend an increasing share of their income on goods with subjective value defined by design, fashion, or brand. But that in turn may tend to generate high returns to skilled people who, on the basis of relatively little “investment”, can create designs or brands which capture people’s attention and loyalty.
- And at the very top end, the superstar returns accrue not only to IT entrepreneurs, but to sporting and artistic celebrities or indeed to supermodels. Returns to very physical, non-automatable characteristics such as sporting prowess, artistic creativity, or physical beauty have greatly increased.

Our economy is going to be both more “high-tech” and “high touch”. (Exhibit 9) But in both spheres it may be increasingly unequal. And in both we may see huge wealth accumulation without significant investment.

Summary on rising inequality

There are of course many unanswered questions in this story. And as discussed earlier, there are other important drivers of inequality – including the financialisation of the economy.

But to conclude on inequality:

- Inequality has increased very significantly and there may be some inherent technological factors which will drive still further increases
- And those technological factors are driving the phenomenon of “equity value creation without much investment”.

The rising inequality is an important social issue in itself

But it is also relevant to the issue of financial instability. For as I argue in section 3, rising inequality is among the factors which has driven increasing leverage: and high leverage in turn can further exacerbate inequality.

Before considering that link, however, Section 2 focuses on the phenomenon of increasing wealth relative to income.

2. Wealth is back: but in some new forms

Over the last 40 years, the ratio of wealth to income has increased dramatically in most advanced societies. Thomas Piketty’s recent book *Capital* [Piketty 2014] and articles written jointly with Gabriel Zucman, explore the reasons and the implications. [Piketty and Zucman 2013]

The phenomenon is general across advanced economies though to different extents. On average wealth to income ratios (W/Y) have gone from around 300 to 400% in 1970 to

around 600% today. (Exhibit 10) In the countries where a very long term picture can be established – such as France and the UK – an interesting U-shaped pattern is observed. The ratio was around 600% in the 19th century, fell to 300 to 400% in the mid-20th century and has now returned to around a 600% level. (Exhibits 11 and 12)

“Capital is back”, as Piketty and Zucman entitle one of their articles.

Why has this occurred? The increase can be decomposed mathematically into two elements (Exhibit 13)

Explanation 1: Net savings and the s/g relationship

One cause of the increase could arise from the implications of the equilibrium relationship

$W/Y=s/g$, where W is wealth, Y is income, s is the net savings rate, and g the rate of growth of income.

This is not an accounting identity, nor a relationship which must exist at all times. But it is a relationship which must exist in an economy in equilibrium, i.e. in an economy where W is growing at the same rate as Y , and thus where W/Y is stable.

If $s/g > W/Y$ wealth will accumulate more rapidly than income, and W/Y will increase until the equilibrium relationship pertains. (Exhibit 14 illustrates this algebra)

One explanation of rising W/Y could therefore be that growth rates have tended to slow down as demographic expansion has slowed. Wealth to income ratios were very high in preindustrial periods because both demographic expansion and technological advance were very slow. The equilibrium W/Y level may have fallen in the mid-20th century when we experienced significant population and technological growth: it may now be rising because total growth rate potential has diminished.⁵

In one sense this story could seem odd. If growth potential has declined, would societies not naturally reduce their savings rate *pari passu*, since there would be a reduced need to accumulate capital? If for instance the population has ceased expanding, wouldn't we at least cease building new houses? If g falls, does not s fall in line?

But Piketty's thesis is based on the fact that aggregate national savings is not the result of a collectively rational decision about the capital accumulation rate required to support aggregate growth, but results from individual wealth accumulation objectives driven either by life-cycle motives (saving to secure a comfortable retirement) or bequest motives (saving to hand on wealth to one's heirs).

If savings are driven by these considerations, the savings rate is determined independently of the growth rate, and a lower growth rate can result in a higher equilibrium W/Y ratio.

⁵ It is possible that overall productivity growth potential has declined even if Brynjolfsson and McAfee are right that ICT will have a dramatic impact. This could be the case because while ICT produces dramatic productivity improvement in those parts of the economy which are inherently automatable, that very process increases the share of the economy where the inherent face-to-face nature of activities makes productivity progress difficult. It is therefore possible to combine the technological optimism of Brynjolfsson and McAfee with the arguments of Robert Gordon that the attainable rate of overall growth has declined [Gordon 2012]

Wealth to income ratios may therefore have increased because individuals keep saving even as growth rates and growth potential have fallen. And if growth rates slow further in future, Piketty surmises, W/Y ratios may further increase.

Explanation 2: asset price rises faster than current prices

In Explanation 1 wealth accumulates because of actual net savings and net investment i.e. because some of current income is devoted to saving/investment not to consumption: thus

$W_t + sY_t = W_{t+1}$ i.e. wealth at the beginning of the period plus savings (i.e. income not consumed) during the period, equals wealth at the end of the period

But wealth could also increase without any actual saving, if the prices of assets which form “wealth” rise faster than the prices of current goods and services which enter “income”. (Exhibit15) And Piketty’s figures show that this effect has played a major role in wealth accumulation in many though not all advanced economies.

There has been a lot of wealth accumulation without saving.

Thus for instance in the UK, the W/Y ratio would have fallen from 314% to 250% if wealth had only grown as a result of savings out of income. But the relative price effect contributed an increase of 270% (Exhibit 16)

Exhibit 17 shows a decomposition of the increase in the W/Y ratio between the “net savings effect and the “relative price effect” in the different countries which Piketty analyses.⁶

- In the UK, the US and Australia more than 100% of the increase in the W/Y ratio is due to asset prices rising faster than current prices. If wealth had only grown by an amount equal to actual savings out of income, the W/Y ratio would have fallen.
- In Germany and Canada by contrast net savings explain more than 100% of the rise in the W/Y ratio
- In France, Japan and Italy, something like 45-70% can be explained by net savings, with the balance arising from a relative price effect.

What is going on here? Well somewhat different things in different countries, and Piketty himself rightly stresses that his work should be a stimulus to further enquiries, rather than itself providing all the answers. But these figures illustrate that the relative price effect can be very significant: and at least three factors help explain that fact.

One that, Piketty stresses, is a “rebound” effect. In many advanced economies the first half of the 20th century was a period of great political and social dislocation Capital assets were sometimes destroyed by war, sometimes confiscated and often highly taxed. Equity and other prices were depressed by extreme instability. W/Y ratios may therefore have been depressed below their equilibrium value. From mid-century on the dislocations subsided

⁶ It is important to note that the “relative price effect” is not estimated directly, but as a residual once the “net savings” effect has been estimated.

and the political environment for wealth ownership became more favourable: we have therefore, Piketty suggests, returned to W/Y ratios driven by the fundamentals of s/g

But there are two other explanation, one of which Piketty's own figures suggest is powerfully present in at least some countries

- The first relates to the Facebook phenomenon considered in Section 1- a company worth \$170 billion after "capital investment" equal to some 5000 engineer years. If we were to decompose this specific slice of wealth creation into an identifiable "net savings" element and a residual, the residual would massively dominate. And that is true for many other information and communication technologies enjoying either intellectual property right, network externality or brand dominance effects. It is probably also true of companies which have developed valuable fashion or design based brands.

Quite apart from Piketty's rebound" effect, the modern "high-tech and high touch economy" may be one in which rising equity values are decreasingly explicable in terms of identifiable "capital investment/savings"

We have wealth accumulation without savings, because we have equity value creation without investment.

- The second, even more important in some countries, and indeed massively dominant, is the rising price of urban land.

Exhibit 12 shows the breakdown of the W/Y ratio between different categories of wealth for the UK: Exhibit 11 does the same for France. Two features immediately stand out:

- The declining importance of land as a form of wealth during the 19th century.
- The rising importance of real estate as a source of wealth in the last 40 years.

In both countries real estate now accounts for over half of all national wealth. And in both the increase in the W/Y ratio over the last 40 years is significantly driven by the rise in real estate values.

The share of land/real estate in total wealth, has therefore passed through a dramatic U-shape. But this isn't really one asset category falling and then rising importance, it is two quite different categories which just happen both to entail land:

- The 19th century trend reflects the declining relative economic importance of land as a factor input into food production, as food expenditure accounted for a declining share of total consumption.⁷
- The rise in real estate values over the last 40 years, reflects the rising value of residential and commercial real estate, particularly in urban environments.

⁷ In addition the value of land per se was reduced by the increasing application of technology to improve the yield from land, and the value of European land was reduced by competition from abundant land in the New World.

But within the modern real estate figures, it is land – urban land – which still plays a very major role. The available figures are imperfect, but at least in the UK the majority of the value of residential real estate is accounted for not by the constructed value of the house, but by the land on which it sits: and the vast majority of the increase in value, represents an increase in the value of the underlying land.

If all of you here in London this evening think about your own houses or flats, the pattern will be clear. You all occupy houses or flats whose market value today is a multiple of what it was in 1990 let alone 1970. In most cases, the house or flat was already there in 1990, and the net savings/investment which has gone into reconstruction or refurbishment explains only a very small proportion of the rise in value. Even where the house or flat is newly constructed, the cost of construction typically accounts for a small percentage of the current market value.

Once again, as with Facebook, we have wealth accumulation without capital investment/saving: but this time the asset involved is locationally specific land.

In most advanced economies, but to very different degrees, the value of residential and commercial real estate, and implicitly the urban land on which it sits, has increased in value far more rapidly than national income and as a result the W/Y ratio has increased.⁸ And in some countries, in particular the UK this effect explains the vast majority of the rise in the W/Y ratio. In some emerging countries too, in particular China, urban real estate and land prices are hugely important to wealth accumulation.

Why does this increase in land price occur? My hypothesis is that there is both a consumption preference and an investment asset class effect.

The consumer preference effect reflects the fact that as people on average get richer, they devote an increasing percentage of their disposable income to competing for the ownership of locationally specific land – for the right to live in the nice parts of town.

