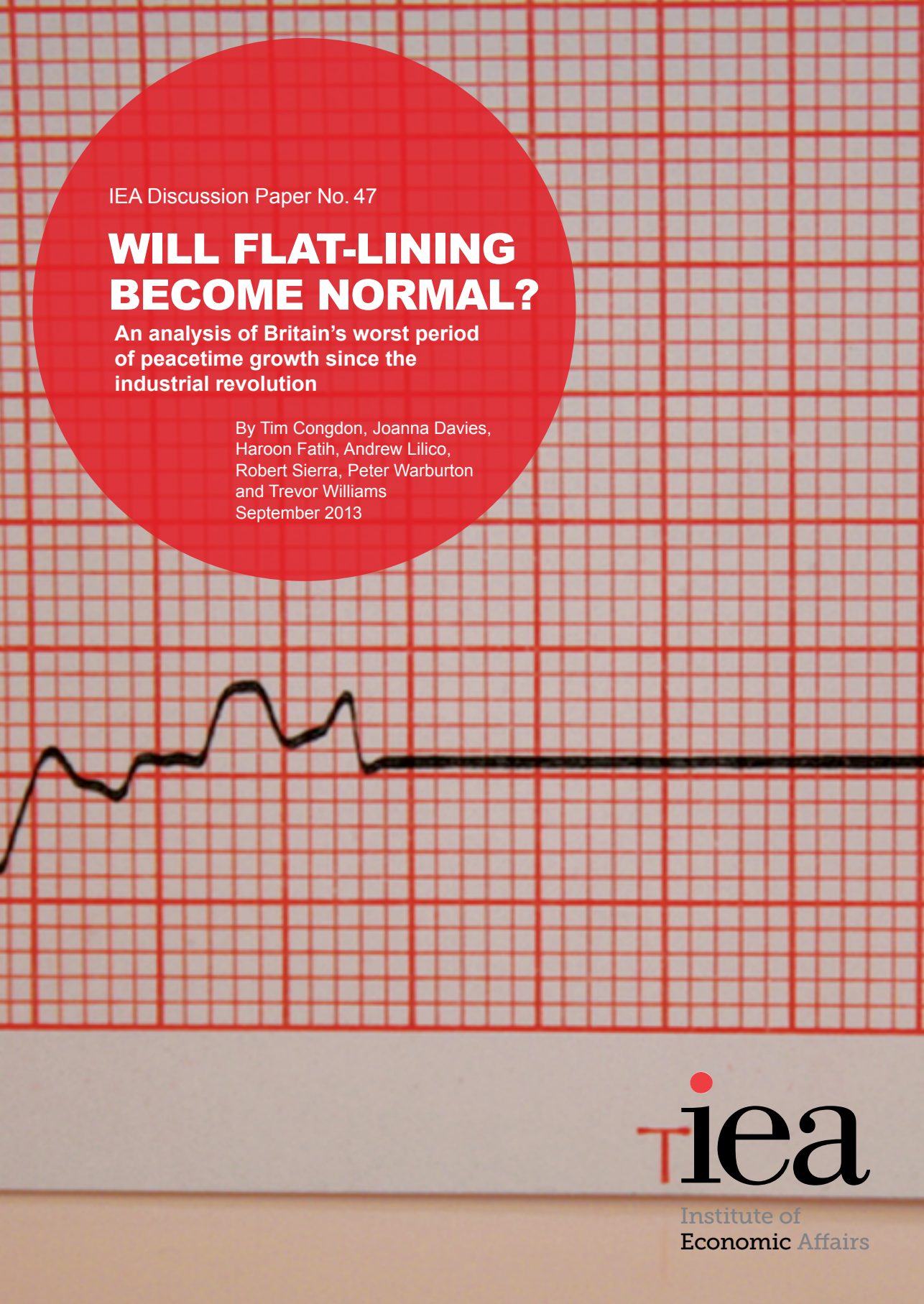

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WILL FLAT-LINING BECOME NORMAL?

An analysis of Britain's worst period of peacetime growth since the industrial revolution

By Tim Congdon, Joanna Davies, Haroon Fatih, Andrew Lilico, Robert Sierra, Peter Warburton and Trevor Williams

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Summary

The UK's sustainable growth rate has been much lower than that calculated by the OBR and used by the government to forecast public finances.

The lack of growth is important in its own right. However, it is also important as far as the government's 2010 deficit reduction plan is concerned. This plan relied upon economic growth raising tax receipts for 70 per cent of the deficit reduction. Lack of growth is the key factor behind the government's deficit reduction plan being off target.

There is no reason, given the fall in the sustainable growth rate, why we should expect high levels of 'catch-up' growth to compensate for the loss of output after the 2008 crash.

From Q1 2008 to Q1 2013, average annual output growth has been -0.7 per cent. Such a disappointing growth performance has no modern historical precedent.

Gross domestic product dropped 6.3 per cent from the peak level reached in 2008 and is still some 3 per cent lower than its peak five years later. That is unprecedented in 170 years of shocks that have hit the UK economy since industrialisation.

