Building 21st century sustainable infrastructure (part 1): time to invest

Dimitri Zenghelis

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Economics and Policy

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Executive summary

The new UK Government under Prime Minister Theresa May has committed to boosting UK productivity, to addressing the widening wealth gap, and to supporting the transition to low-carbon economic growth. Achieving all this will require the right investments by both the public and private sectors, particularly in sustainable infrastructure, at a time of heightened economic uncertainty. This is the first of two policy briefs that seeks to address this issue by considering whether money is available for such investments, particularly in light of the referendum vote to leave the European Union (EU) on 23 June 2016. An accompanying brief considers institutional reforms to promote long-term investment utilising private capital and to what extent such investments need to be focused on sustainable infrastructure.

Bridging the investment gap to boost growth

The growth of the UK's economy has been sluggish since the financial crisis, even though real interest rates have been historically low. UK productivity levels still lag behind the United States, France, Germany and Italy. Weak productivity growth has meant that even though UK unemployment has remained low since the financial crash, real wages have fallen. A common feature underlying these factors is a shortfall in UK investment.

It is not surprising, then, that the new Government has abandoned its objective to achieve a budget surplus in all years from 2019–20, unless growth drops below 1 per cent, and is signalling further scaling back of the austerity agenda. This is welcome because it enables the Government to support a healthy economy by taking advantage of historically low real interest rates to invest in infrastructure and innovation.

With real interest rates now being negative, investing in infrastructure with a positive social return would have no net cost because public expenditure creates assets. These can be housing, roads, railways, broadband networks, schools, hospitals or power networks, all of which can be set against public debt. There is strong evidence to suggest that returns generated on well-managed, carefully selected public investment projects are likely significantly to exceed their financing costs. As well as boosting economic growth, this offers the Government the opportunity to capture the returns and service its debt (through a mix of direct charges and levies, and higher general tax revenues).

The Organisation for Economic Cooperation and Development (OECD) suggests that an annual investment of 3.5 per cent of GDP into infrastructure is necessary in developed countries to prevent growth being undermined. According to Her Majesty's (HM) Treasury, the UK spent an average £47 billion a year on infrastructure (public and private) between 2010-11 and 2013-14, around 2.75 per cent of annual GDP. The UK regularly scores poorly on international comparisons of its infrastructure. In its Global Competitiveness Report 2015-16, the World Economic Forum ranked the UK to be 24th out of 144 countries for the overall quality of its infrastructure, behind most of its main competitors.

Taking advantage of the savings surplus and rebalancing the UK economy

The reason the real interest rate at which the public sector can borrow is at unprecedented negative levels, is that there is a surplus of global desired saving chasing limited investment opportunities. Investors are left to hunt desperately for positive returns. This fosters mounting macroeconomic imbalances. The current economic environment can be summarised as follows:

- Monetary policy-makers are seeing diminishing returns from reducing the policy interest rate to near zero and are becoming increasingly experimental in seeking to stimulate demand by pouring liquidity into the market.
- In the absence of new opportunities to invest profitably in creating new capital, this surplus liquidity finds itself fuelling price bubbles in existing assets, especially housing. This potentially destabilises the economy, while disproportionately enriching wealthy owners of housing and other financial assets at the expense of poorer members of society who bear the brunt of spending cuts.
- Low interest rates and increased household spending in response to rising wealth, in particular from escalating house prices, have helped to boost consumption and push the household saving ratio towards record lows. After a brief lull following the financial crisis, UK consumers are growing increasingly indebted again.
- Rising borrowing by households and the public sector is reflected in a historically wide current account deficit relative to GDP, as the UK borrows from the rest of the world to pay for rising consumption. This is despite the fact that UK companies have been running financial surpluses by saving rather than investing income.
- As a consequence, investment and productivity growth remain subdued, but consumption and borrowing are increasing. This does not make for a dynamically stable economy.
- The Brexit referendum result has reduced investor confidence, but also lowered the cost of public borrowing as nervous investors seek refuge in government securities the world over.

It is no exaggeration to say that nothing like this has been experienced before in UK economic history. The simplest way to alleviate these tensions, stimulate growth and promote long-term public deficit and debt reduction is for the Government to borrow more to boost productive UK infrastructure spending.

An enhanced infrastructure programme could deliver increased returns to savers; give monetary policy-makers breathing space in seeking new ways to boost demand; reduce the risk of destabilising asset price bubbles; limit net job losses; limit the widening in income inequality and boost growth without stimulating inflation, while at the same time securing fiscal sustainability. Moreover, the effect will be magnified to the extent that the investment generates beneficial multiplier effects, as the International Monetary Fund (IMF), the OECD and others deem likely. The IMF estimates that every £1.00 spent on infrastructure could yield as much as £1.40 in additional output and income. Such an array of potential benefits does not come often and is the result of a historic oversupply of global desired saving over desired investment.

The case for borrowing now despite the budget deficit

The previous Government was worried that ‘unsustainable’ public borrowing might deter investors, but the collapse in UK Government bond yields since the financial crisis tells us that the markets are signalling for more, not less, public investment, with little concern for the risk of debt default or inflation. The market is not signalling that borrowing is unsustainable in the current economic environment.

The current uncertainty following the referendum vote to leave the EU is not an excuse for unlimited accumulation of public debt. So long as fiscal discretion is constrained by public borrowing over the economic cycle for investment only, debt sustainability can be secured. What constitutes the appropriate level of public debt to finance infrastructure ought to be the subject of an extensive public study. This should be carried out as soon as possible by the Office for Budget Responsibility, in collaboration with the National Infrastructure Commission. That one has not been carried out is testimony to the shortcomings of the previous Government's fiscal strategy.

But interest rates are unlikely to remain this accommodative forever. Baby-boomers will start to draw down savings for retirement and confidence in long-run technology-led productivity growth, currently subject to a cyclical bout of pessimism, is likely to recover. At this point, the natural real interest rate might be expected to return towards its historical norm. Some economists estimate that the global economy is already growing above trend and that a global rise in interest rates is imminent. In the meantime, the UK is going to have to invest in a profound transformation in the economy to realign global trade links post-referendum, and also to meet globally agreed decarbonisation targets. Tapping the current glut of free capital would allow the Government to help deliver both these aims and strengthen the sustainability of the public finances.

The impact of Brexit

Regardless of the long term impacts of leaving the EU, the UK economy is set for a bumpy ride in the immediate aftermath of the vote to leave. The structure of the UK economy over the past 40 years has been shaped by access to the single market. Losing that access would require a reconfiguration of the economy and a reallocation of resources, bringing structural dislocation and additional unemployment. Investment in some businesses and sectors would contract, while new sectors would eventually emerge. Even if the UK retains access to the single market, prolonged uncertainty as the UK defines its future relationship with the EU and the rest of the world is likely to drag down investment and could possibly tip the economy into recession. At the same time, real incomes are being squeezed following the sell-off of the pound that followed the referendum result.

One immediate impact of the UK's decision to leave the EU is likely to be a rapid deterioration of the already stretched public finances. The structural, not just the cyclical, fiscal position looks to have deteriorated reflecting the negative impact on long-run trend growth. The UK economy may or may not be fundamentally undermined by Brexit in the long run, but for a good part of the next decade it is likely to be affected by heightened uncertainty, declining inward investment and a reduced flow of skilled workers from abroad, all of which will weaken growth. Yet, the urge to tighten fiscal policy in the face of a deteriorating structural position needs to be resisted if the long run sustainability of the economy and the public finances is to be secured.