- Demand for many goods and services displays income elasticity below one: as we get richer we do not increase our expenditure pari-passu on more televisions, washing machines or food.
- Demand for locationally specific housing services however has an income elasticity considerably greater than one.
- So too does the demand for hotels close to the beach rather than far away, or for hotels close to the skiing piste rather than down the mountain. So too does demand for office space in the most convenient locations to attract high skilled workers.

But if locationally specific desirable land is inherently inelastic in supply, then the only thing that can give is the price of the land.

⁸ Both rents and capital values increase, but since real estate wealth and rent have a category specific W/Y ratio well above the average economy wide W/Y ratio, the higher the “real estate intensity” of the economy, the higher the aggregate W/Y ratio.

- The rental value of property/urban land will tend to increase over time as a proportion of income: Exhibit 18 shows the figures for France.
- And the capital value will tend to increase either in proportion (if the relevant interest rates/discount rate remains stable) or even more than proportionately if relevant interest/discount rates are falling (as indeed they have been – see section 4)

In growing advanced economies the W/Y ratio may therefore be on an inherent upward path because of an interface between:

- A highly income elastic demand for locationally specific land.
- And its highly inelastic supply.

That means that even in a country with a stable population, building no new houses at all, and thus where “new savings/investment” plays no role at all in the accumulation of the housing component of wealth, real estate could account for a steadily increasing proportion of total wealth, itself in turn rising as a multiple of income.

The investment asset class effect. The consumer preference effect will tend in itself to produce, on average over time, rising house prices relative to earnings. But once this phenomenon is observed, “investment” in housing in the pursuit of capital gain can give it further impetus, with property becoming an investment asset class, whose value is determined as much by the expectation of future capital gain, as by the consumer demand for actual housing services.⁹

- The extreme version of this is obvious at the top end of the London market, or in Dubai, Singapore, Hong Kong and other global cities: large luxury apartments bought but very rarely occupied; housing becoming a sort of arbitrary token of wealth, its value growing because buyers seeking capital gain assume that other buyers will subsequently pay higher prices.
- In the UK meanwhile we have a rapidly growing “buy-to-let” market, with residential property becoming an overt “asset class” for an increasing number of investors.
- But in many housing markets, this investment asset class effects plays a more pervasive role limited neither to the top end nor to explicit business investment. Many US sub-prime borrowers moved from rented accommodation to owner occupied houses in the expectation of capital gain: in the UK, young people have for several decades bought houses as soon as they can in the hope of capital gain, or simply out of fear that they would otherwise suffer an opportunity loss if house prices move out of reach. The language of “getting on the housing ladder” is a language relevant to housing as an asset class. For many people in advanced economies, housing is both a consumption good, and by far the most important asset class in which they will ever invest.

⁹ See Dorling 2014 for discussion of the way in which UK housing has become an investment asset and the implications of this development.

The extent of these effects however differs significantly by country. In almost all advanced economies real estate accounts for a large and growing percentage of wealth; but the dominance of the real estate price effect within wealth accumulation is far greater in the UK and France than in Germany, and far greater in Australia than in Canada. British people have for several decades saved via the purchase of houses: Germans do not do so to anything like the same extent.

The causes of these variations merit deeper analysis. One might imagine that high population density would make urban land supply more inelastic: but in fact real estate is far more important to French wealth than to German, even though France has a lower population density. Australia is a striking example of a country with high urban land prices despite very low population density. The details of economic geography and social preference – which locations are considered desirable, and whether high income groups tend to concentrate in one dominant city (London or Paris) or spread across many (the German cities) seem to be important.

But even if the real estate phenomenon is not equally important in all advanced economies, it is widespread enough to have large implications for global macroeconomic and financial stability.

For if we combine (Exhibit 19)

- A highly income elastic demand for locationally specific real estate
- An inelastic supply of locationally specific real estate
- And a speculative desire to make capital gain
- Or at least a strong desire not to lose the opportunity of living in one's desired location
- And the tendency, observable in almost all asset classes, for expectations of future price trends to be strongly influenced by recent actual trends

...then the value of urban real estate becomes highly indeterminate and potentially highly volatile over time.

There is effectively no meaningful “equilibrium” or “rational” value of locationally specific irreproducible urban land.

Summary thoughts on wealth: and implications

To sum up on this section, Piketty's analysis points to very important developments in the relationship between wealth and income:

- Overall W/Y ratios have increased
- Part of this may reflect slower growth: and part, a “rebound” effect
- But part reflects the increasingly important phenomenon of “wealth without saving/investment” reflecting both
 - Equity value creation without significant “capital investment”: the Facebook phenomenon.

- The rise in the price of locationally specific urban real estate, and essentially the irreproducible land on which it sits.

Piketty himself tentatively suggest that the global W/Y ratio may continue its recent rise throughout the 21st century (Exhibit 20). If the particular factors that I have highlighted are important, that increase could be still more significant even than he suggests.

The implications of rising W/Y ratios are profound, even if they now stabilise at today's higher levels, let alone if they rise higher still. They will tend to exacerbate inequality and they have direct implications for financial instability.

Greater inequality. In almost all societies wealth is far more unequally distributed than income. As wealth becomes more important inequality further increases;

- Increasing W/Y can make income distribution still more unequal. Higher W/Y does not necessarily mean a higher capital factor share of national income: indeed under some production function specifications it does not, with the rate of return on capital falling in inverse proportion to the amount of capital accumulated¹⁰. But Piketty illustrates that capital factor shares have increased in advanced economies, (Exhibit 21). Since wealth is very unequally distributed, an increasing capital share increases the inequality of total income (labour and capital income combined).
- And as Piketty rightly stresses, wealth inequalities may become self-reinforcing if the post-tax return on savings exceeds the rate of growth ($r > g$). Provided their consumption expenditures are not too high, already wealthy people can easily accumulate wealth more rapidly than the economy grows: people with smaller wealth are more likely to use capital income to support consumption.

This rising inequality should be a matter of some concern in and of itself. But as Section 3 will discuss, it may also drive increased leverage and instability.

More instability. But rising W/Y ratios can also have more direct instability consequences.

- Variations in private wealth levels can induce changes in consumption or investment expenditure levels which then have macroeconomic consequences.¹¹
- And the higher the W/Y ratio, the greater the potential impact of any given percentage change in W , on the expenditure flows which influence Y .
- But that danger is greatly amplified, if a large and increasing share of total wealth is accounted for by urban real estate whose "value" is highly indeterminate and potentially volatile.

¹⁰ This is for instance the property of the Cobb- Douglas production function often used to make analysis tractable; Cobb Douglas assumptions only hold however if the fundamental technological context is unchanged.

¹¹ It is also possible that these effects are significantly asymmetric. Increases in net worth may not feed through pari-passu to increases in consumption or investment expenditure in the upswing of the cycle (see appendix 3) but debt overhang effects and attempted deleveraging in response to a fall in net worth may have a strongly depressive effect in a post crisis downswing.

Rising W/Y ratios and the rising importance of real estate could therefore make the economy more unstable even if we lived in an all equity economy with no debt contracts. The potential instability increases yet further, however, if leverage is high and rising.

Section 3 considers the rise in leverage.

3. Rising private sector leverage

Exhibit 4 shows rising private leverage in advanced economies. As with trends in inequality and in the W/Y ratio, there are important variations between countries:

- In the US private leverage has grown continually from the end of the Second World War to the 2008 crisis, rising from around 50% to around 180% of GDP. (Exhibit 22)
- The UK has seen a dramatic increase in household leverage in particular, rising from 15% of GDP in 1964 to 95% by 2008. (Exhibit 23)
- In Germany, however, at least for the last 20 years, private leverage growth has been only limited, with a slight increase and then decline. (Exhibit 24)¹²

But on average the advanced economy trend has been strongly upward for many decades. In many emerging economies, in particular China, the same rapid increase is now seen. (Exhibit 25)

Private credit as a percent of GDP increased: obviously that means that private credit has grown faster than nominal GDP¹³. But rapid 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.¹⁴

This suggests 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.

Ahead of the crisis, however, a dominant orthodoxy treated this credit intensive growth and the resulting rise in leverage as either neutral in effect or benign:

¹² In some sense however Germany still displays credit dependent growth – it is simply that the credit growth occurs in other countries. In a world of close trading and capital market ties, variations in national data may therefore be less relevant than the overall global picture of rising credit intensity.

¹³ Broadly speaking over the two decades prior to the crisis, with earlier periods of high inflation behind us, advanced economies have grown nominal GDP at around 5% per annum: but private credit has typically grown at 10 to 15% per annum and sometimes considerably faster.

¹⁴ Central banks aimed for a rate of growth of aggregate nominal demand consistent with 2% inflation and real growth in line with potential. Their policy lever was the interest rate, which works in part through credit markets. The rate of credit creation compatible with target inflation was faster than nominal GDP growth. If central banks had increased interest rates to slow credit growth, then presumably nominal GDP growth would have been slower, with either lower inflation or real growth below potential.

- Central banks and modern monetary theory had gravitated to the belief that achieving low and stable inflation was sufficient for financial and macroeconomic stability, and that the details of the financial system and of aggregate real sector balance sheets could be largely ignored.
- Finance theory meanwhile stressed the positive benefits of debt contracts. And empirical studies appeared to suggest that increasing Bank Credit as a % of GDP was positively correlated with growth.

The financial crisis proved this orthodoxy profoundly mistaken. In a recent lecture in Frankfurt [Turner 2014], I argued instead that:

- Excessive credit growth is a key driver of financial instability and crisis.
- Once crisis occurs, the level of private leverage matters: the higher the level, the deeper and more lasting is the debt overhang effect and the slower and weaker the post crisis recovery.
- Beyond some level too much private sector leverage is dangerous.

The growth in private leverage illustrated in Exhibit 4 was thus a major cause of the 2008 crisis and the fundamental reason why the post crisis recession was so deep and recovery so slow and weak.

Appendix 1 sets out a summary of the key arguments presented in Turner 2014. In this lecture I will concentrate on how the phenomenon of rising leverage interrelates with rising inequality and changes in the nature of wealth.