It is clear that poor total factor productivity has driven the poor growth performance. Capital stock - and changes in it - has played very little direct part. The poor growth performance will not be addressed by increased investment or increases in 'aggregate demand'. Loosening fiscal policy by increasing government spending will worsen rather than improve the situation.

Productivity growth has been -0.4 per cent in recent years.

Productivity often falls in a recession due to labour hoarding but recent performance is especially bad compared with previous recessions. Productivity growth has, on average, been unsatisfactory compared with past norms, by almost 1 per cent a year for five years.

In the medium term, the UK's sustainable growth rate is likely to be very low for a number of reasons. These include:

- Increased public spending and taxation as a proportion of GDP due to the rapid increase in the early twenty-first century. This factor alone has reduced the sustainable growth rate by around 0.5 per cent – possibly more
- Increased government, corporate and household debt relative to GDP
- Demographic pressures from an ageing population
- Increased regulation of the energy and financial services sectors. These sectors had contributed substantially to the productivity performance of the economy in earlier decades
- The depletion of North Sea oil
- The arithmetical affect of low-productivity immigrant workers being added to the working population
- The huge growth in credit before the crisis, followed by its contraction since – partly driven by increased banking regulation.

As a result of these policies, the sustainable growth rate has fallen by over 1 per cent compared with the level before the crisis. Actual growth rates might be higher than 1 per cent, of course, if the economy recovers some of the lost output caused by the crash. However, high 'catch-up' levels of growth are unlikely in the medium term.

Low interest rates and government bond yields are a further indicator that the medium-term sustainable growth rate is very low.

The factors causing low growth are generally policy induced and could be changed. Furthermore, policies could be followed that would increase productivity growth such as radical reform of our education and health systems.

There will be some natural improvement in the sustainable growth rate after 4-5 years if the government manages to reduce spending as a proportion of national income as planned and if household, corporate and government debt fall. Also, the productivity levels of the energy sector may increase if shale gas is developed. These factors may lead to the sustainable growth rate rising. It may even reach the level of around 2.3 per cent which is the current rate currently used by the OBR for its unrealistic short-term projections.

Britain's sustainable growth rate[1]

by Andrew Lilico

Introduction

This paper explains:

- How I think about and model the sustainable growth rate of the economy.
- Why I believe the sustainable growth rate of the economy is currently low - around 1.1 per cent.
- Why, by around the end of the current Parliament, the sustainable growth rate might rise. It is important to note, that I do not argue that the economy will improve by the end of the Parliament but that the medium-term outlook from that time will improve (i.e. the prospective average growth rate over the following 10 to 20 years).

The data on which the calculations and conclusions are based are from late 2011 and references to government projections relate to that time too. Thus the analysis does not embody the potential implications of a disorderly collapse of the euro zone. Indeed, the purpose of this paper is not to provide commentary on current economic events and difficulties but to analyse the underlying problems of the UK economy. As such, it deliberately avoids examining the implications of the current situation in the euro zone.

1 This paper is based on evidence given to the House of Commons Treasury Select Committee.

Total market returns

In this section it will be argued that:

- When the economy does better, total enterprise returns are greater (and vice versa).
- This tends to mean that, when the economic *outlook* is better (i.e. the economy is expected to do better in the future), required total market returns to capital also tend to be higher (and vice versa).
- Matters can, however, be somewhat complicated by the fact that total enterprise returns are divided between returns to capital and returns to labour. Evidence suggests that labour may be obtaining a diminishing share of total returns.
- There is a relationship between the risk-free rate of return and the sustainable growth rate of the economy, both in theory and in statistical evidence.
- There is good reason to believe that, although the next few years may see quite low growth for the UK economy (indeed, perhaps the economies of many developed countries), within the next few years the medium-term outlook (the outlook beyond the next few years) may improve, raising sustainable growth rates and associated with a rise in the risk-free rate.
- When economic conditions are weak, the equity risk premium tends to be elevated. However, the elevation in the equity risk premium is not always as great as the fall in the risk-free rate, so total market returns often fall.
- Conversely, when economic conditions improve, although the equity risk premium may fall back, it should not be expected to fall back as much as the risk-free rate rises, so total market returns should be expected to rise.
- After a major economic and financial crisis, one might expect lasting impacts on risk appetites.

- A major economic and financial crisis might also be associated with changes in (a) the degree of skewness and kurtosis in returns; and (b) how much investors care about skewness and kurtosis (e.g. the price of skewness).

The relationship between market returns and macro-economic conditions

When economic growth is higher, firms tend to have greater earnings. Demand is higher, so the gross value added by businesses increases. Faster economic growth leads to greater total enterprise returns.

So, if economic growth is *expected* to be higher in the future, there are expected to be greater enterprise returns. Total enterprise returns are divided between labour and capital. If the split (the ratio) can be taken as given (or indeed if returns to labour can be taken as fixed), then a rosier economic outlook implies that returns to capital will be greater. If investors, responding to a rosier economic outlook, did not demand higher returns, they would be conceding that labour would take all the benefit from faster growth. Normally, however, capital demands its share of the expected larger pie.