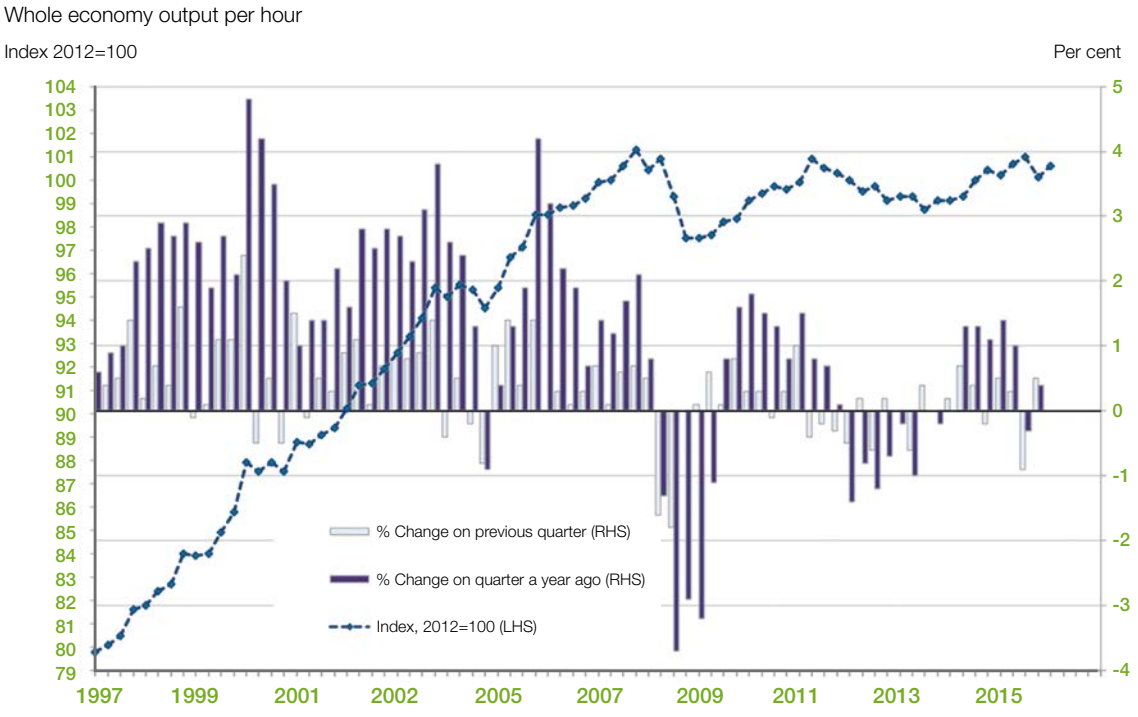
The case for publicly funded infrastructure investment has been strong for some time, but the post referendum economic scenario presents a special opportunity to reduce the investment uncertainty arising from the UK's decision to leave the EU and reduce growing macro-economic imbalances. This policy brief concludes that there is a general macroeconomic case for accelerated infrastructure investment now which will fully pay for itself in the long run. The specific case for sustainable infrastructure and the institutional reforms required to enhance it are the subject of an accompanying policy brief.

1. Pivotal moment for the UK economy

Nearly eight years on from the financial crash and recession of 2008-09, UK investment rates remain historically low, interest rates continue to offer no real returns to savers, and UK labour productivity per hour in first half of 2015 was roughly where it stood at the end of 2007 (Figure 1). By contrast, non-farm labour productivity in the US stands 12 per cent above 2007 levels (US Bureau of Labor Statistics, 2016). UK productivity levels still lag behind the United States, France, Germany and Italy.[1] With investors desperate to generate positive returns for savers, the macroeconomic challenge is clear. This is not lost on the new Government. In her speech to set out her programme in Government, Theresa May committed to addressing 'Britain's longstanding productivity problem'.[2]

Low productivity growth has meant that even though UK unemployment has remained low since the financial crash, real wages have fallen (Figure 2). Over the period 2007-14, UK real wages suffered their largest decline since records began (Low Pay Commission, 2014). A poll for HM Treasury of 21 economic forecasters show average predictions for real pay falling 0.1 per cent in 2017 (HM Treasury, 2016). The decline in the value of sterling following the referendum vote on 23 June to leave the European Union (EU) on 23 June 2016 will further erode real disposable incomes of middle and lower earners for whom imported consumer goods account for a greater proportion of their spending. It has been the flexibility of UK labour contracts in keeping wages down that allowed the headline unemployment numbers to mask the underlying weakness of the

Figure 1. Labour productivity



Source: Office for National Statistics data to 2016 Q1
Note: RHS = right hand side LHS = left hand side

1 See Office for National Statistics comparative data available at: http://www.ons.gov.uk/economy/economicoutputandproductivity/productivitymeasures/bulletins/internationalcomparisonsofproductivityfirstestimates/2015-09-18

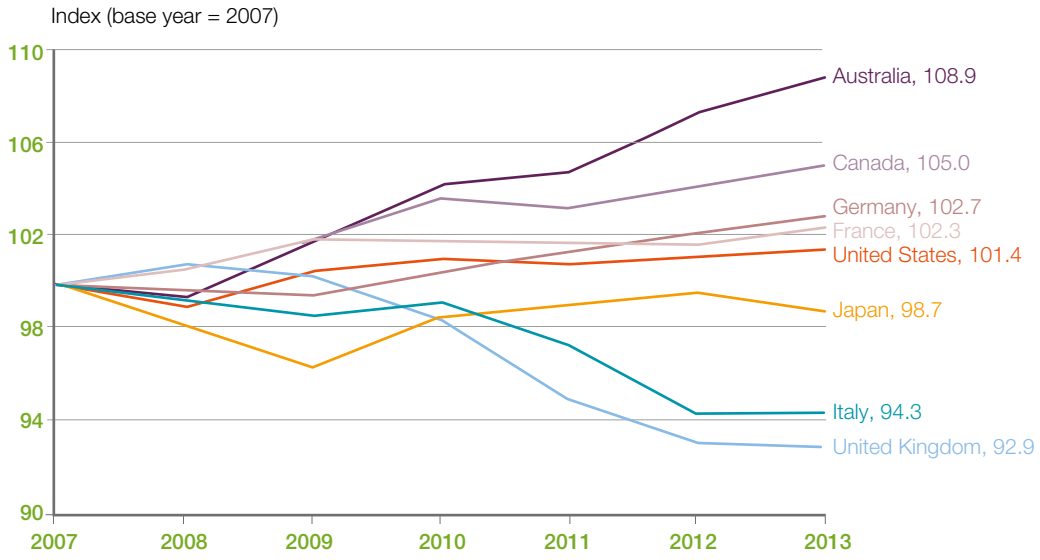
2 Available at: http://www.theresa2016.co.uk/we_can_make_britain_a_country_that_works_for_everyone

labour market, which is better reflected in job insecurity and wages. The vote to leave the EU was arguably a reflection of this sense of insecurity and disenfranchisement. On reaching Downing Street Theresa May set out her vision of 'a country that works for everyone' not just for the 'privileged few'.[3] Addressing insecurity in the labour market will probably form a central plank of that vision.

Economists agree that the UK economy is set for a bumpy ride following the vote to leave the EU, at least in the short term. Regardless of the merits of EU membership, the structure of the UK economy over the last 40 years has been shaped by access to the single market. Losing that access would require a reconfiguration of the economy and a reallocation of resources, bringing structural dislocation and additional unemployment. Investment in some businesses and sectors would contract, while new sectors eventually emerge. Even if the UK retains access to the single market, prolonged uncertainty as the UK defines its future relationship with the EU and the rest of the world is likely to drag down investment and could possibly tip the economy into recession. At the same time, real incomes are being squeezed following the sell-off of the pound that followed the referendum result.

One immediate impact of the UK's decision to leave the EU is likely to be a rapid deterioration of the already stretched public finances. The structural, not just the cyclical, fiscal position looks to have deteriorated reflecting the negative impact of uncertainty on long-run trend growth. The UK economy may or may not be fundamentally undermined by Brexit in the long run, but for a good part of the next decade it will be affected by heightened uncertainty, declining inward investment and a reduced flow of skilled workers from abroad, all of which will weaken growth. The Government has a unique opportunity to step in and bridge the post-Brexit investment gap. The current global economic environment provides an opportunity and rationale for it to borrow at historically low interest rates and invest in infrastructure. Doing so could boost UK productivity and growth, support the decarbonisation of the UK's energy and transport infrastructure, help to rebalance the growth across regions and social classes and address growing macroeconomic imbalances.

Figure 2. Average real wage index for developed G20 countries, 2007–13



Source: International Labour Organization Global Wage Report 2014/15

3 See: https://www.gov.uk/government/speeches/statement-from-the-new-prime-minister-theresa-may

The new Prime Minister, Theresa May, recently set out her economic vision for the UK following the referendum vote[4]:

> 'In the coming weeks, I will set out my plans to take our economy through this period of uncertainty, to get the economy growing strongly across all parts of the country, to deal with Britain's longstanding productivity problem, to create more well-paid jobs, to negotiate the best terms for Britain's departure from the European Union – and to forge a new role for ourselves in the world.'

The desire to rebalance growth across regions and social classes and make the economy work for everyone and not just the 'privileged few' is a mission worthy of support. This is the first of two policy briefs that explore the UK's economic predicament and describe the most promising means to deliver on these and other urgent objectives. Here we examine whether the case for investing in infrastructure still exists. An accompanying brief considers whether such investments need to be focused on sustainable infrastructure.