Before turning to those specifics however, two key realities need to be recognised:

- Banks create money
- And most lending does not perform the function described in most economics and finance literature

Banks create money

Economic textbooks and academic papers typically describe how banks take deposits from savers and lend the money on to borrowers. But as a description of what banks actually do this is severely inadequate. In fact they create credit money and purchasing power. (Exhibit 26)

The consequences of this are profound: the amount of private credit and money that they can create is potentially infinite: how much they create, and the mechanisms which control that extent, are extremely important.¹⁵

Most credit not for investment

¹⁵ See Turner 2013 for discussion of some of the early literature (e.g. Wicksell 1898) which focused on this issue

Textbooks and academic papers also tend to describe the role of banks in the following terms: households deposit money into banks, which lend money to businesses to fund alternative investment projects. And finance theory explanations of the positive benefits of debt contracts describe how they make it easier to finance capital investment and/or ensure a more efficient allocation of capital between alternative investment opportunities.¹⁶

But this too is inadequate. Lending money to finance capital investment is part of what banks do but only a part. In addition (Exhibit 27)

- They lend money to finance life cycle consumption smoothing, enabling people to consume in anticipation of future income.
- They lend money to finance the purchase of already existing assets, in particular real estate.

Estimating how much of lending performs each of these different functions is complicated since:

- Broad categories of lending (to commercial real estate companies) can include some which finances actual new physical investment and some which finances the purchase of already existing assets as investment properties.
- Lending has both direct and indirect effects. Mortgage lending which drives increases in the price of existing houses, may thereby create incentives for new housing investment.
- Individual loans can serve more than one function: residential mortgages are simultaneously, but to different degrees, a means to achieve life cycle consumption smoothing, and a means to finance investment in an already existing capital asset in order to achieve capital gain.

But it is important to distinguish the conceptually separate categories and to recognise that leverage could be high and rising in a country in which “investment” was low and falling or was entirely equity financed. Indeed it is possible to imagine an economy in which, for instance, there was no net investment at all in the housing stock, but a high and rising level of residential mortgage credit.

A reasonable estimate for the UK suggests that less than 20% of all bank lending performs the function of “financing new capital investment” on which textbooks and academic papers tend to concentrate. (Exhibit 28)

The other categories of credit, as I argued in my Frankfurt lecture, help explain why pre-crisis growth was so credit intensive, but also why credit growth faster than nominal GDP is not essential and could be avoided with better policy.¹⁷

For the purposes of this lecture, the key implications are that:

¹⁶ See e.g. Levine 2004, Townsend 1979, Rajan and Zingales 2003, Gertler and Kiyotaki 2010. And see Turner 2014 for discussion of this literature.

¹⁷ Three reasons – including global imbalances not covered here.

- (i) Real estate lending plays a fundamental role in driving financial instability, and is both a consequence and driver of the changes in W/Y ratios considered in section 2.
- (ii) Lending to finance consumption can contribute to financial instability, and is both a consequence and driver of the increase in inequality considered in section 1.

(i)Lending against existing real estate

In all advanced economies (and many emerging) lending against residential and commercial real estate accounts for the vast majority of total bank lending. Exhibit 29 shows figures from a forthcoming paper by Moritz Schularick and Alan Taylor: residential mortgage credit typically accounts for 50 to 70% of lending and commercial real estate lending for another 20 to 25%.

This lending has three consequences:

- It is the most important driver of financial instability
- It helps explain the phenomenon of rapid credit growth without inflation
- And it gives further impetus to the rising importance of real estate within total wealth, explored in Section 2

Real estate lending and financial instability

Real estate lending in part finances actual new real estate investment – the construction of new homes, offices, shopping centres etc. But the majority, and in some countries the vast majority, finances the purchase of already existing real estate assets.

Thus while in Spain and Ireland, the rapid pre-crisis credit growth financed a boom in real estate construction as well as in the price of existing assets, the UK experienced rapidly rising mortgage credit and house prices, but only a moderate increase in net investment in the housing stock. (Exhibit 30)

Rapid credit expansion can drive over-investment booms and busts even in non- real estate sectors¹⁸ But the danger of self-reinforcing cycles is greatly increased when credit finances the purchase of irreproducible assets, such as locationally specific land, where the only thing that can give is the price of the land.

Lending against real estate which is in fixed or inelastic supply, is therefore highly susceptible to self-reinforcing cycles of the sort illustrated on Exhibits 31 and 32.

- In the upswing, rapid credit growth drives asset price increases. This in turn both increases the apparent net worth of lenders and borrowers, and creates expectations of further asset price improvements. Both the supply of and the demand for lending increase further as a result
- In the downswing, credit and asset price falls are equally self-reinforcing

¹⁸ See e.g. Hayek 1929 and Minsky 1986. The possibility arises in part from the long cycles involved in investment goods production, the resulting lack of an immediate relationship between supply and demand, and the response of entrepreneurs to unsustainable increases in the current market value of investment goods.

As a result lending against existing real estate (whether or not accompanied by a new construction boom) has played a central role in almost all financial crisis and periods of post crisis recession.

Rapid credit growth without inflation – but creating severe debt overhang

The high and rising importance of lending against real estate (and effectively against the land on which it sits) helps explain the phenomenon of rapid credit growth without increases in nominal demand to which inflation targeting central bank felt the need to respond.

The argument is set out in detail in Appendix 3. But the essence is:

Unlike lending to finance new capital investment, lending to finance the purchase of existing real estate does not directly result in new investment or new consumption

- It may do so indirectly via three channels. New real estate construction may be stimulated by “Tobin’s Q” type effects: investment in other capital goods through a combination of portfolio rebalance and Tobin Q effects; and consumption may be stimulated by wealth effects.
- But there is no necessary reason why these indirect effects will be fully proportional to the scale of credit extended.
- And it is at least possible to imagine a situation in which there is little or no feed through from higher credit, property prices and money balances to increased expenditure.

But while rapid credit extended against existing assets may not result ahead of the crisis in an excess of nominal demand, it will inevitably result in a severe debt overhang effect once crisis has occurred, expectations of real estate price trends have been shocked into reverse, and risk aversion has increased.

As a result high and rising leverage against real estate is not a forward indicator of future inflation

...but a very powerful indicator of future financial crisis, debt overhang and post-crisis recession.

Lending, real estate and wealth

As Section 2 described, most wealth in advanced economies resides in real estate. And a large part of the increase in wealth derives from rising land prices. As this section has described, most bank lending finances real estate.

The two facts are linked and self-reinforcing.

Section 2 described two drivers of increasing real estate/land prices relative to earnings: a high income elasticity of demand for locationally specific housing services; and the fact that housing and commercial real estate are treated as investment assets. The second driver is given further impetus by leverage.

As Exhibit 14 described, even without leverage the value of urban real estate/land would be somewhat indeterminate and thus potentially volatile. Leverage has one possible and one certain effect.

- It may tend to increase the average through the cycle value of real estate/land and thus give further impetus to the rise in the W/Y ratio. Rising leverage and real estate wealth are indeed likely to be self-reinforcing: greater asset wealth supports greater leverage; and greater leverage may give further impetus to wealth.
- And it certainly increases the potential volatility of real estate/land prices.

Indeed if we combine (Exhibit 33)

- The consumption and investment class drivers of demand for real estate
- The potentially infinite supply of private bank credit
- And the highly inelastic supply of locationally specific urban land

...there is in effect no equilibrium price of urban real estate/land

...and the real estate credit and asset price cycle is bound to be a major driver of instability.

Clarification: real estate development and lending are certainly socially useful

I want to clarify what I am saying and what not. Some people, responding to earlier versions of my hypotheses, have assumed that I am arguing that

- Bank should not lend against existing real estate
- Commercial real estate development and investment is socially useless

So let me be absolutely clear: I do not believe either of those propositions.

Indeed, as described in Appendix 2, I believe it inevitable that both inherent consumer preference and developments in technology will lead us towards an economy in which real estate accounts for a growing share of wealth, and real estate development a very large and growing share of total investment.

I also believe that good commercial and residential real estate development can be immensely socially valuable. And that there can be an important socially useful role for a

mortgage market, even in an economy which was not making and did not require any new residential real estate investment.

A more real estate/land intensive economy is inevitable. But we need to recognise that left to itself, a more real estate/land intensive economy will also be a more unstable and an equal one.

To prevent that requires policy powerful policy interventions.

(ii) Inequality begets leverage: "let them eat credit"

Section 1 described the phenomenon of rising inequality. It may in turn be one of the drivers of the rising credit intensity of growth.

J M Keynes was concerned that advanced economies might suffer a secular stagnation problem. He believed that it was "a fundamental psychological truth, upon which we are entitled to depend with great confidence both from our a priori knowledge of human nature and from the detailed facts of experience... that men are disposed, as a rule and on average, to increase their consumption as their income rises, but not by as much as the increase in their income" [Keynes 1937]. He thought that this tendency would apply over time to societies in aggregate, and worried that aggregate ex-ante desired savings would therefore run ahead of ex-ante required/desired investment, producing a deficiency of aggregate demand to which policy responses were required.

Experience has cast doubt on Keynes's assumption: in a world where people care about relative status as well as absolute consumption levels, and in which advertising is used to stimulate demands, there is neither necessary reason nor empirical evidence that aggregate national savings rates increase over time. If anything, savings rates have tended to decline in advanced societies.

But what is true is that within societies, richer people are likely on average to have a lower marginal propensity to consume than poorer, devoting a higher proportion of their income to saving. Rising inequality could therefore lead to a rising propensity to save, and to a deflationary impact on aggregate demand, unless offset by other factors.

Credit can be that other factor. Richer people may have a high propensity to save, but their savings can be intermediated through banking and other financial channels to provide credit to poorer (or at least "less rich") people attempting to maintain or increase consumption despite stagnant or falling real incomes.¹⁹

This credit flow and the consumption expenditures it supports does not however produce excess demand: instead it simply enables demand to be maintained at the level which would have pertained (without credit growth) if economic growth had not been accompanied with rising inequality. (Exhibit 34)

It inevitably results however in rising leverage and potentially serious debt overhang effects.