This is the straightforward case, but it is worth noting that there is no iron rule here. If there is a change in the capital/labour split of returns, that could in principle reverse the overall effect or enhance it. For example, poor economic times could coincide with a fall in the share of total returns taken by labour, so that total returns to capital could rise even as total enterprise returns fell. As an alternative example, rosier economic times could coincide with labour taking a lower share of total returns.

As it happens, evidence suggests that labour has obtained a very stable share of total returns over the past decade - employee compensation was 54.5 per cent of GDP in 2000 and 54.8 per cent

of GDP in 2010.[2] The key change here occurred during the 1980s. In 1970 and 1980 employee compensation was around 59 per cent of GDP, but by 1990 this had fallen to 55 per cent. Since 1990 the proportion has been very stable.

If a period of elevated returns is relatively brief - for example, if it occurs only for a year or two in the recovery phase from a recession - then, although actual returns to capital may be higher, the required rate of return will not. Over the lifetime of an investment, there will naturally be some years in which actual rates of return are below the cost of capital and others in which actual rates of return are higher. But, overall, average expected rates of return will equal the cost of capital.

On the other hand, periods of slower or higher growth could be more sustained than this. In economics, the 'long-term' refers to the period over which there are no fixed costs - when all investments must be renewed. A period of low or high growth sustained for a longer period than the lifetime of investments is not merely cyclical in nature: it is structural and should be expected to affect not merely year-to-year actual returns but also the required rate on return on investment. This is because, if low/high growth is sustained and economy-wide, then it affects the opportunity cost of investment. For example, if the sustained growth rate is lower over a long period, we cannot simply wait a brief time and invest under more favourable circumstances.

Finally, we observe that economic 'shocks' affecting the sustainable growth rate can be both good and bad in nature. There might be new technologies that raise the sustainable growth rate (e.g. by stimulating more rapid innovation); or there might be sustained rises in the cost of inputs into a production process (e.g. if the price of a wide range of raw materials increased in the long term).

2 Source: National Statistics, UK Economic Accounts, Table A3: 'Gross domestic product: by category of income'.

Relationship between the sustainable growth rate and the risk-free rate

Theoretical relationship

It is common to think of the risk-free rate of return as an exogenous variable - if it is not actually constant, then we like to think of it as being fixed by factors outside portfolio decision-making. We think of the risk-free rate as a measure of impatience, of how much we would rather have things today than tomorrow.

However, though there is much in this, it is not quite the whole story. For the risk-free rate is not simply the return any one individual would require to hold a risk-free asset. Rather, it is the return that *would be available* from such an asset. As such, (a) it reflects collective tastes, rather than those of any individual - the 'taste' of the market; and (b) it reflects an (albeit notional) equilibrium condition.

In standard long-term economic growth models, such as the Ramsey-Cass-Koopmans model, a key equilibrium condition is that (in the absence of population growth) the sustainable growth rate of the economy equals the risk-free rate (Ramsey, 1928; Cass, 1965). Indeed, in corporate finance theory the risk-free rate of return is sometimes viewed as arising from the sustainable growth rate (i.e. causality runs from the sustainable growth rate to the risk-free rate).

For our purposes here, we need not fully endorse either of these positions. Instead, we make the more limited claim that one should expect changes in the risk-free rate to be correlated with changes in the sustainable growth-rate.

We can make this thought more concrete by considering the likely relationship between the sustainable growth-rate and our best proxy for the risk-free rate: namely yields on government bonds. If, for example, yields on medium- to long-term government bonds are very low, we should interpret that as an indicator that the sustainable growth rate of the economy is expected to be very low.

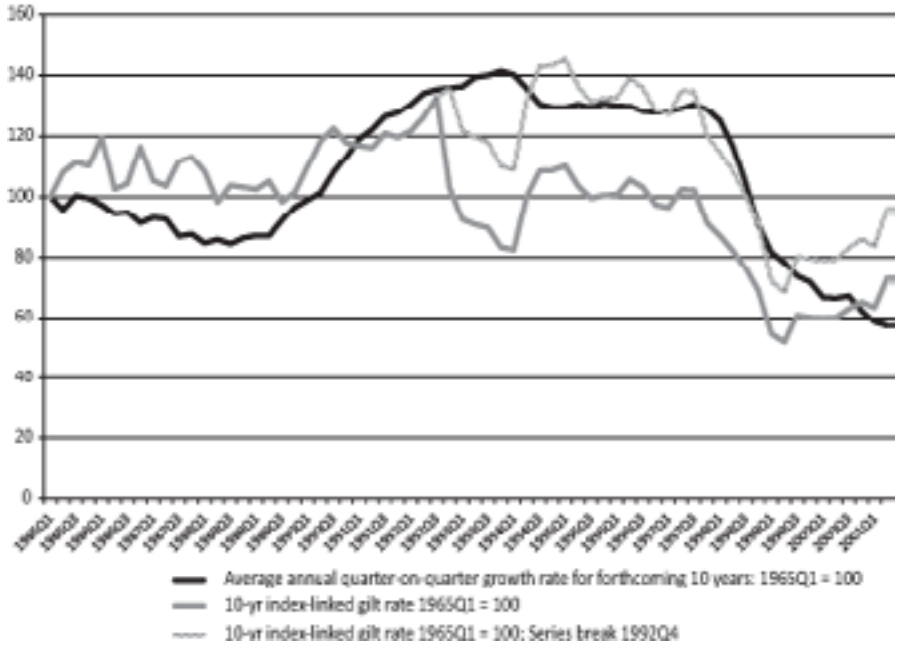
Why is this? Consider an investor that is willing to buy a government bond at a very low yield. That investor is choosing to purchase that government bond in preference to, for example, shares or