2. Unhappy returns and stagnant UK productivity

In 2009, at the height of the financial crash, few could have imagined that real interest rates in the UK, United States and EU would stay negative for six years. Yet, at the time of writing (August 2016), benchmark policy rates in the UK, United States, the Euro area, Sweden, Denmark, Switzerland and Japan, accounting for almost a quarter of world output, were set below zero, negative *in nominal terms.* The main central banks (the US Federal Reserve, the Bank of Japan, the Bank of England and the European Central Bank) of the Organisation of Economic Cooperation and Development (OECD) have together added US$5 trillion to their balance sheets. They did this by purchasing government bonds, thereby raising their price and lowering their yield.[5]

Excess desired world saving has chased a shortfall of new investment opportunities, pushing real neutral interest rates towards zero. Global saving (all income that is not consumed) must equal global investment; all income is spent either on current consumption or investment. However, *desired* saving and *desired* investment determine the price (the interest rate) at which saving equals investment. This distinction matters. A surplus of desired saving relative to desired investment is responsible for bidding down interest rates to clear the market. At some level low enough, sufficient savers are discouraged by reduced returns and sufficient investors are encouraged by lower costs of borrowing for desired and actual saving and investment to match. Every pound saved finds an investor, but the interest rate required to bring this about is now historically low.

4 See: http://www.theresa2016.co.uk/we_can_make_britain_a_country_that_works_for_everyone

5 See for example Haldane (2015b).Think of government bonds as an IOU to pay the holder an amount of cash – the coupon – at a certain date. As more people want to buy these bonds their price goes up. The return to holding the bond, that is the annual yield to maturity, corresponds with the difference between the price paid for the bond and the coupon received on maturity divided by the years to maturity. If the price goes up, the yield goes down. If people pay more for the bond than the value of the coupon (accounting for expected inflation) then they would expect to make a loss in real terms – real long term yields are negative.

Andrew Haldane, Chief Economist of the Bank of England, shows that these are the lowest UK real interest rates experienced for at least 5,000 years (Haldane, 2015a). The Bank of England's instantaneous implied real forward interest rates on gilts are an estimate of average interest rates over time periods to come (Table 1). These suggest the return on government bonds will be less than the anticipated rate of inflation, with gilts offering negative real returns of almost 1 per cent for the next 20 years.

Table 1. Unhappy returns: real UK yield curve rates

August 2016					
Date	3 year	5 year	7 year	10 year	20 year
Instantaneous implied real forward curve (gilts)	-2.0	-1.6	-1.4	-1.3	-1.2

Source: Bloomberg and Bank of England calculations
Available at: http://www.bankofengland.co.uk/statistics/pages/yieldcurve/default.aspx

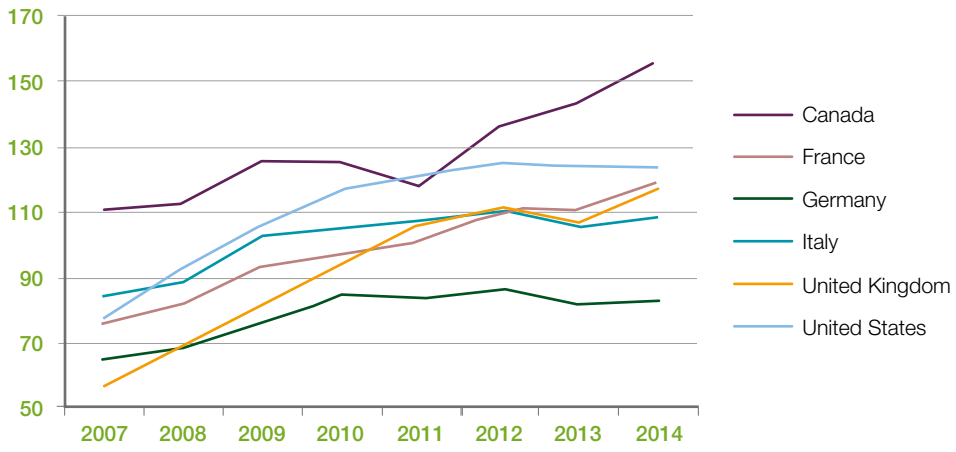
In a world of mobile global finance and capital, UK real interest rates are not determined solely by local conditions. Over the past decade, an excess of global desired saving over desired investment has affected the UK, pushing down local interest rates. Such global linkages explain why similarly low (or lower) rates prevail on safe securities in the United States, Japan and the major economies of Europe. The UK cannot ignore such international headwinds, but it is certainly able to use them to its advantage. In the meantime, institutional investors, such as pension and insurance funds and sovereign wealth funds, are trying to allocate household savings. They have invested massively in securities such as gilts earning negative real returns.

Negative returns on government bonds come in spite of the fact that governments' debt-to-GDP ratios have risen sharply. UK public debt-to-GDP rose from 56 per cent in 2007, prior to the financial crash, to 117 per cent in 2014 (Figure 3). Even the impact of the Brexit referendum vote on the public finances has not diminished the appetite for UK treasury bonds. Again, this trend is not unique to the UK. According to the OECD, over the same period public debt-to-GDP ratios have risen from 77 per cent to 123 per cent in the US, from 64 per cent to 82 per cent in Germany, and from 180 per cent to 240 per cent in Japan.[6] Normally, when public finances look precarious, investors demand higher returns to cover the risk of default or the monetisation of debt though inflation. Yet investors have shown no signs of penalising major governments for apparent lack of fiscal restraint and mounting indebtedness.

There is so much saving that investors seem happy to buy government bonds at rates where *they pay* real returns to the Government for the privilege of borrowing their cash (See Table 1). There is no evidence that fiscal policy is constrained by the need to build or restore confidence in the sustainability of the public finances.

6 These figures are based on 2013 data (the latest available)

Figure 3. General government debt (total) as a per cent of GDP



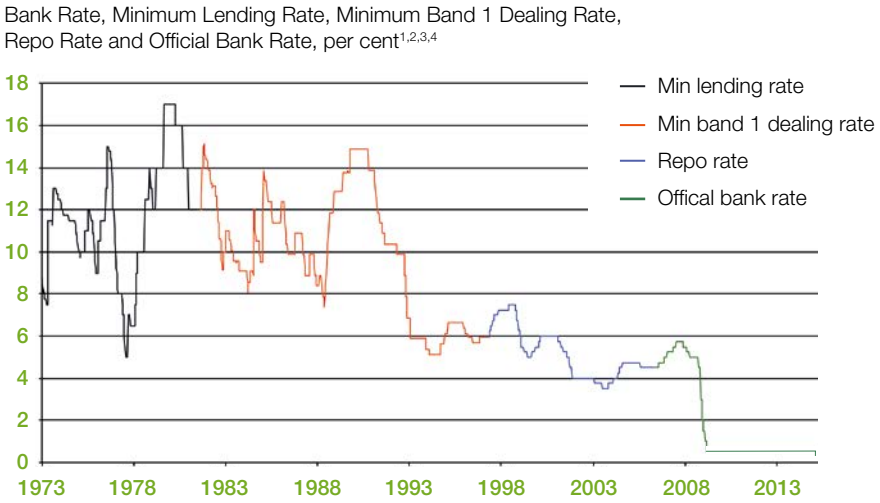
Source: OECD data

3. The UK's monetary policy challenge

The Bank of England set interest rates at a historically low 0.5 per cent from 2009 (cutting them further to 0.25 per cent on 4 August 2016) in a deliberate attempt to stimulate spending and boost demand, but this approach is becoming increasingly ineffective. Prior to this, the interest rate set by the Bank of England had never been below 2 per cent in its more than 300 year history. A glance at figure 4, which shows a time series of various corresponding measures of the policy interest rate set by the monetary authorities, shows how unusual the present circumstances are. With interest rates effectively hitting a zero bound, the Bank of England, like many other central banks, has embarked on a process of quantitative easing whereby it purchases government or other securities from the market in order to lower interest rates and increase the money supply and encourage the banking system to finance more real corporate investment.

Such unorthodox monetary policy is suffering from diminishing returns and rising costs. Andrew Haldane, Chief Economist of the Bank of England, notes that recessions occur more frequently than people might think (perhaps as often as once in every three to six years, based on the UK's long-term history) and he asks 'if a recession were to strike in the period ahead, a relevant question for monetary policy is how much room for manoeuvre might be necessary to cushion its effects?' He calculates that even after interest rates have lifted from their historically low rate, it is more likely than not that they will return there over a 10-year time horizon. This would 'give insufficient room above the effective lower bound to accommodate a typical loosening cycle' (Haldane, 2015a).

Figure 4. Monetary policy: floored



Source: Bank of England, 2016 http://www.bankofengland.co.uk/statistics/Documents/rates/baserate.xls

Notes: 1 – Bank Rate, Minimum Lending Rate, Repo Rate and Official Bank Rate are interest rates. The Minimum Band 1 Dealing Rate are discount rates.
2 – Data refer to the minimum published rate the Bank discounted bills to relieve money market shortages (excludes late assistance and repurchase and sale agreements).
3 – 16.9.92, UK leaves the European Exchange Rate Mechanism. MLR set at 12 per cent, raised to 15 per cent (with effect from 17.9.92; never implemented).
4 – The official bank rate paid on commercial bank reserves.