¹⁹ The motivations which lead "poorer" or at least "less rich" people (i.e. people with median or higher incomes but who are still not participating in rapid income growth), to seek to maintain consumption in excess of income through borrowing have been explored by Robert Frank in a series of papers [Frank 2001, Frank 2007, Frank, Levine and Dijk, 2010].

Rising inequality can thus generate credit intensive growth and financial instability. Marriner Eccles, Chairman of the Federal Reserve from 1934 to 1951, believed indeed that rising inequality has played a major role in the origins of the 1929 crash and subsequent great depression²⁰. [Eccles 1951]

Michael Kumhof and Roman Rancière have built a theoretical model which illustrates the dynamics, and argue that empirical evidence from both the 1920s and the decades running up to the 2008 crisis illustrate the importance of the inequality effect. [Kumhof and Rancière 2011]^{21 22}

Raghuram Rajan makes that a similar case in his book *Fault Lines* in a chapter entitled “let them eat credit”. [Rajan 2010] Faced with rising inequality, and in an American political system unable or unwilling to devise alternative offsetting policies, the extension of mortgage credit to wider groups of people appeared to be the answer. But it was an answer which led to instability.

In addition it may have played a role in further exacerbating the inequality to which it was a response.

Leverage begets inequality: credit access and credit dependence

Volatile asset prices combined with differential access to credit can further exacerbate inequality at both the bottom and top end of the income and wealth distribution.

Asset price fluctuations inevitably produce winners and losers. Leverage increases both the gains and the losses. But poorer people, with lower initial wealth endowments, are likely to face higher interest rates and, particularly in property markets, may be more highly leveraged. They may in addition be more vulnerable to income loss in labour market downswings. As a result they may be more likely, in the downswing of the cycle, to fall into negative equity and to suffer repossession, losing the opportunity of recouping losses in the subsequent upswing.

It is possible therefore that credit and asset price cycles have a systematic tendency to produce regressive distributional effects. Whether and to what extent this is the case merits

²⁰ He described the process as follows "a giant suction pump had by 1929 to 30 drawn into a few hands an increasing portion of currently produced wealth. This served them as capital accumulations. But by taking purchasing power out of the hands of mass consumers, the savers denied themselves the kind of effective demand for their products which would justify reinvestment of the capital accumulations in new plants. In consequence, as in a poker game where the chips were concentrated in fewer and fewer hands, the other fellows could stay in the game only by borrowing. When the credit ran out, the game stopped" [Eccles 1951, page 76].

²¹ In Kumhof and Rancière's model the inequality is between the top 5% and the other 95%. This may well reflect a reality that the quantitatively important element of the stimulus to credit intensity arising from inequality derives not from the behaviour of the truly poor (e.g. the bottom quartile) but from the efforts of the middle/less rich to keep up with the expenditure patterns of, say, the top decile or top few percent of the income distribution.

²² Bordo and Meisner [2012] find no in general link between inequality, credit booms and financial crisis, but argue that rising inequality did play a role within the origins of the 2008 crisis. Van Treeck [2012] surveys the relevant literature and points out that before the crisis both the actual extent of permanent rather than transitory inequality, and its potential importance, were downplayed, within a political climate in which concerns about inequality were unwelcome, and in which the easy availability of credit was seen as an integral part of the American dream.

further analysis. But it is notable that in the UK all the gains from house price increases across the latest cycle appear to have gone to buy-to-let landlords and non-mortgaged owner occupiers, rather than to owner occupier mortgagees²³ (Exhibit 35).

More generally, debt contracts – non-state contingent contracts which do not depend on a project or on the borrower’s economic fortunes – have throughout history played a role in exacerbating initial inequalities. Small initial variations in economic fortune – e.g. in the quality of the harvest and in the resources available to different farmers to withstand short term financial pressures – resulted in loan contracts between rich and poor which could produce long term dependency and even debt bondage. [Graeber 2011]²⁴

And in today’s economy, there is a danger that increasing reliance of poorer people on high interest credit, for instance from “payday lenders” could exacerbate the inequality of which it is also the consequence. The supposed benefit of consumer credit is that it enables smoothing of consumption across the life-cycle within a permanent income constraint. But if large amounts are borrowed at high interest rates, permanent income is itself significantly reduced.

Leverage also plays a major role at the top end of the income and wealth distribution. In a world of oscillating asset prices, and in which a large share of wealth increases derive from the relative price effect (Section 2) access to well priced credit in large quantity is often the key to superior returns. For many of the Russian oligarchs, for instance, superior access to well priced credit, including from banks they themselves controlled, was crucial to their ability to buy assets at very low prices during the 1990s.

But more generally in a world where W/Y is increasing, but prices also volatile, access to low priced credit to buy existing assets can be a self-reinforcing driver of wealth inequalities.

- Wealth provides collateral against which to borrow and leverage increases return in the upswing.
- If, therefore, as per Section 2, the relative price of some capital assets (in particular locationally desirable real estate) has a tendency to rise (i.e. $q > g$),
- ... then investors with good access to credit are likely to enjoy returns above the rate of growth ($r > g$ even without leverage and even more so with it)
- ...and a relentless divergence of wealth results.

²³ The exhibit also illustrates the very large gains made by people who own their property outright, without a mortgage. This in part reflects the fact that such owners are particularly present at the top end of the London market which has seen dramatic price increases.

²⁴ The belief that non-state contingent contracts therefore have and just results lies at the base of Islamic prohibitions of debt Reference to Islam, etc.

4. Falling real interest rates

How do falling real interest rates fit into the picture? This is the area where I am least certain of my conclusions, but I will set out some at least plausible hypotheses.

Exhibit 5 shows the facts. Since the late 1980s, long-term real risk-free interest rates – as measured by the real yield to maturity on government indexed-linked bonds have fallen dramatically. In 1989, the UK investor could buy a 20 year index linked gilts providing over 3% real yield to maturity: by 2007 that yield had fallen to 1.5%; it subsequently fell to below 0%: it is now around 0.75%.

The longer -term picture is inherently difficult to discern. Index-linked bonds were not issued before the 1980s. Estimates of ex-ante required/expected real returns before then therefore rely on comparing ex-post nominal realised returns with inflation rates; but this is not a robust methodology in periods which saw large and unanticipated variations in inflation rates. David Miles has however presented a plausible argument that today's real interest rates are well below those typical throughout the 19 century, when less volatile inflation rates make inference from ex- post realised returns a more valid technique. [Miles 2005]

It is possible therefore that we now face real interest rates lower than has been typical throughout the whole previous history of modern market economies.

The part of Exhibit 5's story which is most easy to explain is the fall to extremely low levels – indeed for a time negative levels – after the crisis of 2008. Debt overhang and private sector deleveraging placed downward pressure on market driven long rates. Large public debt issues could in principle have been a countervailing force, but any resulting tendency for rates to rise has been offset by central bank action, with short-term policy rates held at the zero bound, forward guidance to influence expectations over the medium-term, and QE used to flatten the long end of the yield curve.

But as Exhibit 5 makes clear, the 20 years before the crisis had already seen a very major reduction.

So why did this longer term fall in real interest rates occur? Theory suggests that it must have been because ex-ante desired savings rose relative to ex-ante desired investment.²⁵ Explanations therefore concentrate on either a rise in ex ante desired savings or a fall in ex ante desired investment.

The savings explanation often focuses on China and other large current-account surplus countries. Ben Bernanke argued in 2005 that high Chinese savings rates, in excess even of China's high rate of investment, had generated demand for US government bonds, depressing yields. [Bernanke 2005] The ex-ante desired global savings rate may thus have risen relative to desired global investment. It is credible that this is part of the explanation, rebalancing of the Chinese economy is certainly an important policy priority for global macro stability.

²⁵ Reference to section 2 point that savings not determined by rational collective process.

But Chinese surpluses large enough to have a significant impact on the global savings/investment balance only arose in the five years or so before the 2008 financial crisis, whereas the fall in real yields began some 15 years before that. An alternative or additional explanation in terms of falling advanced economy investment may therefore be required.

Larry Summers has advanced such a case within the context of his discussion of “secular stagnation” Real interest rates, he has observed, were at historically low levels in the decade before the crisis, credit growth was rapid, but nominal and real growth were only adequate, in line with inflation targets and real growth potential, rather than excessive. The explanation, he suggests, might lie in low underlying investment demand.

Work by McKinsey Global Institute in 2009, provides some support for this hypothesis, suggesting that falling advanced economy investment as a percent of GDP played a bigger role in driving lower real interest rates than the rise in Chinese or other savings rates (Exhibit 36). Business investment in many advanced economies has indeed been on a downward trend. Many large corporate are sitting on large cash balances. Many indeed have become net holders of financial assets, rather than net borrowers from the financial system. In the UK, borrowing by businesses outside the commercial real estate sector has fallen as a percent of GDP in the last 25 years, (Exhibit 37) Some sectors, such as manufacturing, have at times been net depositors into the banking system.²⁶

One possible explanation for this phenomenon has been advanced by Andrew Smithers, who suggests that modern remuneration practices create perverse incentives for managers to privilege financial engineering over real investment. [Smithers 2014]

But an alternative explanation is that many businesses simply face declining investment needs, because of the falling price of many capital goods, resulting from the trends in information and communications technology described in Section 1. Thus:

- Information and communication technology investment plays an increasingly important role as the driver of productivity growth in many companies.
- It keeps falling in price as a result of Moore’s law and the zero cost of software replication.
- Aggregate ex-ante desired/required business investment demand thus falls, driving a fall in the real interest rate.

Thus the phenomenon of “equity value creation without investment” considered in Section 1, may be a key explanation of the two decade-long fall in real interest rates.

Those low interest rates in turn carried implications both for the rise in W/Y ratio considered in Section 2, and for the rise in leverage and resulting financial instability, considered in Section 3.