bonds in any other business in the real economy. But that must indicate that expected returns for the real assets of these other real economy businesses are expected to be low or very volatile. Let us set aside the problem of high volatility for now and focus on the case in which returns of these real economy businesses are low. If returns to all real assets are low, over the medium- to long-term, then the economy can only be expected to grow slowly over the medium- to long-term. But the sustainable growth rate is simply the rate at which the economy can grow over the medium- to long-term. So (setting aside issues of policy mistakes etc. that might eventually be rectified), when government bond yields are very low, one plausible explanation is that the sustainable growth rate of the economy is very low.

The statistical relationship

In Figure 1, we compare the average quarterly yield on 10-year index-linked bonds with the actual average growth rate over the subsequent 10 years. To make the relationship easier to see, we have 'normalised' both series so that, as they begin in the first quarter of 1985, we call them both 100. Because they look ahead 10 years, the data in this graph ends at the beginning of 2001 (we will look ahead below). We can see that movements in growth mirror movements in the index-linked gilt yields fairly well: the correlation is 0.49. If we believe that the introduction of inflation targeting in the fourth quarter of 1992 can be treated as a game-changing event, we can compare the right-hand end of the growth line with the relative level of index-linked gilt yields instead. These series have a correlation of 0.83, which is very high.

Figure 1: Comparison of growth and index-linked gilt yields (1985Q1 = 100)



Caveats

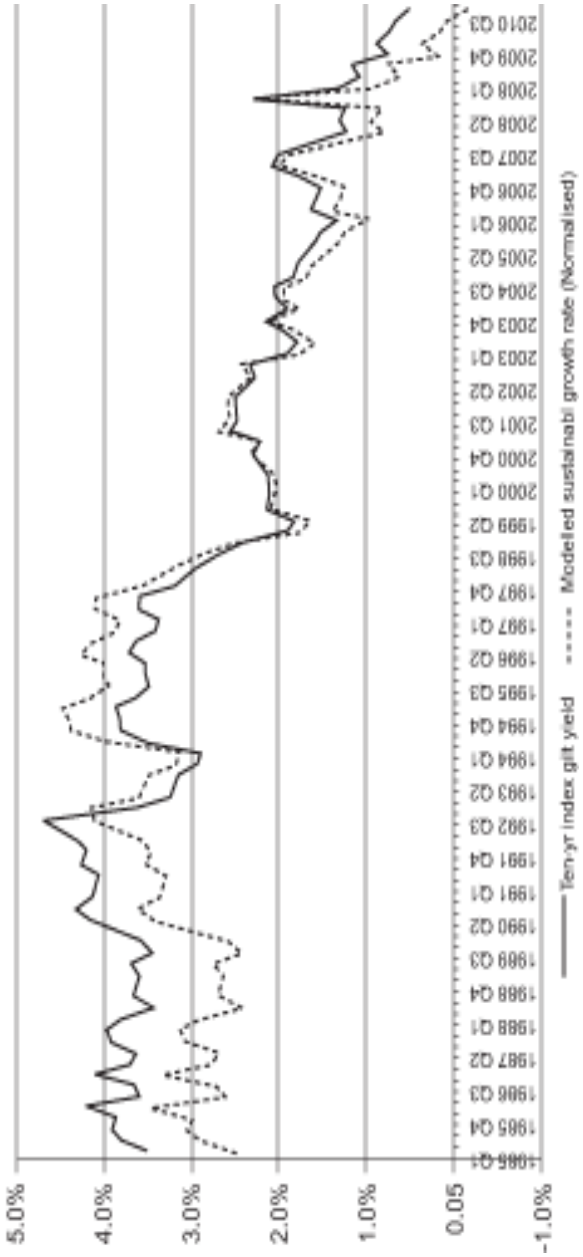
We focus on 10-year index-linked gilt yields and growth rates here. Five-year gilt yields can be significantly affected by policy expectations - for example, in a recession interest rates may be set low, dragging down the five-year gilt yield. Since our data begins only in 1985, the use of 20-year values would make our dataset very short (just five years instead of fifteen). However, we acknowledge that there is a compromise here. The actual growth rate could, in principle, deviate materially from the underlying sustainable growth rate even over a 10-year horizon. For example, one interpretation of our non-break-adjusted series could be that actual growth rates were below sustainable growth rates during the 1980s but then above sustainable growth rates during the 1990s (perhaps 'catching up' on the 'lost growth' of the 1980s). One implication of this reflection is that it is not obvious, despite the higher correlation, that our break-adjusted series is really the better series for correlating to 10-year-ahead growth rates.