Some economists are concerned that these unorthodox measures smack of panic with associated uncertainty undermining private spending.[7] Banks are unable to pass the costs of low rates onto depositors who may opt to store money 'under the mattress', thus eroding bank profits and raising the risks of a run on deposits. In July 2016, NatWest warned that it may start charging business customers to deposit cash if interests rate go below zero (Collinson, 2016). Catherine Mann, Chief Economist of the OECD, has argued that the world is 'overloaded on monetary policy' (Chan, 2016). Others focus on the unintended consequences of policy entering unchartered waters often with unexpected outcomes.[8]

7 Some have argued that negative real interest rates force people to divert more consumption into saving in order to meet saving and pensions targets, thus exacerbating weak demand. Wolfgang Schauble, Germany's finance minister, has criticised the policies of the European Central Bank and identified negative real interest rates as a source of popular discontent and economic weakness (see Wagstyl and Jones, 2016). Whilst it is true that for savers the 'income effect' associated with the need to save more to meet saving targets offsets the 'substitution effect', whereby low rates provide an incentive to bring forward future spending, the same is not true for borrowers. For borrowers, both the income and substitution effects work in the same direction. Low interest rates provide an incentive to bring forward future consumption and also make the payment of debt easier, so boosting income available to consumption now and in the future. The net effect of low interest rates on consumption and demand is therefore likely to be positive, especially as UK households are net borrowers, with mortgage and consumer debt liabilities exceeding household savings with banks and building societies (see ONS UK National Accounts).

8 This was picked up by Andrew Smithers in a column for the Financial Times, who argued that low interest rates have prompted companies to borrow money to buy back shares, rather than to invest, in order to increase the value of the associated corporate option compensation schemes http://blogs.ft.com/andrew-smithers/2014/11/buybacks-and-the-parallel-universe-of-investment-bankers/

4. A growing asset price bubble

In the absence of alternative sources of returns from new investments, saving has tended to flow into existing assets, raising risks of bubbles (e.g. in property). More than 70 per cent of bank lending is towards pre-existing residential and commercial real estate and this finances a competition for a scarce, location-specific supply of urban land (i.e. London property) (Turner, 2014). In short, banks are not lending for productive investment but are extending credit for existing collateral. This is dangerous. Like all bubbles, a dent in confidence on the sustainability of long-run returns, such as that provided by the UK's vote to leave the EU, could easily prompt a sharp downward spiral in house prices and a sharp retrenchment in consumer spending of the kind that the Bank of England is worried about. This process was recognised as far back as 2005 when Ben Bernanke, as Governor of the United States Federal Reserve Board, outlined the impact that the saving glut was having on housing (Bernanke, 2005):

> 'During the past few years, the key asset-price effects of the global saving glut appear to have occurred in the market for residential investment, as low mortgage rates have supported record levels of home construction and strong gains in housing prices.'

As Gavin Davies (2013) noted, "central banks across the developed world have created asset price bubbles…since this has been the only means available to boost demand." The Bank for International Settlements in its Annual Report (2015) argues that low interest rates not only increase volatility, but also reduce growth: "Rather than just reflecting the current weakness, low rates may in part have contributed to it by fuelling costly financial booms and busts. The result is too much debt, too little growth and excessively low interest rates. In short, low rates beget lower rates." Consumer price inflation, which has historically been among the earliest signals that monetary policy is excessively loose, may emerge with a longer lag. This is because prices of existing assets soak up the additional demand, much as they did prior to the crash of 2008 which was unique among prolonged UK post-war recessions in not being preceded by significant consumer price inflation.[9] The Bank of International Settlements warns (ibid):

> 'the behaviour of inflation may not be a fully reliable guide to sustainable (or potential) output. This is because financial imbalances often build up when inflation is low and stable, declining or even negative. The hallmarks of these imbalances are booming credit and asset prices, particularly property prices, and signs of aggressive risk-taking in financial markets, such as low credit spreads and falling volatility.'

Inflation, in the form of rapidly rising consumer prices, may be absent but investors' search for yield has pushed up asset prices in the UK and across the OECD. Bonds, equities and house prices have risen towards record levels.[10] While those hardest hit by fiscal austerity are the poorest in society, who rely directly on public expenditure, the beneficiaries of rising asset prices from easy money are disproportionately those at the top of the income ladder, widening the gap between rich and poor.

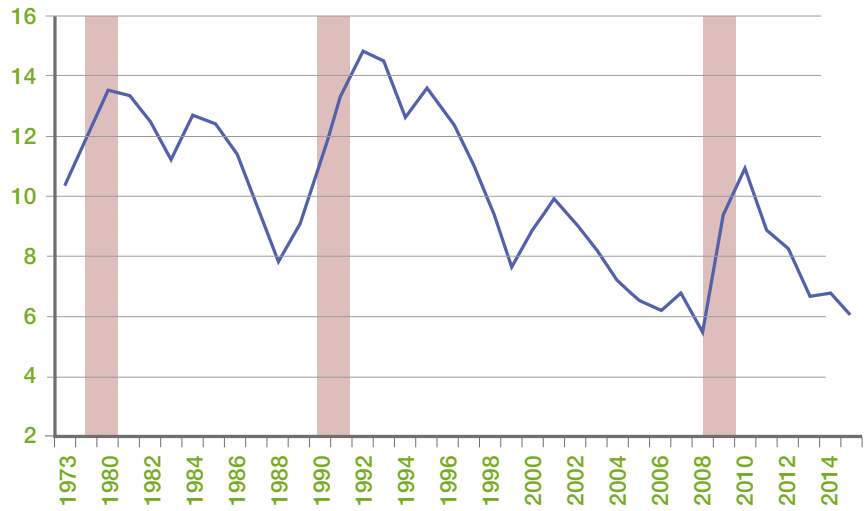
Low interest rates together with the desire to spend by borrowing against rising wealth (wealth effects), particularly in housing, have encouraged UK consumers to spend almost all their earnings and has pushed the UK household saving ratio to historic lows, lower even than in the

9 UK consumer price inflation peaked at a relatively modest 5.2 per cent in September 2008. By comparison, the recessions of 1974, 1980-81 and 1990 were all preceded by double-digit peaks in inflation and a corresponding sharp tightening of monetary policy. See: https://www.ons.gov.uk/economy/inflationandpriceindices/timeseries/czbh

10 At the time of writing (August 2016) the FTSE 100 stands at an 11-month high of 6700, close to its all-time high of just over 7000 while the US S&P 500 stock index hit its first all-time high in 14 months.

consumer binge that preceded the financial crash (Figure 5). After rising sharply in 2009, as is customary during a recession, by 2015 the saving ratio had fallen back to 6.1 per cent of GDP. The recovery has barely got under way and, despite record global saving, already UK households are becoming weighed down by debt.

Figure 5. UK households saving ratio as a per cent total disposable income (annual)



Note: Shaded areas indicate UK recession

Source: Office for National Statistics, data to 2015; includes Non-profit Institutions Serving Households

5. Why do we have a glut of desired saving over desired investment?

The global economy has been subsumed by an historic rise in the propensity to save and a decreasing propensity to invest.[11] Several explanations have been proffered for this global trend, many mutually supportive and each putting the emphasis on different inter-related elements of the same story.[12] They can be summarised as follows:

- **Deleveraging.** Part of the explanation lies in global deleveraging as financial institutions, firms, households and governments simultaneously try to restore net worth by cutting spending and borrowing.[13] This has the collective effect of depressing the economy and undermining net worth in a process termed the paradox of thrift, which was popularised by Keynes.[14] This corresponded with the tightening of financial conditions and credit availability after the crash in 2008, which limited household consumption growth.

11 As an accounting identity, global saving must equal global investment 'ex-post'. The term desired net saving refers to an 'ex-ante' excess of net saving (or deficiency of net investment) requiring a fall in the rate of return to capital to extremely low levels in order for this identity to hold.

12 See Lukasz and Smith (2015)\for one of the clearest summaries.

13 See Reinhart and Rogoff, 2011.

14 See Keynes 1936, Krugman, 2015 and also Zenghelis 2011a for a post-2008 UK application.

- **Inequality.** Another explanation for greater global saving is the increase in inequality and a rising share of income going to the wealthy, who have a higher propensity to save their income than the poor. Rising income and wealth inequality has been a feature of most developed and many emerging economies since the 1980s. The top quantile of the global income distribution has seen their share of global income rise by around 7 percentage points over the past 30 years (Piketty, 2014).

- **Demographics.** Others point to increased uncertainty about life expectancy, pension returns and the length of retirement. In the rich world, baby-boomers will soon be the prime saving age cohort, when earnings are at their highest and retirement is looming. Lukasz and Smith (2015) estimate that expectations of lower global trend growth could account for around 100 basis points of the decline in global real rates of interest seen since the crisis.

- **Reserves accumulation.** Developing countries have been building international reserves in order to keep exchange rates competitive and provide support in the event of rapid financial outflows (IMF, 2012).