- Falling real interest rates implied higher capital values relative to capital income streams. They thus gave further impetus to the rise in the W/Y ratio, driving up

²⁶ See Turner 2010 in LSE The Future of Finance.

prices of both equities and real estate markets²⁷. Exhibit 18 illustrated the rise in urban real estate rents, reflecting fundamental consumer preference factors: the impact of this on real estate prices was further magnified by lower interest rates. Increases in price, in turn, then generated expectations which drove investment in pursuit of capital gain.

- Low long-term interest rates also facilitated increased mortgage market growth, particularly in those markets, such as the US, where mortgages are priced relative to long-term interest rates. They therefore directly stimulated the increase in leverage.
- In addition low long-term rates gave major impetus to the “search for yield” which created demand for mortgage and other securities, and for the apparent wonders of financial innovation. Pension funds and other long-term investors facing risk-free real yields of only 1.5%, rather than the over 3% available in the late 1980s, were highly susceptible to investment banker claims that clever structuring and use of derivatives had enabled them to create securities which delivered additional yield without commensurate additional risk.

Lower real interest rates can thus play a key role in magnifying the overall impact on W/Y of the technological factors considered in Section 1. Thus (Exhibit 38):

- In a world of “equity value creation without investment” low demand for capital goods depresses real interest rates.
- But low real interest rates give further impetus to the rise in asset prices (in particular real estate prices) relative to current prices.
- The phenomenon of “wealth accumulation without explicit savings” (i.e. without deferred consumption) is therefore magnified.
- And further magnified by rising leverage which is both a response to rising asset prices and which (at least for a time) still further stimulates that rise.

Lower demand for savings to finance new capital investment, thus drove a fall in interest rates which, along with expectations of rising real estate prices, stimulated borrowing to purchase existing real estate.

Two questions could be raised in challenge to this hypothesis:

- Why did the increasing demand for credit to buy existing real estate not offset the impact of low demand for capital investment, leaving the equilibrium real interest rate unchanged?
- Is it really true that investment needs in advanced economies have reduced?

Existing real estate, credit demand and the interest rate

²⁷ And also of government and corporate bonds.

My answer to the first question, posed in a recent meeting by Larry Summers, is set out in Appendix 3. The essence lies in the fact that credit and money creation, and existing asset price increases, carry no necessary implications for the balance of ex-ante (or ex post) savings and investment, and thus no necessary implications for the equilibrium interest rate. This is because:

- As stressed in section 3, banks do not lend out existing money, but create money and credit de novo; bank lending creates its own funding; nobody has to be induced to defer consumption to make such lending possible.
- Lending to purchase existing real estate, and increases in the price of that real estate, do not carry necessary, direct and fully proportional consequences for increased nominal demand whether in an investment or consumption form.
- There is therefore an asymmetry: lower interest rates can stimulate real estate credit and asset price booms, but without that increased lending/borrowing driving any necessary offsetting tendency for the interest rate to rise.

But have investment needs really reduced?

We observe declining business investment as a percent of GDP; but many commentators are convinced that advanced economies need to invest more in areas of infrastructure – meaning for instance transport, power supply, or green energy. Can we reconcile this perspective with the hypothesis that declining real interest rates are explained by a declining business investment requirement?

The answer here may lie in distinguishing between different categories of investment, subject to very different price trends, and with different factors determining whether actual investment is in line with a socially optimal level. The need for investment of the sort which purely private non-real estate companies typically finance may be declining, even while there exist unmet investment needs which require greater support from public policy

I suggest therefore a tentative hypothesis based on the distinction between investment in “machines”, in “real estate”, and in “infrastructure”.

- By “machines” I mean all the forms of equipment and robots, the information systems and software and the apps, in which purely private businesses in multiple sectors (manufacturing, retailing, media) need to invest in order to produce their goods and services. On average the dollar cost of this investment is falling rapidly under the impact of the technological factors considered in Section 1. There are not in general unmet “needs” in this category of investment²⁸: rather required investment as a percent of GDP is falling; real interest rates have fallen as a result.
- Real estate investment (residential and commercial) meanwhile accounts for an increasing percentage of private business investment; costs of construction are not subject to the same ICT driven reductions. But in this category too socially optimal

²⁸ Small business innovation point

investment needs are adequately met by the private financial system. Indeed given the bias of the system to lend against real estate, and the interrelated nature of credit and asset price cycles in both existing real estate and new real estate construction, there is a danger of occasional excessive investment of this sort.

- But an increasing proportion of socially optimal investment is also accounted for by “infrastructure”.²⁹ And achieving an optimal level of this investment may require some combination of:
 - The intelligent design of regulatory regimes (for instance as relating to future energy market competition and prices).
 - Public-private partnerships.
 - And in some cases pure public investment.

If these requirements are not in place, infrastructure investment may be below the socially optimal level.

It is therefore I suggest possible that we might face inadequate infrastructure investment, even while pure private business investment in non-infrastructure is perfectly adequate despite falling as a percentage of GDP as ICT intensive capital goods fall in price.

An economy with such varying trends in the balance between need and supply in different categories of investment, will however have very different dynamics from one in which private investment in “machines” accounted for the dominant share of total investment.

5. Complex interconnections, fundamental factors and a new/old economy

Exhibit 39 sets out the multiple complex interconnections described in the previous sections.

- The extraordinary progress of information and communications technology drives both increasing inequality and the phenomenon of massive equity value creation with little investment. Inequality in turn contributes to the rising credit intensity of growth; and equity value without investment drives a higher W/Y ratio.
- But rapid technological progress also drives rising (if unequally distributed) income, and that drives both demand for brands and design, and for locationally specific property. Further impetus to the rising W/Y ratio results.
- The falling cost of capital goods, driven by technology, also results in low ex-ante investment demand, which produces lower real interest rates. These in turn facilitate rising leverage; and higher leverage both produces and is stimulated by rising property prices.
- Rising W/Y feeds back to rising inequality.

²⁹ Investment in science as another possible area of underinvestment

- Debt contracts and differential access to and pricing of credit in turn exacerbate inequality.
- And the rising credit intensity of growth, produces rising leverage, which results in financial instability, debt overhang and post-crisis recession.

Underlying these multiple and self-reinforcing connections, however, it is useful to identify the fundamental factors at work. I suggest there are four:

- Information and communication technology. The case which Brynjolfsson and McAfee make is compelling: this technology is highly distinctive and powerful in its economic effect. The end point of the trends they describe is a world in which we have automated everything that can be automated – in which robots powered by solar energy perform an ever-increasing number of functions, and crucially, build evermore robots to perform more functions. This end point will for long and perhaps forever belong to science fiction³⁰. But it is worth noting that if did we reach that end point the implications for social welfare would be ambivalent. At one level it would be nirvana – the challenge of production permanently and completely solved. But it might also be a world of enormous inequalities in which the ownership and inheritance of irreproducible assets played a very important role. The more we head in that direction, the more unequal our society may be.
- Consumer preference, and remember here that what matters for the shape of the economy is not the un-weighted average all consumer preferences, one person one vote, but consumer preferences weighted by the unequal distribution of income. If at least some people get considerably richer, they will I suspect choose to spend an increasing percentage of their income on goods and services which are brand and design intensive, and in competing for the ownership of positional goods, in particular locationally specific property. They may also seek – in pursuit of life-cycle or bequest motivations – to save a proportion of their income which is only compatible with maintained nominal demand if other (poorer) people dis-save.
- Credit and money, which banks can create in infinite quantities. An infinite potential which, if it expresses itself in investment or consumption expenditure which forms part of nominal GDP, may be constrained by the action of an inflation targeting central bank. But which if it finances competition for the ownership of already existing assets, can produce relentlessly rising leverage and asset prices, at least until the crisis occurs.

³⁰ Press reviews suggest that Jeremy Rifkin's forthcoming book on the "The Zero Marginal Cost Society" attempts a description of that end point. [Rifkin 2014] He also suggests that a possible consequence is "Collaborative Commons and the Eclipse of Capitalism". And it is true that if capital goods continue to collapse in price via the impact of Moore's law and zero cost replication, one possible implication is that returns to "capital" accumulated out of investment/saving disappear. But if in this economy there continue to be either inherently irreproducible assets, such as desirable urban land or land with vital raw materials, and if brands, intellectual property rights, and network externality effects result in high returns to capital/ rents even where the relevant assets could in theory be replicated at low cost, then the result might not be an eclipse of capitalism but an extremely unequal variant of capitalism.

- Inelastic supply or wholly reproducible capital assets, whose supply cannot easily be expanded by new capital investment. Real estate and the land on which it sits is the most important such asset. But brands and intellectual property rights are also key. Building a new Facebook would not take many engineer years: but Facebook's \$170bn equity value is underpinned by brand, IPR, and network externality effects.

These four factors, I suggest, have a very important influence on the shape and dynamics of the modern economy, and may do so increasingly in future.

So what does that modern economy look like? It is (Exhibit 40):

- Both hi-tech and hi-touch. An economy in which robots and software and apps play a pervasive role, but where brands, design and irreproducible land are also of great value. And an economy where, because every function which can be automated is automated, employment is concentrated in functions such as face-to-face services which cannot be automated, but in many cases at low wages.
- An economy where “wealth is back”, and in which we see equity value creation without investment, and wealth accumulation without saving.
- It is, unless we take deliberate action to prevent it, increasingly unequal.
- And it is, unless we take deliberate action, inherently susceptible to instability

Strangely in some ways (though certainly not all) it is more similar to pre-industrial society than was the mid-20th century economy which resulted from the maturing of the first machine age. Wealth is back, land is back, and inheritance of capital is more important.

6. Implications for economics

Modern macro economics and finance theory failed to provide us with any forewarning of the 2008 financial crisis. Worse indeed, the dominant orthodoxies strongly asserted either that developments in the financial system were of no macro consequences provided inflation was low and stable, or that financial deepening and innovation were making a powerful contribution to increased financial and macroeconomic stability.