Predictions of the model

These caveats notwithstanding, the result of our analysis is that the close relationship that theory predicts between the risk-free rate and the sustainable growth rate appears to be borne out in practice. The sustainable growth rate of the economy appears to have been fairly stable from the mid-to-late 1980s, risen somewhat in the early 1990s, and fallen fairly rapidly from the second quarter of 1997 to below its late 1980s trough.

In Figure 2, using the correlation between the break-adjusted series for the index-linked gilt rate and the sustainable growth rate to model the sustainable growth rate, we assume that the sustainable growth rate was 2.5 per cent at the start of 1985 and that changes in the risk-free interest rate and sustainable growth rates are proportionate to one another.

Figure 2: Modelled sustainable growth rate versus index-linked gilts yield



According to our model, the sustainable growth rate peaked at about 4% in the mid-1990s, and had fallen to about 2% by the end of 2000. The rate continued at around 2% until 2002, when it started falling again. There is a brief odd blip up in mid-2007, and then the spike in late 2008 (which surely reflects a sudden rise in sovereign default risk - i.e. the model is breaking down as the index-linked gilt yield is no longer nearly risk-free). From the first quarter of 2009 we also get a downward distortion, as quantitative easing is estimated by the Bank of England to take perhaps a whole percentage point off yields.

So, there are distortions from late 2008 that make it difficult to estimate what happened next. However, Ofcom estimated the risk-free yield to be 1.4 per cent in July 2011 (Ofcom, 2011). In our model, a figure of 1.4 per cent for the index-linked gilt yield would imply a sustainable growth rate of 1.1 per cent and this is our preferred assumed figure. We note that current market yields are well below 1.4 per cent. Thus, our 1.1 per cent figure for the sustainable growth rate should be considered subject to considerable downside risk.

Why the sustainable growth rate is likely to be low

The Office for Budget Responsibility (OBR) claimed in its March 2011 report that the growth rate of potential output (in essence, what we are referring to here as the sustainable growth rate) is around 2.1–2.35 per cent (see, for example, OBR, 2011) In its November 2011 report this was downgraded to 1 per cent since 2009, rising to 1.2 per cent in 2012, 2.0 per cent in 2013 and 2.3 per cent from 2014. Our view is that the sustainable growth rate is somewhat lower than this.

As noted above, the interpretation of bond yields from late 2008 is problematic as they may have been subject to a number of distortions. However, is it credible that the entirety of falls in these variables reflects passing market distortions, as opposed to the sustainable growth rate having fallen? We point to five key factors that suggest it might indeed be credible that the sustainable growth rate has fallen materially:

- Increased public spending/taxation relative to GDP
- Increased level of government debt relative to GDP
- High corporate sector debt relative to GDP
- High household debt relative to GDP
- Increased demographic pressures.

Each of these cases is now considered in turn. We emphasise that, in each case, what we propose is that a relevant factor has arisen in recent years that would tend to depress the rate of overall economic growth for long enough to affect the future long-term sustainable growth rate. Though a number of these factors might eventually be turned around, we suggest that they will persist for much of the current parliament.

Government spending relative to GDP

There is extensive academic empirical literature on the relationship between levels of government spending, tax and GDP growth. Broadly stated, the conclusion of this literature is that at above about 25 per cent of GDP increasing public spending further reduces the long-term growth rate of the economy (especially if such increases take the form of greater government consumption expenditure, as opposed to investment expenditure or transfers).

This does not, of course, mean that it would be desirable for the government only to spend 25 per cent of GDP. Here, we make no comment on the desirable level of government spending, only on the impact of spending on growth.

Regarding the impact of public spending, two particularly important recent studies make the following findings: Afonso and Furceri (2008) conclude: ‘a percentage point increase in the share of total revenue (total expenditure) would decrease output by 0.12 and 0.13 percentage points respectively for the OECD and for the EU countries’; Mo (2007) suggests ‘a 1 percentage point increase in the share of government consumption in GDP reduces the equilibrium GDP growth rate by 0.216 percentage points’. The literature on

the impacts of taxation gives similar results. The definitive study in that literature was that of Leibfritz et al. (1997). They find that a 10 percentage point increase in the tax to GDP ratio reduces the growth rate by 0.5–2.0 percentage points. The practitioner rule of thumb here is that each additional percentage point rise in sustained levels of government spending/tax should be expected to take 0.1–0.15 per cent off the growth rate of the economy.

Total managed expenditure in the UK reached a trough of 36.3 per cent of GDP in financial year 1999–2000.[3] This was the lowest figure recorded since straightforwardly comparable records began in the early 1960s. It peaked at 47.6 per cent in 2009–10: a rise of 11.3 percentage points over a decade.