- **Technology.** The availability of cheaper capital may be another factor which pushes down investment in nominal terms, but, to the extent that cheaper capital is available, there has not been the increase in the quantity of investment that might have been expected in order to push interest rates up again. Since the 1980s, the price of capital has fallen by 30 per cent (Eichengreen, 2015).

- **Productivity.** The returns to the 'new economy' resulting from the proliferation of information technology are seen as lower than previously expected, reducing the returns to investment (as discussed below).

- **Corporate confidence and short-termism.** A final factor is company sector saving which has been historically high. The unwillingness to plough profits back into investment has been reflected in the jump in share buy-backs. These offer an indication of low confidence in companies' own assessment of the returns to investing their own capital. They may also signify a growing unwillingness to sacrifice near-term dividends for future returns. Neither explanation signifies confidence in the future.

Many of these explanations have been deployed to explain why neutral real interest rates have fallen substantially in what has been dubbed 'secular stagnation'. A recent study by the Bank of England concludes that a mix of these factors have lowered the global neutral real interest rate by about 4.5 percentage points over the past 30 years (Lukasz and Smith, 2015).

Some natural rebalancing cannot be ruled out as elements of the global economy begin to reduce the current excess of desired net saving. The recent falls in the prices of oil and other resources are likely to reduce the surplus of saving from resource rents in the hands of a few rich resource owners (who tend to consume less out of earnings than most others).[15]

Furthermore, the assumption of a permanent reduction in global trend productivity is contestable. Underlying productivity growth cannot be observed or measured in the data; it can only be inferred. Predicting the future is even harder. Just as expectations of the impact of the new economy were subsequently deemed to have been overstated prior to 2008, it is not unreasonable to expect some of the subsequent gloom to be exaggerated. There is currently a vibrant debate over the question of whether global trend productivity growth has fallen. This is crucial in determining the full potential returns to investment and, correspondingly, whether

15 Oil prices have fallen from close to $125 a barrel of Brent Crude in 2012 to settle mostly in the range $40-$55 in the middle of 2016.

interest rates can be expected to stay low over the long term. If pessimists are proved wrong and future productivity growth turns out to be higher than expected, investor appetite will return and interest rates will rise.

Robert Gordon (2015) argues that the rate of technical progress has slowed after peaking last century. The revolution in information and communications technology (ICT), he argues, is less important to driving economic growth than the five great inventions of the period between 1870 and 1970: electricity, plumbing and urban sanitation (for example flush toilets), chemicals and pharmaceuticals, the internal combustion engine and modern communication. Whereas transport mobility and consumer durables changed unrecognisably between 1920 and 1970, in the 50 years that followed, we still travel on jet planes of similar speed and capacity and have mostly the same domestic appliances in our kitchens.

However, not everyone is sold on the productivity-slowdown story. Tyler Cowen (2016) suggests further that with greater political and economic freedom all over the world, more individual geniuses have the potential to contribute to global innovation than ever before. Advances in the treatment of mental health could have similar effects (Layard, 2013). Others argue that the 'third industrial revolution' is entering a transformative and disruptive phase. Brynjolfsson and McAfee (2014) argue that computers have started to make inroads in some unexpected areas, such as self-driving cars, taking advantage of a host of technologies from processing power, to motion sensor technologies to global positioning systems (GPS).[16] Information technology and digital communication, they argue, are now just reaching an inflection point that speeds up also the ease with which these new capabilities and new ideas can be combined and recombined. The smartphone is an example of synergistic amalgamation of innovations, including the touchscreen, voice recognition, GPS, motion sensors, faster and more compact computing, random-access memory, mobile telephony and the internet.

It is the combined possibility of many of these breakthroughs brought together by networked ICT that offers the potential to boost productivity (See Combes *et al.,* 2016). These authors note that the acceleration in computer speeds since the 1970s has continued apace, with the likes of Gordon underestimating the impact social media makes to people's lives. No one can predict technological breakthroughs with accuracy, but the impact of artificial intelligence, genetic engineering, the use of smart mobile connected technology (Zenghelis, 2011b) and smart software could revolutionise productivity.

In practice, the underlying drivers of global factor productivity have not changed significantly since 2008, even if perceptions have, and some restoration of confidence in future growth cannot be ruled out. On the other hand, the risks of an investment downturn in China following the bursting of the financial bubble there could exacerbate problems (China has a reported national saving ratio not far short of 50 per cent of GDP) unless consumption increases to absorb surplus global saving.

Attempting to predict the duration of the current saving glut is a matter of speculation. Yet, left to its own devices, there is another self-correcting mechanism in the economy that should serve to raise nominal interest rates, but it is not an encouraging one. Years of under-investment might be expected to curtail productivity growth and cause supply side constraints which would finally raise inflation and erode the value of nominal debt (see Reifschneider *et al.,* 2015). But waiting for a structurally weak economy to act as transmission mechanism to restore financial balances is hardly an aim worth aspiring to. Thankfully we should be able to do better.

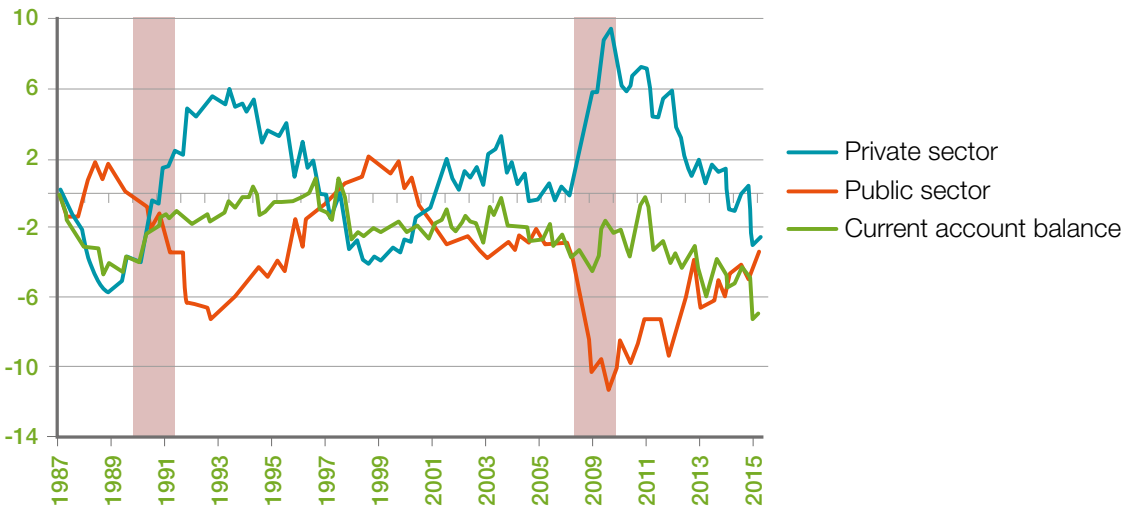
16 By way of illustration they use the parable of the second half of the Chessboard to explain the potential impact of exponential growth derived from Moore's Law.

In the longer term, another drag on global saving is likely to be the running down of natural capital. Helm (2015) argues that much surplus saving from countries like China stems from extensive depletion of natural resources and the environment. It is a reflection of the failure to maintain natural assets in countries like China (where many of the greatest rivers are dead, seas increasingly polluted and agricultural land destroyed) and those that export raw materials to these countries. In the long run, these factors are likely to weaken growth and prosperity and stem the flow of surplus saving.

6. The UK is not saving; the UK is not investing

When assessing the potential role for fiscal policy to stabilise the economy, it is always instructive to look at the net borrowing positions of different parts of the economy. Figure 6 shows net lending (the balance between investment and saving or, equivalently, income and expenditure) split by private and public sector. The sum of these account for all UK net borrowing reflected in the current account balance. This simply states that any national shortfall in investment over saving (or income over spending) is made up for by net borrowing from abroad.[17]

Figure 6. Sector financial balances (net lending) as a per cent of GDP



Note: Shaded areas indicate UK recession

Source: Office for National Statistics, data to 2016 Q1

17 Any (relatively small) statistical errors are captured in the 'balancing item' which ensures that the current and capital accounts sum to zero.