Many of the assumptions and methodologies which underpinned modern macro-economics and finance need to be challenged and changed. The hypotheses I have presented in this lecture suggest four areas in particular where more focus is required and/or where greater integration is needed between different areas of economic thinking.

- Capital asset stocks. The importance of capital stocks needs greater focus, building on Piketty's ground-breaking work. As Piketty points out, the development of national statistics on capital stocks has lagged far behind the development of national income and account flow data. That in turn has both reflected and contributed to a lack of theoretical focus on the implications of accumulated capital

stocks, on the mix between reproducible and irreproducible assets, and on the implications of movements in relative price.

- Economic rent. The role of rent, i.e. of income derived from categories of irreproducible capital, also merits closer attention. As real estate grows as a share of wealth, real estate rents grow as a share of income. And across the high-tech high-touch modern economy, it is likely that an increasing share of income will derive from the ownership of brands, intellectual property rights, and market positions which deliver network externality benefits. When land accounted for a large proportion of all wealth in the 18th and early 19th centuries, it was obvious to economists such as David Ricardo that the determination of rental income was an important issue of economic enquiry. It is increasingly again in the modern economy.
- Private credit and money creation, and resulting debt contracts. To a quite striking extent, the role of banks in creating credit, money and purchasing power, was written out of the script of modern macro-economics. The insights of earlier economists such as Knut Wicksell, Friedrich Hayek and Irving Fisher were forgotten or ignored, and the work of Hyman Minsky was marginalised. This “strange amnesia of modern macro-economics” needs to be corrected³¹. And the importance of debt stocks, and the level of private leverage, needs to be recognised as of primary importance.
- Technology, inequality and macro-economics. Many economists have written on the potentially different impacts of different technologies. . Many others have focused specifically on the distribution of income. But that work, at least until very recently, has been only rarely integrated with macroeconomic theory, to identify potential implications for financial system dynamics, stock aggregates, and macro stability.

Cutting across these different areas, there are also two important methodological points. Insights into important dynamics are as likely to be revealed by empirical analysis of long-term historical trends as by abstract mathematical theory: and insights from earlier generations of economists often trigger thoughts relevant to today’s economy. Empirical analysis, economic history, and the history of economic thought have crucial roles to play in enabling us to understand the challenges of the modern economy.

³¹ Turner 2013 considered the intellectual story of this "strange amnesia"

7. Implications for policy

The policies followed before the 2008 crisis failed to prevent it. In its wake major financial reforms have been introduced. These include higher capital and liquidity standards: more effective bank resolution procedures: measures to address risks in derivatives trading: and structural reforms such as ring fencing. For four and a half years I was closely involved in these reforms: I believe we achieved a lot.

But while these reforms are valuable, they will be insufficient to ensure a more stable financial system and economy over the long term. And they cannot, by definition, address the wider social challenges posed by the trends considered in this lecture.

Alongside a reform programme focused on the financial system itself, wider policy changes are therefore essential. These need to focus in particular on:

- Reducing inequality or at least containing its further rise. This is important to financial stability, but also in and of itself. In the face of the technological trends discussed in Section 1, however, it is unlikely that the standard political response - “lets increase people’s skills “- will prove sufficient³². As Brynjolfson and McAfee discuss, more direct redistributive policies such as high minimum wages or guaranteed citizenship incomes may be required.
- Managing the dynamics of a real estate intensive economy. As I suggested in Section 3 and Appendix 1, the fact that much investment in a modern economy is in real estate, and much lending against real estate, is inherent. But we need to recognise and contain the potential for instability which this unleashes. Policies relating to the supply of new real estate, and to its taxation, will likely prove as important to financial and macroeconomic stability as reforms specifically focused on the financial system itself.
- Managing the quantity and mix of credit creation. Different categories of credit perform different economic functions: and a free financial system left to itself will inevitably create “too much of the wrong sort of debt”. This tendency moreover cannot be constrained through the use of the interest rate lever alone.³³ A range of quantitative macro-prudential tools, and greater integration between monetary policy and macro prudential policy is therefore essential. My recent lecture in Frankfurt sets out some of the specific policy levers required. They include establishing capital weights for lending against real estate higher than result from purely private assessments of lending risk; and imposing constraints on borrowers as well as lenders, via for instance maximum loan-to-value or loan-to-income ratios.

³² Increasing skills may be insufficient because of the power of winner take all effects. In many sectors of the economy, high returns accrue to people who have the highest relative skill, whatever the average skill level of the entire workforce.

³³ See Turner 2014 for this argument which rests on the heterogeneity of the elasticity of response of different sectors of the economy to interest rate changes.

8. What about secular stagnation?

Finally what about secular stagnation? Do we actually face it, what is it, and how does it relate to the four trends considered this evening?

I think it is useful to distinguish three separate propositions which people seem to have in mind when they use that term.

- First, the fact that recovery from the 2008 crisis has been so slow and weak. That is clear, and I argue in Appendix 1 and in Turner 2014 that the fundamental reason is the strength of the debt overhang effect. But that in itself does not indicate that we face a secular i.e. truly long term problem.
- Second, a supply-side proposition that we might be facing an inevitable slowdown in attainable productivity growth, which combined with technological drivers of increased inequality, results in some people no longer receiving any increase in prosperity. Robert Gordon has argued that such a slowdown has occurred and will continue to be important. Brynjolfsson and McAfee, as discussed in Section 1, provide compelling arguments for believing that new technology will create greater inequality. And while Brynjolfsson and McAfee's optimism about the capacity of new technologies to transform economic activities may seem at odds with Gordon's pessimism about the average pace of productivity growth, the dichotomy is not as absolute as it seems. It could be that we will face an accelerating pace of automation of all the economic functions that can possibly be automated, but as a result an increasing percentage of employment and economic output taking the form of face-to-face services which inherently cannot be automated. Dramatic technological change could be accompanied not only by increasing inequality but also by a slowdown in the average pace of cross-economy productivity growth, in line with William Baumol's 1967 analysis of the Macro economics of Unbalanced Growth. [Baumol 1967]

But whatever the answer to these issues, they relate to the supply rather than the demand side of the economy, and at least initially "secular stagnation" was a demand-side concept.

- Third, the proposition put forward by Larry Summers at an IMF Economic Forum in November 2013 [Summers 2013] that even before the 2008 crisis we had moved into a world where "natural and equilibrium interest rates have fallen significantly below zero" and where therefore monetary policy is ineffective at achieving full capacity output and employment. He noted that the lower interest rates which resulted produced "too much easy money, too much borrowing, too much wealth", but without pressure on inflation, and without unemployment falling to any really low level. Thus "even a great bubble was not enough to produce any excess in aggregate demand".

What I am proposing is a variant of that third proposition in which

- The collapsing price of “machines” drives reduced business investment demand, and thus reduces the equilibrium interest rate.
- Rising inequality, if it had not been offset by increased borrowing, would have resulted in a reduction in consumption demand.
- The fall in interest rates not only facilitated increased consumption borrowing, but also stimulated real estate booms which in part took a real new construction form (thus offsetting the potential fall in investment aggregate demand), and in part a pure existing asset boom of the sort described in Appendix 3.

As a result, we did not experience in the years before the crisis deficiencies of demand in line with classic Keynesian or Marxist concepts of “secular stagnation. But the adequate demand which we did observe was accompanied by rising levels of private leverage which were bound to lead eventually to crisis, debt overhang and post-crisis recession.

We faced the possibility of “secular stagnation” which we offset through credit intensive growth, and we are now struggling with the consequences.

Appendix 1: The problem with debt

This appendix provides a brief summary of key arguments relating to the economic function and implications of debt contracts which are set out in detail in “Escaping the debt addiction: monetary and macro-prudential policy in the post crisis world”. [Turner 2014]

Exhibit 4 illustrates the relentless growth in private sector leverage as a % of GDP. But before the crisis the dominant orthodoxy believed this was not a problem.

Central banks and modern monetary theory had gravitated to the belief that achieving low and stable inflation was sufficient for financial and macroeconomic stability, and that the details of the financial system and of aggregate real sector balance sheets could be largely ignored. As Olivier Blanchard, chief economist of the IMF, noted in October 2012, we “assumed that we could ignore much of the details of the financial system”. Mervyn King at the same time noted that the dominant New Keynesian model of monetary economics “lacks an account of financial intermediation, so money, credit and banking play no meaningful role”. [King 2012]

Finance theory meanwhile stressed the positive benefits of debt contracts, explaining why “non-state contingent” debt contracts helped make possible capital investment which would not occur if all flows of finance from savers to entrepreneurs had to take an equity form. [Townsend 1979]³⁴ Empirical studies meanwhile appeared to suggest that increasing Bank Credit to GDP was positively correlated with growth. [Levine 2004] The key concern expressed was that in some emerging economies bank credit to GDP ratios might be too low.

Increasingly this benign assessment has been challenged. Moritz Schularick and Alan Taylor find no evidence that the increase in private sector leverage over the half-century before the crisis has been positive for growth. [Schularick and Taylor 2009] Steve Cecchetti, former chief economist at the Bank for International Settlements, has argued that the relationship between private leverage and growth is an inverse U, increasing across some range of values, but falling beyond some level. [Cecchetti and Kharroubi 2012]

These conclusions are compelling. Indeed it is clear that the very feature which makes debt contracts useful – their “non-state contingent” character – also makes them dangerous.

In the upswing of the cycle, debt contracts fool us – we think that they are less risky than they are. As Hyman Minsky and Friedrich Hayek described, debt finance, while crucial to investment, can also drive over investment cycles. [Minsky 1986, Hayek 1929] As Andrei Shleifer et al have described, the very fact that debt contracts usually pay out in full, can lead investors in good times to ignore the downward tail of the distribution of possible results, investing in credit securities which “owed their very existence to neglected risks.”

³⁴ The argument is essentially that with equity contracts there is a problem of “costly state verification”. Investors are unable ahead of an investment to make informed assessments of likely project economics, and unable even after a project is complete to make a full assessment of returns. Potential investors are therefore in a vulnerable position relative to entrepreneur/borrowers: non-state contingent contracts overcome this a symmetry of knowledge

[Gennaioli, Shleifer and Vishny 2010] Much lending to US sub-prime mortgage borrowers, packaged into credit securities and sold to investors, would never have existed but for this effect.