During the high-government-spending period of 2008–09 to 2014–15, which is projected to involve an average level of government spending of 44.6 per cent of GDP, growth is likely to be depressed. We note that the 10-year average was below 42 per cent of GDP for every 10-year period commencing each year between 1985–86 and 2001–02, and levels of around 40 per cent were typical. As such, 44.6 per cent constitutes a rise of two to four percentage points of GDP. Using the practitioner rule of thumb, a two to four percentage point increase in government spending relative to GDP implies a 0.2–0.6 per cent fall in sustainable growth rates.

Government debt relative to GDP

In their August 2011 Bank for International Settlements paper, Cecchetti et al. (2011) analyse the impact of various forms of debt upon growth rates. Their conclusions are that, beyond a threshold level, debt is damaging to growth. That threshold level in respect of government debt is around 80–100 per cent of GDP.

3 Source: public finances databank: http://www.hm-treasury.gov.uk/d/public_finances_databank.xls

On UK government definitions, UK general government gross debt relative to GDP is projected to peak at 87.2 per cent of GDP in 2013–14.[4] This compares with 37.0 per cent in 2001–02. The average from 1990–91 to 1999–2000 was 44.1 per cent. The previous peak on straightforwardly comparable statistics was 64.2 per cent in 1976–77. On Cecchetti et al.'s definitions, public sector debt rose from 42 per cent of GDP in 1990 to 54 per cent in 2000 and 89 per cent in 2010.

Cecchetti et al. find that an additional 10 percentage points of GDP of debt above the threshold reduces annual trend growth by around 0.1 percentage points. In the pessimistic case that, for the UK, the crossover threshold is at 80 per cent of GDP, an additional seven percentage points of debt would correspond to a fall in GDP growth of around 0.07 per cent.

Corporate sector debt relative to GDP

Using figures from Cecchetti et al., UK corporate sector debt rose from 93 per cent of GDP in 2000 to 126 per cent in 2010. The threshold level for corporate sector debt, above which it reduces trend growth, is about 90 per cent of GDP. Each additional 10 percentage points of debt above this level reduces trend growth by around 0.05 per cent. Being 30 per cent above the threshold would be expected to reduce trend growth by around 0.15 per cent.

Household debt relative to GDP

UK household debt rose from 75 per cent of GDP in 2000 to 106 per cent in 2010. Cecchetti et al. believe that there should be a similar threshold level for household debt to that applying for government and corporate sector debt. They state that their best guess as to this level is around 85 per cent of GDP. However, it should be noted that in their statistical tests, though 84 per cent was their models'

4 Source: Public Finances Databank, August 2011 version: http://www.hm-treasury.gov.uk/d/public_finances_databank.xls

highest likelihood value for the threshold, the results were far from statistically significant.

A related possibility, which Cecchetti et al. did not (directly) explore, is that household debt has its effect upon growth primarily through increasing the likelihood of financial crises. Banking sector crises have a huge effect in their model: each additional year of crisis takes 0.27 percentage points off annual growth for the following five years.

Demographic effects

In the Cecchetti et al. model, a one standard deviation increase in the dependency ratio (the ratio of the non-working to working population), or an increase of around 3.5 percentage points in that ratio, is associated with a 0.6 percentage point reduction in future average annual growth. Dependency ratios in the UK have been projected to rise significantly. The number of people of state pension age was projected, by the government in 2009[5], to increase by 32 per cent from 11.8 million in 2008 to 15.6 million by 2033, whilst the number of working age is projected to rise by just 14 per cent from 38.1 million to 43.3 million.

Tentative conclusion on the potential depressing effect upon the sustainable growth rate

Given all the factors coming together, the potential depressing effect on growth could be very large:

- 0.2–0.6 per cent in respect of increases in public spending
- 0.07 per cent in respect of excessive government debt
- 0.15 per cent in respect of excessive corporate indebtedness
- An amount that is difficult to estimate due to household indebtedness

5 http://www.ons.gov.uk/ons/rel/npp/national-population-projections/2008-based-projections/statistical-bulletin-october-2009.pdf

- A material amount because of the increase in dependency ratios.

Altogether, these effects suggest that it is credible that the UK's sustainable growth rate could, as gilt rate movements over the past few years imply, have fallen by more than a percentage point below the 2.5 per cent rate commonly accepted in the early- to mid-2000s and assumed in most government forecasts of that era.

If economic conditions have recently deteriorated even further, with peak levels of government and household debt likely to rise even higher, creating greater impediments to medium-term growth and making it even harder to reduce government spending relative to GDP, then the sustainable growth rate might even have declined in the very recent past. Following its recession of the early 1990s, Japan only achieved an average annual GDP growth rate of 1.2 per cent in the period 1992 to 2001, and indeed still only grew at an average of 1.0 per cent annually from 2001 to 2010 (IMF, 2011). That compared with an average annual growth rate of 5 per cent from 1981 to 1990 - a drop of four percentage points. A fall of only perhaps 1.5 per cent in the UK's sustainable growth rate, following the most global and most serious financial crisis in history, in a country that begins at above Cecchetti et al.'s thresholds in all sectors, would, in fact, be a very fortunate result.