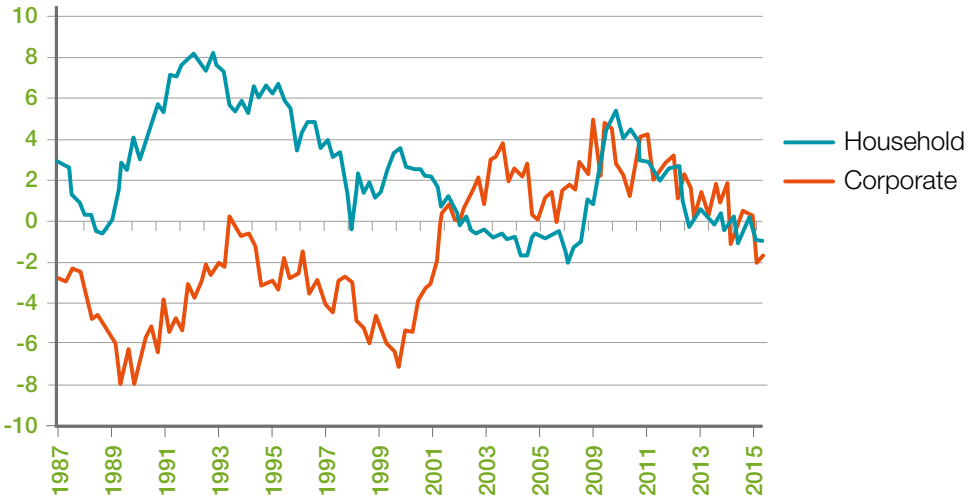
The symmetry between the private and public sector positions is immediately obvious and is no coincidence; it reflects the mutual causal links between net borrowing in the two sectors. The trends in Figure 6 are 'ex-post' and do not show underlying causality. However, the evidence from interest rates gives a clue as to what happened. In normal circumstances within a healthy global economy, a decision by the UK Government to borrow more would, all else being equal, raise interest rates. This would result directly from going to the market to raise capital. It could also result indirectly through a tightening of monetary policy to offset the impact on demand and inflation of a growing excess of government spending over revenues. Higher interest rates would boost private net saving as a result of higher income. Over the longer term, rational individuals might also build up savings in anticipation of higher future tax demands to fund increased public sector debt. All three effects would manifest in a rise in public borrowing mirrored by an offsetting rise in private saving.

By contrast, a recession is usually marked by a slowdown in private borrowing to invest and a rise in precautionary saving. This puts downward pressure in interest rates to balance investment and saving, while monetary policy is eased in response to weaker output. The reduction in private spending hits tax revenues relative to welfare pay-outs, resulting in a corresponding mirror-image deterioration on the public finances. The recession between 1990 and 1991 revealed this effect clearly and the same was seen after the financial crash of 2008. It was the collapse in private sector net borrowing which recently boosted public sector deficits via diminished net tax revenues. Figure 6 shows that the UK private sector generated a record post-war surplus of £113 billion in 2009 – around 8 per cent of GDP – though this surplus mostly disappeared by 2015.

The financial crash of 2008 prompted a sharp retrenchment in lending to households, which pushed the private sector back into surplus. But private surpluses have come down since as UK household spending picked up. Indeed, since 2013, households have been spending more than they earn (Figure 7 breaks down private financial balances into households and companies) and, with the Government borrowing too, this finance must come from somewhere; and it comes from abroad. The UK current account deficit widened to 7.3 per cent of GDP in the fourth quarter of 2015, the largest quarterly deficit since records began in 1955.

But what have firms been doing since the crash of 2008? Additional borrowing from abroad to invest in UK plc would be no reason for alarm. But, the extra borrowing from abroad has not, in general, been used to fund company investment, but instead has mostly gone to fund households and public current consumption. Put simply, it is the UK and not the UK public sector, which is living beyond its means. As well as mounting net debt, which will need repaying to international savers in the future, this puts the UK at mounting risk of a sudden retrenchment of inflows if sentiment shifts. The consequences of the referendum vote have put the UK in just such a position of risk, which explains the sell-off of sterling. Though the latter will cushion the blow to the economy, it will not entirely offset the impact of lower investment and a protracted reduction in growth.

Figure 7. Sector financial balances (net lending) as a per cent of GDP



Source: Office for National Statistics, data to 2016 Q1

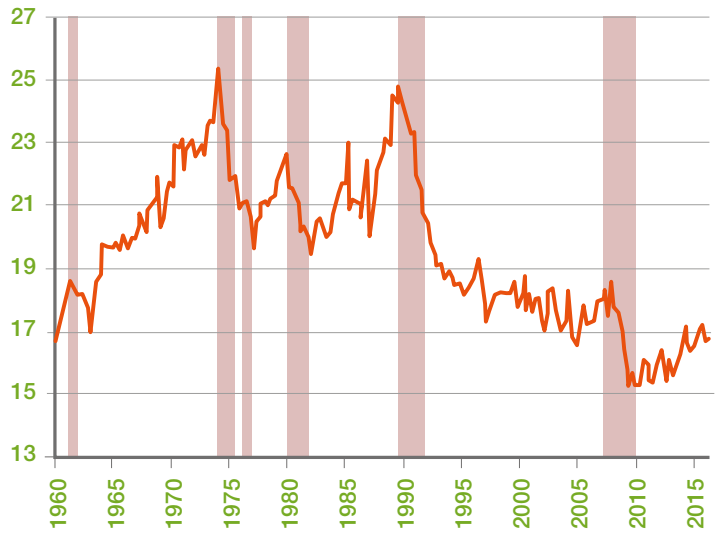
7. The UK is borrowing to consume

The picture that emerges from UK financial balances should cause the new Government deep anxiety. In a healthy and dynamically balanced economy, households should run a financial surplus. The average household saves some income into bank accounts, pension funds and insurance companies, which recycle the money to invest in private businesses. The business sector, by contrast, will tend to run a financial deficit as it borrows from households via the same financial intermediaries. In this way, UK households help fund companies' investment. The returns from these investments are then paid back to households in the form of interest, profits and dividends, fuelling investment funds and pensions drawn down on retirement. This generates a dynamically expanding economy where both demand and supply are able to grow as capital is invested.

But since around 2003, this sustainable dynamic flow has mostly been reversed, with companies starting to save some of their profits (which have held up well) rather than invest in capital, so generating financial surpluses. Together with foreign saving, this surplus has been used to finance household consumption and public sector net borrowing.

This corresponds with a period over which UK investment, the key underlying driver of per-capita growth in the economy, has entered a prolonged slump (Figure 8). Total UK investment fluctuated more-or-less around 20 per cent of GDP in the four decades preceding 2000. Since then, it has plunged to an average of less than 17 per cent for the bulk of the last decade. This has occurred despite the unprecedented persistence of near-zero real interest rates.

Figure 8. UK investment (gross fixed capital formation) as a per cent of GDP



Note: Shaded areas indicate UK recession

Source: Office for National Statistics, data to 2016 Q1

Most of the decline has been accounted for by falling business investment, which forms the bulk of the total. But more recently, government investment has also started to fall as the Government has set its sights on reducing the public deficit. Public net investment, which was 3.4 per cent of GDP in financial year 2009-10, fell to 1.8 per cent of GDP in 2015-16, and, according to Office of Budgetary Responsibility, is projected to stay below 2 per cent of GDP each year until 2020-21.[18] Lacklustre investment is part of a global trend, which the IMF (2015) mainly puts down to being a response to persistent economic weakness. However, the UK appears to have fared particularly badly, even before the referendum on membership of the EU. Government investment as a per cent of GDP is the 7th lowest of the 26 countries tracked by Eurostat.[19] This raises concern that the desire of HM Treasury to meet short-term political commitments has displaced long-term investment and macroeconomic stability, which forms the subject of discussion in an accompanying policy brief (Zenghelis, 2016).

The tendency for firms to save is not unique to the UK (see Wolf, 2015). Between 2004 and 2013, Fortune 500 companies bought back a remarkable US$3.4 trillion-worth of shares. In 2014, these companies returned US$885 billion to shareholders, more than their total net income of US$847 billion (Lazonick, 2014). Some explanations are reassuring, for example, that some of the fall in current price investment simply reflects the falling price of ICT equipment which means companies can purchase the same capital for less (Eichengreen, 2015). Lukasz and Smith (2015) estimate that the fall in the price of capital since 1980 may be responsible for a decline in investment's share of GDP by up to 1 percentage point. But this only explains some of the weakness in investment. Most of the decline appears to be the result of a contraction in volume, rather than in value or price.

18 This is gross investment, net of depreciation suggesting the UK is able to do little more than repair and replace the existing, aging capital stock. See 'Public Finances Databank': http://budgetresponsibility.org.uk/data/

19 Eurostat data, available at: http://ec.europa.eu/eurostat/web/products-datasets/-/teina210

Some argue that the reduction in investment reflects savings from the virtualisation of the economy as a result of the internet.[20] Investment in physical video rental stores and music stores and associated distribution centres are no longer required in the age of streaming and digitisation, private cars replace taxi fleets, and online rentals of rooms in private homes reduce business opportunities form building hotels. However, this only explains some of the shortfall in investment. A less heartening explanation for the corporate saving glut stems from pessimism over future demand, driven by the demographics of an aging population (Lukasz and Smith, 2015). Either way, the concern is that the global trend in productivity and output growth has fallen (a trend that is particularly acute in the UK).[21]

The degree of spare capacity (or output gaps) in the economy is diminishing. This is partly because growth is recovering but also, arguably, because capacity (or trend) growth has been squeezed by the past slowdown in UK investment. Trend growth is unobservable, but is widely seen as falling, in line with the UK's diminishing expected productivity growth.[22] Economists are familiar with Say's Law, the proposition that supply creates its own demand. But in recent years the evidence tells us that we have experienced the reverse, whereby a lack of demand creates its own lack of supply. Excess saving acts as a drag on demand while deficient investment acts as a drag on productivity growth and supply.[23] Too much saving is chasing too little investment; this is what bids down interest rates.