In the downswing of the cycle meanwhile, once confidence has fallen and lenders have become acutely aware of risks, the existence of debt contracts can impose a strongly deflationary impact on the economy. This impact, described by Irving Fisher in his classic Debt- deflation article [Fisher 1933] derives from three effects:

- The rigidities of bankruptcy and default which can produce business interruption and trigger fire sale losses. As Ben Bernanke has observed “in a complete markets world bankruptcy would never be observed” [Bernanke 2004]. In the real world, defaults cause economic disruption.
- The necessity of debt rollover, and thus of new lending supply, which may be impaired if banks suffer losses and if banks/investors suddenly become more risk averse.
- And the “debt overhang” effect, with highly leveraged borrowers (household or company) reducing consumption or investment in an attempt to pay down debt.

The debt overhang effect is particularly important. As Gauti Eggertsson and Paul Krugman have described, it derives from the asymmetry of response between net debtors and net creditors – the former feeling compelled to cut expenditure, the latter under no matching assumption to increase it [Eggertsson and Krugman 2012].

And as Richard Koo described [Koo 2008], it is the best explanation of Japan’s two decades of very low growth and deflation. After the over-exuberant credit and property price boom of the 1980s burst in 1990, Japanese companies felt overleveraged and became determined to pay down debt. This imposed a major deflationary impetus which would have resulted in a real great depression if public deficits had not risen in an offsetting fashion. The result however was that government debt to GDP has risen relentlessly, reaching 230% on a gross basis and 130% net.

Excessive leverage in Japan has not gone away: it has simply shifted from the private to the public sector.

Exactly the same debt overhang effect also explains the slowness and weakness of the post 2008 crisis in the other advanced economies; and exactly the same shift of leverage from private to public sector has occurred in response.

Contrary to the benign assumptions of the pre-crisis orthodoxy, there are therefore strong arguments for believing that:

- Excessive credit growth is a key driver of financial instability and crisis.
- Once crisis occurs, the level of private leverage matters: the higher the level, the deeper and more lasting is the debt overhang effect and the slower and weaker the post crisis recovery.

- Beyond some level too much private sector leverage is dangerous. The pre-crisis orthodoxy was that that bank credit/ GDP was positive for growth. That was valid over a range of values – e.g, 30% was almost certainly better than 10%. But neither theory nor empirical evidence supports the belief that the relationship is linear and limitless.

The growth of leverage shown on Exhibit 4, and the resulting post-crisis debt overhang effect is the most important reason why the 2008 crisis has had such a profoundly harmful effect.

Appendix 2: Real Estate development and lending in the modern economy

Real estate accounts for a large and increasing share of all wealth in most advanced economies: and lending against real estate accounts for the vast majority of all lending. This has consequences for financial stability. These derive in particular from the fact that locationally specific real estate, and the land on which it sits, is in inelastic supply. As a result lending against real estate has great potential to generate self-reinforcing credit and asset price cycles to which inflation targeting central banks do not respond, but which eventually create crisis, post-crisis debt overhang, attempted deleveraging and recession.

But it does not follow that lending against real estate real estate development is in any sense socially useless. Rather our challenge is that

- Real estate is bound to play an increasing role in a modern economy, and its effective development is essential to optimal social welfare.
- But the inherent tendency for economies to become more real estate intensive has inevitable consequences for financial and macroeconomic instability which we need to recognise and manage.

Real estate development is bound to play an increasing role in a modern economy, because of both technological and consumer preference effects.

- Technology “Machines” have been and remain crucial to the productivity growth which drives increasing prosperity. By “machines” we mean all those combinations of hardware and software – factory equipment, transport equipment, information systems etc. – which enable us to automate economic activities which were previously manual or to perform in an automated fashion activities which never previously existed. But many forms of “machine” are collapsing in price as a result of Moore’s law and zero cost software replication. Real estate and infrastructure – building houses, offices, bridges, highways and shopping centres, is not subject to the same cost trend. As a result it increases in relative importance.
- Consumer preference. As people on average get richer, they make choices about how to spend their increasing income. Some categories of expenditure display income elasticity below one: others above one. Among the above one categories are expenditure devoted to competing for the ownership of locationally desirable housing and expenditure on consumer services such as restaurants, or hotels, which require real estate or infrastructure investment. These consumer preference effects give further impetus to the increasing relative importance of real estate within both the capital asset stocks and the investment flows of increasingly rich societies.
- And the quality of housing and commercial real estate development – whether it creates attractive urban spaces, whether it is energy-efficient, whether it has good design values – plays an important role in human welfare in societies where more basic needs, such as adequate food and basic housing, have already been satisfied

Given the importance of real estate, lending against real estate it is bound to account for a large share of all bank and non-bank lending.

Lending to real estate developers plays an important role in financing real estate capital investment. In general, as finance theory has suggested, non-state contingent debt contracts enable mobilisation of savings which would not be possible if all investment had to take an equity form (see Appendix 1). Lending to finance real estate development is a subset of this socially useful “lending to finance capital investment.”

Real estate collateral also is often used to provide security to banks lending to companies who use the funds to finance non-real estate capital investment. Many SMEs, in all sectors, are financed by loans against property.

And residential mortgage markets could play an important role even if they were irrelevant to new capital investment:

- Imagine a society with zero population growth which already possessed a housing stock sufficient to meet consumer preferences for housing services. Gross investment in the housing stock would be equal to depreciation: there would be no new net investment.
- In this society it would be possible to operate without a mortgage market, but only under some highly unrealistic “homogeneity” assumptions. If all people occupy the same position in the income distribution hierarchy as their parents and grandparents: if all chose to spend the same share of income on housing services; if all people died at the same age, and if all families had two children; if houses of the same size and quality commanded equal prices in all regions of the country; and if there were no inheritance taxes, or at least none relevant to people who only owned one house. Then one could imagine an intergenerational transfer of housing assets which worked entirely via inheritance with, for instance, grandparents dying at age 90 leaving equal shares of houses to their grandchildren aged 30.
- But if we have heterogeneity of family size, of age of death, of income relative into inheritance, of consumer preferences for housing services relative to income, or across regions, then a residential mortgage markets can play a crucial role in lubricating the inter-generational transfer and the intra-generational trading of housing assets, and in enabling optimal smoothing of consumption across people’s life cycles.
- And it could play these important and socially useful functions even if the entire mortgage market was completely irrelevant to any new investment in the economy.

Any idea that we should demonise real estate development or real estate lending is therefore absurd.

But it is the very fact that real estate is bound to play a large and increasing role within a modern economy, which makes it essential to recognise and respond to the resulting risks. These risks can arise from excessive lending against existing real estate or from excessive lending to finance new real estate development. In practice the two phenomenon are usually combined and interlinked.

- Lending against existing real estate could generate economic instability even if there were no increase in new construction. It can generate self-reinforcing cycles of the sort shown in Exhibits A and B, which eventually produce crisis, debt overhang effects and deflation. And it can do this even if there is no feed through to higher investment or consumption ahead of the crisis (Appendix 3 set out this possibility). The UK pre-crisis housing credit boom was primarily, but not entirely, a boom in the price of existing housing assets.
- But in the real world, lending against existing real estate often also generates an excessive construction boom, as the rise in the price of existing houses (or commercial real estate) increases the incentive for developers to undertake new construction. This was the pre-crisis pattern in Spain, Ireland and parts of the US. Excess construction booms in turn, exacerbate the deflationary problems created by debt overhang, since in addition the economy has to cope with the challenge of reallocating labour resources from the construction to other sectors of the economy.

As a result, while real estate lending is bound to account for a large proportion of all lending in advanced economies, we need to recognise that free financial systems have a bias to generate more real estate lending that is socially optimal, particularly in the upswing of the cycle but also on average over the long term.

Essentially, lending against real estate generates potential social externality effects which are not captured by private assessments of the riskiness of lending. As a result, public policy must lean against the bias of the system. Turner 2014 discusses policy levers available to do so. They include:

- Setting capital requirements for real estate lending higher than result from private “internal rating based” assessments of risk.
- Using counter cyclical capital requirements aggressively and on a sectoral specific basis (i.e. applied only to real estate lending) to slow real estate credit and asset price booms.
- Imposing borrower as well as lender constraints, for instance via maximum loan-to-value or loan-to-income ratios or via the enforcement of strict underwriting standards which prohibit reliance on expectations of future property price increase.

Appendix 3: Existing real estate, credit demand and the interest rate

Section 4 considers the fall in real interest rates. Logically this must have derived from rise in ex ante desired savings relative to ex-ante desired investment. The hypothesis suggested in section 4 is that falling ex-ante investment demand – driven by a falling price of capital goods – may have been important. Section 4 also argued that the fall in the interest rate may have helped stimulate an increase in borrowing to purchase existing real estate.

But this clearly prompts the question: why did the increasing demand for credit to buy existing real estate not offset the low demand for capital investment, leaving the equilibrium real interest rate unchanged, or at least not as low as it actually was?

I suggest that the answer lies in the fact that credit and money creation, and price increases of existing assets, carry no necessary implications for the balance of ex-ante (or ex-post) savings and investment, and thus no necessary implications for the equilibrium interest rate. This is because:

- As stressed in section 3, banks do not lend out existing money, but create money and credit de novo: bank lending creates its own funding: nobody has to be induced to defer consumption to make such lending possible.
- Lending to purchase existing real estate, and increases in the price of that real estate, do not carry necessary, direct and fully proportional consequences for increased nominal demand whether in an investment or consumption form.
- There is therefore an asymmetry – lower interest rates can stimulate real estate credit and asset price booms, but without that increased lending/borrowing driving any necessary offsetting tendency for the interest rate to rise.

This appendix explains the first two points in more detail.