The sustainable growth rate (and hence risk-free rate) is likely to increase

It has been argued that the sustainable growth rate of the economy is likely to be around 1.1 per cent at present. However, it is plausible - indeed, likely - that the sustainable growth rate could return to previous levels during the next few years, perhaps even exceeding 2.3 per cent by the middle of the next parliament. That does not mean, of course, that average economic growth will be above 2 per cent during the next few years or even over the 2010s as a whole, as the underlying growth rate may only be around 1.1 per cent for

the early years of the period.[6] Rather, it plausible that, within the next few years, the average growth rate for the following 10 years or so could be in the region of (or perhaps even higher than) the 2.3 per cent that the OBR suggests.

Longer-term gilt yields imply a significant rise in 10-year yields by late 2016

As of 31 August 2011, the real implied 10-year-ahead yield on UK gilts was 0.02% (Bank of England). But the implied yield for the 10 years from August 2016 was 1.08% - a rise of more than a percentage point in the 10-year yield over the next five years.[7] These figures can be inferred from a full break down of the yields on index-linked government bonds.

Though a positive government bond yield curve slope is normal, the current positive slope is abnormal. Furthermore, the yield curve does not flatten after around eight years as is normal. The rise in yields across the curve is considerably more and over a longer timescale than can usually be attributed to pure monetary policy choice effects (for example, decisions to keep interest rates low in the short term to smooth out economic fluctuations such as recession). A rise in the risk-free real yields of over one per cent in the six to 16 year phase (and indeed extended beyond that, even still rising materially to 30 years) indicates a significant and unusual effect. It is possible that some element of this is a rise in liquidity premia, but it seems very likely that the overwhelming majority of this effect reflects an expectation that 10-year yields will be much higher by 2017 than those yields are today. As it happens, the Competition Commission - and others - have raised concerns about very-long-dated yields being distorted. However, the general view is that they are likely to be distorted *downwards*, not upwards, for example by pension fund regulation.[8]

6 Of course, if there is an 'output gap', then in addition to the underlying trend rate of growth, the economy might have the capacity to 'catch up', also, growing faster than its trend rate.

7 For February 2017 the figure is 1.09%.

8 For example, see paragraph 70, http://www.competition-commission.org.uk/rep_pub/reports/2010/fulltext/558_appendices.pdf

Why the sustainable growth rate is likely to increase

The yield curve evidence suggests that the sustainable growth rate is expected to increase but, of course, does not indicate why. Notwithstanding the arguments of previous sections that the OBR is too optimistic regarding how *rapidly* the sustainable growth rate might revert to closer to its historic norms, is it credible that, in due course, the long-term sustainable growth rate might rise in the way implied by longer-term gilt yields, perhaps reaching the 2.3 per cent claimed by the OBR or even, thereafter, rising higher, perhaps to the 2.5 per cent or so that has been the UK's longer-term historical average?

There are six key reasons why this might happen:

- Reduced public spending and/or taxation relative to GDP
- A reduction in the level of government debt relative to GDP
- A reduction in corporate sector debt relative to GDP
- A reduction in household debt relative to GDP, and an end to the financial crisis
- An increase in the state pension age leading more people to defer retirement
- An increase in the rate of productivity growth in the public sector.

We shall now consider each of these cases in turn. In each case a relevant factor has arisen in recent years that would tend to depress the rate of overall economic growth for long enough to cover an entire investment cycle - and thus, in the economist's sense of 'long term', affect the long-term sustainable growth rate - but that can reasonably be expected to be at-least-partially reversed by the middle of the next parliament.

Total managed expenditure peaked at 47.6 per cent in 2009-10 - a rise of 11.3 percentage points over a decade. Had such a level of expenditure been maintained, with taxes raised to match it, the rate of GDP growth could be expected to be reduced as a consequence. However, the government plans to reduce spending back to 39.9 per cent by 2015–16. If, for the 10 years following that point, spending

were maintained at around 40 per cent of GDP, the sustainable growth rate could be expected to be materially higher than during the high-public-spending period of 2008–09 to 2014–15 during which average government spending is likely to be around 44.6 per cent of GDP. If we assume that taxes would have to be set on average at no more than 3 percentage points of national income below spending (for example, according to the Maastricht sustainability criteria), a five percentage point reduction in long-term spending relative to GDP would imply around a five percentage point reduction in taxes. Using the Leibfritz et al. finding, a five percentage point reduction in long-term tax rates implies a 0.25–1 per cent rise in sustainable growth rates.

To see whether a sustained cut in average long-term spending on this scale is plausible, we note that public spending was 40.9% of GDP in 2007 and the 10-year average was below 42 per cent of GDP for every 10-year period commencing each year between 1985–86 and 2001–02. It thus seems entirely plausible that public spending will be materially lower, relative to GDP, from 2017 onwards than has been the case in recent years.