8. The growing need for a fiscal fix

The limitations of monetary policy have shifted the focus of policy on to the fiscal side, and for good reason. Under the standard macroeconomic orthodoxy that has prevailed over the past three decades, interest rates were the main instrument of macroeconomic stabilisation and fiscal policy was relegated to a secondary role in managing demand. This is because the time lags associated with the impacts of a mix of fiscal instruments were deemed too long and variable and prone to being offset by the private behaviour.[24]

Looser monetary policy might be complemented by an attempt to alter expectations by raising the inflation target or adopting a nominal GDP target. But a more balanced and traditional solution exists. Borrowing to invest imparts active intervention in financial markets to absorb current saving without pumping more liquidity into the system. By providing a direct injection of demand, coordinated public borrowing can allow monetary policy to tighten and natural rates to begin to rise.

20 Summers (2014) refers to this as the 'WhatsApp' effect.

21 Christine Lagarde, Managing Director of the IMF, previously said the world was at risk of falling into a 'new mediocre' for global growth. See IMF's April 2015 World Economic Outlook.

22 A recent survey of leading economists by the 'Financial Times' examined the issue of UK trend growth about which there was a widespread concern. See Giles and Cadman, 2015.

23 The causality can work both ways, with low productivity and output growth attenuating firms' demand for investment, an application of the so-called 'accelerator principle'.

24 Private agents would, for example, save more to offset additional government borrowing in expectation of higher future tax rises to plug the hole in the public finances and/or as a result of higher interest rates brought on directly (or indirectly through monetary tightening) as a result of the additional public borrowing. In a process dubbed 'Ricardian Equivalence' consumers will respond to a tax cut by saving the full amount, and not spending any of it. See also Barro (1974). The empirical evidence for such equivalence holding is mixed, though it is more likely to hold at times when economic output is close to capacity in situations where additional demand would not be expected to deliver increased output.

Yet there is enhanced scope for supportive fiscal policy in the UK, even once the impact of the referendum vote on Brexit is considered. By bidding bond prices so high and yields so low, markets are sending a clear signal that risks of default or debt deflation are less of a concern than the search for higher yields. In such an environment, an expansionary fiscal policy can reduce net national saving, raise neutral real interest rates and stimulate growth, providing a focus on investment. The question is what to invest the borrowed money in? This matters, from the perspectives of both macroeconomic management and fiscal responsibility, a subject which forms the focus of the accompanying policy brief.

Many inside and outside the UK Government understand this logic, whether or not they pushed for the UK to leave the EU. For example, Gerard Lyons, the leading Brexit economist and former advisor to Boris Johnson, argues that markets would not penalise a rise in borrowing to fund investment. Higher infrastructure spending, he feels, would be justified against the backdrop of very low interest rates. It will produce stronger economic growth and the stronger growth in itself will help the future public finances: 'It's like an individual, if an individual goes out and borrows on the credit card, that's bad, if an individual goes out and borrows for their mortgage that's good.'[25]

The accumulation of public debt has its limits and the case for more public debt to finance infrastructure must be subject to independent public scrutiny assessing the value of each investment opportunity. The Government must work with the Office of Budget Responsibility to develop new fiscal rules that prevent borrowing over the economic cycle, except to invest, such that the current budget is balanced over the cycle (with current deficits in slowdowns matched by current surpluses in the good years).

Because global desired net saving is the underlying cause of the UK's predicament, UK fiscal policy would be more effective if it formed part of a coordinated global expansion in borrowing to fund investment. This issue is likely to be top of the agenda at the G20 leaders' summit in September 2016 in the city of Hangzhou, China. However, to the extent that the rest of the world is slow in acting, the UK can still move on its own. It can take full advantage of our competitors' hesitation by cost-effectively boosting UK infrastructural capacity at very favourable (for borrowers at least) rates of interest, taking full advantage of the surplus of cheap global saving. In this case, UK fiscal policy must be coordinated with monetary policy in order to avoid an unsustainable widening of the already worrying UK current account deficit.[26] Indeed, some argue that the era of fully autonomous monetary policy, where monetary policy-makers merely adjust interest rates to keep output close to its non-inflationary trend – the orthodoxy of the past few decades – is over (Summers, 2016).

Periods of high unemployment and or under-utilisation of capital can constrain growth in the economy's productive capacity, often termed as the 'hysteresis' effect. This can interact negatively with low confidence such that a lack of investment, in the expectation of weak growth, becomes a self-fulfilling prophecy. This is a real and present danger in the UK.

25 See: http://www.bbc.co.uk/news/business-36682368

26 A large current account deficit is not a problem per se if the foreign inflows are used to fund profitable investment, as would be the case here. Nevertheless, because the extra demand generated by the Government's fiscal injection will (all else being equal) reduce the need for unorthodox monetary policy and allow monetary conditions to tighten relatively, this will attract foreign financial inflows and worsen the current account deficit. Additional policies may be required to promote domestic saving and shift UK spending from consumption to investment.

Consequently, the case for fiscal activism continues to gain wide support. In its 2016 Global Interim Economic Outlook, the OECD (2016) called for collective fiscal action to raise growth and reduce financial risks. It noted that boosting public investment will raise not only long-term productivity, but by boosting demand, it will also have an immediate effect on growth which should reduce the public sector debt to GDP ratio. The OECD NiGEM model shows that a public investment stimulus equal to half a per cent of GDP by all OECD countries would boost GDP by around 0.6 per cent in the UK, United States and Euro area, and reduce the public debt stock by 0.2 to 0.7 per cent of GDP within a year of implementation. Correspondingly, the Institute for Fiscal Studies noted in its Green Budget (IFS, 2016) that 'running a surplus is not necessary to bring down debt as a share of national income'. The OECD model indicates it may deliver the opposite result even in the near term. There is still no shortage either of private capital available for investment or of investment opportunities with potential for profitable returns. Britain's major airports, railways and roads, as well as its schools and hospitals, are not suffering from excess capacity.

Many economists have argued that circumstances such as the present can amplify the degree to which a fiscal expansion constitutes a win-win proposition through higher so-called multiplier effects. Ball *et al.* (2014) used the United States Federal Reserve model to find that a temporary increase in fiscal stimulus would not only boost growth but would also reduce, rather than increase, the long-run debt-to-GDP ratio in the United States. Blanchard and Leigh (2013) have also shown that fiscal multipliers in advanced economies were larger than expected during 2009 and 2010, with the result that output fell short of IMF forecasts in countries that pursued fiscal austerity. The IMF (2015) estimates that in periods of slack demand, such as the present, the long-term multiplier from well-targeted UK public infrastructure projects is 1.4, which means every £1.00 spent on infrastructure would yield £1.40 in additional output and income.

Innovation is also key to long run productivity growth, and the UK has a comparative advantage in the 'knowledge economy' based on its world-leading university and research networks. Yet publicly funded research and development is lower than most major economies (LSE Growth Commission, 2013). It is estimated that a 10 per cent increase in UK public funding for research and development could boost private sector long-term total factor productivity growth (the engine of economic growth) by 0.03 percentage points per annum (Haskel *et al.,* 2015).[27]

Nervousness after the Brexit referendum vote has exacerbated the impact of a protracted slowdown on potential growth. The key responsibility of HM Treasury is to ensure short-run fiscal and economic stability, but it also has a remit to guide investment in long-run capacity.[28] With this in mind, the Government has to spend money on the right things or incentivise the private sector so to do. The UK is still running a fiscal deficit of around 5 per cent of GDP and the bulk of this funds current consumption. Yet, a growing chorus of macroeconomists, such as Ken Rogoff (2013), Larry Summers (2014), Jonathan Portes (2013) and Simon Wren Lewis (2015), as well as the OECD, IFS and IMF, recognise that increased spending on infrastructure investment could be cost-effective and enhance fiscal sustainability in the long run.[29]

27 Total Factor Productivity (TFP) is the portion of output not explained by the amount of inputs used in production. It reflects how efficiently and intensely the inputs are utilised in production and TFP growth reflects innovation in technologies and processes.

28 The department's three objectives are: place the public finances on a sustainable footing; ensure the stability of the macroeconomic environment and financial system, enabling strong, sustainable and balanced growth, and increase employment and productivity, and ensure strong growth and competitiveness across all regions of the UK through a comprehensive package of structural reforms.