Bank lending creates its own funding

Suppose that we start with a banking system which has loans of 100, deposits of 89, and equity of 11. It is subject to a 10% capital requirement. Now imagine that either as a result of changed expectations of future property price increases, and/or as a result of a fall in interest rates, there is an increased desire to borrow money to purchase already existing real estate which is in absolute fixed supply

Suppose that 10 more loans are made. This will result in loans of 110, deposits 99 (as the vendors receive money from house sales), and equity of 11. The additional loans granted, interacting with a fixed supply of real estate, produce an increase in property prices. Further growth of loans is now constrained by the equity requirement.

Up to this point, however, there has been an expansion of both credit and deposit money but no increase in savings.

And if some of the holders of deposit money chose to switch that claim against the bank to an equity claim, the process could be repeated ad infinitum.

An increase in bank lending and deposit money does not therefore require anyone to make savings out of income – it does not require a deferral of consumption. It therefore does not necessitate any increase in the interest rate in order to bring forward additional savings.

Nor does it have any direct consequences for either investment or consumption. Its first round effect is simply that there is more credit outstanding, more money balances, and higher prices for existing real estate, but no change in either I or C.

Possible subsequent effects

The increase in the quantity of money, and the increase in the price of real estate, could however have knock-on consequences for investment or consumption and perhaps for interest rates. Thus it is possible that:

- Higher prices for existing real estate may stimulate new real estate construction, financed by yet more lending. Unlike lending to finance the purchase of existing real estate, this would have a direct impact on aggregate nominal demand in the economy. Essentially this is a Tobin's Q effect: the market price of real estate rising above its replacement cost, and thus creating an incentive for investment.
- Higher prices for existing real estate, plus the existence of larger deposit money balances, could stimulate investment in other sectors of the economy as (i) people with increased money balances use these to buy other assets such as equities (ii) this raises the market price of equities in other sectors of the economy above replacement cost (Tobin's $Q > 1$) (iii) an incentive is therefore created new investment. Again if this occurs, aggregate nominal demand will increase.
- Higher household sector wealth, deriving from the increase in property prices, and whether still held in property form or in money balances held by sellers, will stimulate increased consumption.

Through any of these three routes nominal demand could be increased. In turn, if the economy were close to full capacity, this would produce an increase in inflation, to which an inflation targeting central bank would respond by raising interest rates.

But while these effects are possible, there is no reason to assume that they are fully proportional i.e. no reason to believe that knock-on consequences of lending against existing real estate will be equal to the value of lending extended. Part of the increase in lending can produce simply a rise in the balance sheet stocks of credit, money and asset values, which is not accompanied by increasing flows of either investment or consumption.

Lending against existing real estate can thus help explain the phenomenon of rising private sector leverage without any apparent threat to inflation targets.

But while rising private sector leverage of this sort may never result in inflationary pressures, it increases the vulnerability of the economy to financial crisis, debt overhang and post-crisis recession

The essential theoretical point underlying this argument is that:

- Long-term market interest rates reflect the interaction of ex-ante desired savings and investment
- But credit and money creation do not require or necessarily produce any fully proportionate change in either savings or investment.

REFERENCES

- Allen, Robert C.:** *Engels' pause: Technical change, capital accumulation, and inequality in the British industrial revolution*, Explorations in Economic History, 2009
<http://www.nuff.ox.ac.uk/Users/Allen/engelspause.pdf>
- Baumol, William:** *The Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis*, American Economic Review, Vol. 57, No. 3 pages 415-426. June 1967. <http://www.istor.org/stable/1812111>
- Bernanke, Ben:** *The Global Savings Glut and the US Current Account Deficit*, Federal Reserve Board, March 2005.

Non-Monetary Effects of the Financial Crisis, Essays on the Great Depression, Princeton University Press, 2004.
- Bordo, Michael and Christopher Meissner:** *Does inequality lead to a financial crisis?* Journal of International Money and Finance, 31(8), 2147-2161. (2012)
- Brynjolfsson, Erik and Andrew McAfee:** *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*, W. W. Norton & Co, 2014
- Bureau of Labor Statistics:** *Occupational Employment Projections to 2012, Table 3.*
<http://www.bls.gov/emp/home.htm>
- Cecchetti, Stephen and Enisse Kharroubi:** *Reassessing the Impact of Finance on Growth*, BIS Working Paper No 381, July 2012 (<http://www.bis.org/publ/work381.htm>)
- Eccles, Marriner:** *Beckoning frontiers: Public and personal recollections*. Alfred A. Knopf, 1st edition 1951.
- Eggertson, Gauti and Paul Krugman:** *Debt, Deleveraging and the Liquidity Trap: A Fisher-Minsky-Koo Approach*. Princeton University, 2010
http://www.princeton.edu/~pkrugman/debt_deleveraging_ge_pk.pdf
- Fisher, Irving:** *The Debt-Deflation Theory of Great Depressions*, Econometrica, Vol. 1, No. 4, pages 337-357. October, 1933.
- Frank, Robert:** *Luxury Fever: why money fails to satisfy in an era of excess*. Simon and Schuster, 2001.
- Frank, Robert:** *Falling behind: how rising inequality harms the middle class*. University of California Press. 2007.
- Frank, Robert, Adam Levine and Oege Dijk:** *Expenditure cascades*. Social Science Research Network. 2010.
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1690612
- Gordon, Robert** *Is US Economic Growth Over? Faltering Innovation Confronts the Six Headwinds*, NBER Working Paper No. 18315, August 2012
<http://www.nber.org/papers/w18315>
- Graeber, David:** *Debt: The First Five Thousand Years*, Melville House Publishing, New York 2011
- Greenwood, Robin and David Scharfstein:** *The Growth of Modern Finance*, Harvard University / NBER paper, 2012
http://www.people.hbs.edu/dscharfstein/Growth_of_Modern_Finance.pdf
- Hayek, Friedrich:** *Monetary Theory and the Trade Cycle*. First published in 1929; reprinted in *Prices and Production and Other Works*; Ludwig von Mises Institute,

2008.

- Keynes, John Maynard:** *The General Theory of Employment, Interest and Money*, MacMillan Cambridge University Press, 1936.
- King, Mervyn:** *Twenty Years of Inflation Targeting*, Remarks at the London School of Economics, Stamp Memorial Lecture, 2012
www.bankofengland.co.uk/publications/Documents/speeches/2012/speech606.pdf
- Koo, Richard:** *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*, Wiley, 2009.
- Levine, Ross:** *Finance and Growth: Theory and Evidence*. NBER Working Paper No. 10766, 2004 <http://www.nber.org/papers/w10766>
- Maddison, Angus:** *The World Economy: A Millennial Perspective*, OECD Development Centre Studies, 2001
<http://www.oecd.org/dev/developmentcentrestudiestheworldconomyamillennialperspective.htm>
- Mian, Atiff and Amir Sufi:** *House of Debt: How They (and You) Caused the Great Recession and How We Can Prevent it from Happening Again*. Chicago University Press, 2014
- Miles, David:** *Where should long-term interest rates be today: a 300 year view*, 2005, Morgan Stanley Global Economic Forum
- Minsky, Hyman:** *Stabilising an Unstable Economy*, McGraw Hill, 2008. First published by Yale University Press, 1986.
- Piketty, Thomas and Gabriel Zucman:** *Capital is Back: Wealth Income Ratios in Rich Countries 1700 – 2010*, Paris School of Economics, Working Paper, July 2013 <http://piketty.pse.ens.fr/capitalisback>
- Philippon, Thomas, and Ariell Reshef:** *Wages and human capital in the US financial industry: 1909 – 2006*. NBER Working Paper 14644. 2009. <http://www.nber.org/papers/w14644>
- Piketty, Thomas:** *Capital in the Twenty First Century*, Belknap Press, 2014.
- Rajan, Raghuram:** *Fault Lines: How Hidden Fractures Still Threaten the World Economy*. Princeton University Press, 2010.
- Rajan, Raghuram, and Luigi Zingales:** *Saving Capitalism from the Capitalists: Unleashing the Power of Financial Markets to Create Wealth and Spread Opportunity*, Princeton University Press, 2003
- Ranci re, Romain and Michael Kumhof:** *Inequality, Leverage and Crises*, International Monetary Fund, 2010.
<https://www.imf.org/external/pubs/ft/wp/2010/wp10268.pdf>
- Rifkin, Jeremy:** *The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism*, Palgrave MacMillan, April 2014
- Smithers, Andrew:** *The Road to Recovery: How and Why Economic Policy Must Change*, Wiley, 2013
- Summers, Lawrence:** Speech at the IMF Economic Forum, 8 November 2013.
- Taylor, Alan and Moritz Schularick:** *Credit Booms Gone Bust: Monetary Policy, Leverage Cycles and Financial Crises, 1870–2008*, NBER Working Paper No. 15512, November 2009.
<http://www.nber.org/papers/w15512>
- Townsend, Robert M.:** *Optimal Contracts and Competitive Markets with Costly State Verification*, Journal of Economic Theory, vol. 21, pages 265-293 (1979)
- Turner, Adair:** *Escaping the Debt Addiction: Monetary and Macro-prudential Policy in the Post-crisis World*. Remarks at the Center for Financial Studies, Frankfurt, February 2014. <http://ineteconomics.org/blog/institute/adair-turner-escaping-addiction->

- Turner, Adair:** *Credit, Money and Leverage: What Wicksell, Hayek and Fisher Knew and Modern Macro-economics Forgot*. Remarks at Stockholm School of Economics Conference "Towards a Sustainable Financial System", September 2013 <http://ineteconomics.org/blog/institute/adair-turner-credit-money-and-leverage>
- Van Treeck, Till:** *Did inequality cause the US financial crisis?* Hans-Böckler-Stiftung, IMK Working Paper, Nr. 91.(2012)
http://www.boeckler.de/imk_5279.htm?produkt=HBS-005245&chunk=1&jahr
- Wicksell, Knut:** *Interest and Prices*; Macmillan, 1936. First published as *Geldzins and Guiterpreise* (1898)