29 The case for fiscal activism over the cycle is also rehearsed in Bowen and Stern (2010) and Jacobs and Mazzucato (2016).

This is not solely, or even primarily, an argument for a Keynesian stimulus; it reflects strong neoclassical arguments for higher government spending when there is slack in the economy and resources are cheaper. The secular stagnation argument (best articulated by Summers, 2016) tells us that supply will create demand and not just vice versa. David Wilcox, Director at the Division of Research and Statistics at the Federal Reserve Board estimates that a significant portion of the recent weakness of the supply side of the economy was due to the weakness in aggregate demand. He goes on to argue that demand, backed by active fiscal policy, creates its own supply by boosting capital investment and raising labour participation (Reifschneider *et al.,* 2015).

9. Why build infrastructure?

Infrastructure investments are unique capital assets with durations of 20 years or more. They are characterised by high barriers to entry and are often large-scale and difficult to duplicate, so they tend to benefit from strong market positions, sheltered from competition. They can help resolve network externalities, where private investors will tend to underinvest, and unlock profitable new market opportunities. Infrastructure is an obvious cost-effective target for UK investment with strong productivity benefits. Without investment in infrastructure, time and money will be wasted transporting people and merchandise, energy supplies will become unreliable, communication will be slow and interrupted and a growing population will be poorly trained and badly educated and suffer from the ill-effects of bad housing and poor health.

One of the main reasons for government investment is the promotion of economic growth. One of the key components to supporting economic growth is the financing of public infrastructure projects (roads, housing, schools, hospitals and communication networks). Moreover, some projects with desired social returns (public goods) are not profitable for the private sector and thus are developed by the public sector. The Growth Commission (2013) set up by the London School of Economics and Political Science identified a number of priority areas for the UK, ranging from rail infrastructure, runway capacity, and road pricing, housing and broadband, as well as infrastructure supporting human and knowledge capital in the form education, skills and innovation. Investing in an infrastructure base will boost the returns to complementary private capital spending, helping to raise the returns to savers.

There is no lower-bound threshold for the 'right amount' of infrastructure investment, and much will depend on the quality of the capital stock as well the demographic projections for the country (for example, fast-growing and rapidly urbanising developing countries will have proportionately larger infrastructure requirements than developed countries). But the OECD (2013) suggests that an annual investment of 3.5 per cent of GDP into infrastructure is necessary in developed countries to prevent negative impacts on growth.[30]

According to HM Treasury (2014), the UK spent an average of £47 billion a year on infrastructure (public and private) between 2010-11 and 2013-14, equivalent to approximately 2.75 per cent of annual GDP. The UK regularly scores poorly on international comparisons of its infrastructure. In its Global Competitiveness Report 2015-16, the World Economic Forum ranked the UK 24th out of 144 countries for the overall quality of its infrastructure, behind most of its main competitors (WEF, 2015). In the short term, the possibility of recession means spare capacity in the jobs market. The implementation of 'shovel-ready' infrastructure projects (which will be discussed in the accompanying policy brief) offers a means to preserve jobs and boost the wages of the low and middle income earners, helping deliver Theresa May's economic vision.

30 See also Jones (2016).

The numerous political economy issues concerning whether it is possible to achieve a temporary increase in Government spending, funded through public borrowing, are abating. The previous Government had attached a strong political premium to fiscal austerity and any perceived reversal would have been embarrassing, not least because the Chancellor, George Osborne, had committed himself to achieve a fiscal surplus by 2019-20. All this changed after the referendum on the UK's membership of the EU. The decision to leave the EU means that the UK's deficit reduction targets are unlikely to be attained through attempts to reduce the primary fiscal deficit, except at very high economic and political cost. This left the Government with little option but to abandon its target. This opens the way for greater fiscal flexibility, at least in the short term.[31] It would make no sense if failure to meet fiscal targets because of lower than expected growth were used as a reason to tighten fiscal policy further, thus engendering even lower growth. The Office for Budget Responsibility should testify to the Government's long-term commitment to fiscal stability by acknowledging that short-term flexibility is the best way to attain this.

In the context of the recent Paris Agreement on climate change, any Government investment in large infrastructure should be 'fit for the future' and allow the UK to stay competitive by shifting resources to fast-growing low-carbon markets. Failure to do so risks the potential for costly mass-scrapping and stranding of productive assets. The choice is not between green and non-green investment. Infrastructure investment will last 20 years or more and so must be designed to avoid locking in to, and possibly stranding, carbon-intensive assets, networks and behaviours. Failure to lock into low-carbon infrastructure risks a loss in the value of public assets as the Government struggles to meet its own carbon targets. The return to such investment would then be poor. Infrastructure that is fit for the future will have to be low-carbon and resource-efficient.

10. Now is the time to seize the opportunity

This is a first of two policy briefs seeking to address five inter-related, and often pressing, policy concerns. These can be summarised as the need to:

1. boost investment, create jobs and restore confidence;

2. boost UK productivity growth by encouraging productive investment in the UK's aging infrastructure;

3. secure the long-term sustainability of the public finances;

4. rebalance growth across regions and social classes and address the problem of the 'squeezed middle';

5. ease growing macroeconomic imbalances associated with the flood of liquidity that underpins the Bank of England's attempt to support domestic demand; and

6. invest in decarbonising energy, transport and buildings at a time of high public indebtedness consistent with meeting the UK's emissions targets.

All these are related by a common factor – the prolonged surplus of global desired saving relative to weak investment appetite.

31 The primary budget balance is the government budget balance before interest payments.

The new Government has set out its plans to steer the UK economy through a period of uncertainty, to deal with Britain's longstanding productivity problem and to create more well-paid jobs. The macroeconomic measures identified in this policy brief will be most effective if complemented by structural reform to boost UK productivity. As the IMF and OECD have recently argued, structural reforms work best in an expansionary policy environment.[32] However, a preoccupation with Brexit negotiations, coinciding with a necessary response to the resulting economic disruption, may limit the Government's appetite for structural reform. This makes a new macroeconomic approach all the more urgent. The traditional mix of fiscal austerity to reduce public debts/deficits will continue to prove economically and socially counterproductive.

Institutional change is likely to be necessary to ensure a transparent and efficient process for determining investment priorities, while meeting long-run fiscal sustainability rules. These will be discussed in the accompanying policy brief. The Bank of England has no mandate to influence fiscal policy and operates a 'reaction function' to do whatever it thinks necessary to balance the economy and meet its inflation target. It will respond to increased fiscal austerity, all else equal, with tighter monetary conditions. Yet the evidence presented above suggests the need for the opposite mix. Even from a neoclassical economic perspective, zero real borrowing rates and cheap resource prices present an historic opportunity to boost output permanently by expanding supply through investment.

By contrast, Keynesian demand management and neoclassical supply-side economics both argue for public sector surpluses in good economic times, when the private sector is over-extending itself and markets are tight and overheating. Unfortunately, the political economy often dictates the opposite; loose fiscal management comes easily over the boom years, such as those preceding the 2008 crash when the public finances were flush and spending was justified on the basis of inflated expectations of future trend growth (on which all the projections for the public finances are based). The result was that the Government was left with limited capacity to boost current (as opposed to capital) expenditure after private spending collapsed in the wake of the financial crisis. Similar mistakes must not be repeated, suggesting the need to reconsider long-term transparent fiscal frameworks, but in the meantime the opportunity to cost-effectively boost public investment remains.

The ability of the UK to take advantage of the accommodative global surplus of cheap saving may not last forever. Some estimate the global economy is already growing above trend and that a global rise in interest rates is imminent (Davis, 2016). Sooner or later baby-boomers will start to draw down savings for retirement and confidence in the productivity potential of new technologies is likely to be restored (though perhaps not to the euphoric heights of the 'new economy' 'dot.com' excesses that preceded the financial collapse of 2008). If this happens, the natural real interest rate might be expected to return towards its historic norm and the costs of financing infrastructure will go up. It would be a pity if institutional design, combined with political short-termism, compromised the UK's ability to chart troubled economic waters, expand productive capacity and meet global carbon targets, by allowing this opportunity to be squandered. Precisely what institutional reform and policy mix is required to induce public and private long-term infrastructure investment forms the subject of the accompanying policy brief. In the meantime, an understanding of the macroeconomic environment makes clear that the time for these changes, combined with cheaply-financed fiscal support for long-term infrastructure investment, is now.

32 See for example IMF (2016) World Economic Outlook Chapter 3: 'Time for a Supply-Side Boost? Macroeconomic Effects of Labor and Product Market Reforms in Advanced Economies', and also Romain and Furceri (2016). 'Structural reform' means adopting flexible trade, labour market and competition policies will allow resources to shift faster and more effectively to the most productive sources of activity, at the expense of declining sectors.

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