As far as government debt is concerned, according to UK government definitions UK general government gross debt relative to GDP is projected to peak at 87.2 per cent of GDP in 2013–14, falling to 83.5 per cent of GDP by 2015–16.[9] This compares with 37.0 per cent in 2001–02. The average from 1990–91 to 1999–2000 was 44.1 per cent. The previous peak on straightforwardly comparable statistics was 64.2 per cent in 1976-77. According to Cecchetti et al.'s definitions, public sector debt rose from 42 per cent of GDP in 1990 to 54 per cent in 2000 and 89 per cent in 2010. Cecchetti et al., find that an additional 10 percentage points of GDP of debt, above the threshold, reduces annual trend growth by around 0.1 percentage points. If government plans to reduce the deficit take debt below the UK's threshold value from 2015–16 onwards and keep it there, that could increase growth by a further 0.1 per cent.

9 Source: Public Finances Databank, August 2011 version: http://www.hm-treasury.gov.uk/d/public_finances_databank.xls

The UK corporate sector has already materially deleveraged during the recession. It is natural to expect further deleveraging over the next five years as, relative to 2005–07, corporate debt spreads have risen dramatically increasing the relative attractiveness of equity versus debt. If corporate sector debt were to return to its 2000 level by around the middle of the next parliament that could be expected to add a further 0.15 percentage points to trend growth.

In addition, household debt in the UK has been falling back since its 2007 peak (Europe Economics, 2010). Further falls by 2015–16 could take it below growth-damaging levels, reducing the risk of further financial crises and reducing the growth-depressing debt overhang.

The government has also announced plans to accelerate rises in the state pension age - reaching 66 in 2020 instead of between 2024 and 2026 as previously planned (DWP, 2010). The rise to age 67 has also been accelerated. It seems plausible that announcements of further subsequent increases in pension ages will follow by 2015–16, reducing peak dependency ratios from those currently projected.

A further boost to growth could come from the public sector. From 1998 to 2007 average annual public sector productivity growth was 0.3 per cent, whilst that for the private sector was 2.3 per cent (see Bassett et al., 2010). It is, perhaps, natural that, in a period in which public spending rose rapidly, it was difficult to absorb large increases in spending whilst also increasing productivity. With government consumption constituting around 22 per cent of GDP, if the value of outputs over inputs grew 1 per cent more rapidly from 2015–16 onwards than from 1998–2007 (something that is certainly plausible given the tighter spending growth and the opportunity to tighten up public sector practices to make up for the lost productivity growth in the early twenty-first century) then that could add around 0.2% to GDP growth.

However, it is worth noting that, because of the ways in which GDP is measured, increased productivity growth in the public sector might not lead to rises in measured GDP growth on anything like this scale.

Tentative conclusion on the scope for a rise in the sustainable growth rate

If all these improvements were achieved together, the potential positive impact on growth could be very large:

- 0.25–1 per cent because of reductions in the long-term trend tax rate
- 0.1 per cent because of the reduction in government debt.
- 0.15 per cent arising from the reduction in corporate indebtedness
- An indeterminate amount for the reduction in household indebtedness
- A material amount for the reduction in the increase in dependency ratios
- Perhaps 0.2% for increased productivity growth in the public sector.

Altogether these values sum to more than 0.7–1.5 additional percentage points of average growth. Perhaps it is ambitious to believe that the top end of this range could really be achieved in practice, and without any offsetting other factors reducing sustainable growth. Nonetheless, the factors above do suggest that the government's own current projections for the sustainable growth rate could be credible by the middle of the next parliament. That is to say, by the middle of the next parliament, it is not totally unreasonable to believe that the sustainable growth rate for the UK economy could have returned from the recent very low values implied by risk-free rates (perhaps as low as 1.2 per cent) back towards the 2.3 per cent projected by the OBR or even perhaps to the 2.5 per cent longer-term value for the UK.

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The UK's poor productivity performance in the Great Recession and its aftermath: how is it to be explained?[10]

by Tim Congdon

The supply-side performance of the UK economy deteriorated in the Great Recession of 2008 and 2009, and has remained unimpressive in the hesitant recovery that has followed it. In the year to the third quarter 2007, which saw the run on Northern Rock and so heralded the financial strains of the Great Recession, national output was booming. As measured by gross value added in real terms, it rose by 4.7 per cent. From then until the third quarter of 2012 the average value of the annual change in national output was negative at *minus* 0.2 per cent. From Q1 2008 until Q1 2013, growth has been *minus* 0.7 per cent. National output dropped 7.3% from the peak level in the first quarter 2008 to the lowest point in the second and third quarters of 2009. At the time of writing, the latest quarter for which data are available is the first quarter 2013. National output then was still almost 4% less than in the first quarter 2008. The recent growth performance is unprecedented in the UK's peacetime history since the start of the Industrial Revolution.

10 This note expands observations originally made for the author's column in the *Economic Affairs* journal, 'Growing pains for the next government', in 2010.

However, employment has been surprisingly resilient in the Great Recession and has recently reached a new all-time peak. As the change in output can be viewed as the sum of the change in employment and the change in output per person employed (or 'productivity'), it is clear that the central disappointment of these years has been the stagnation of productivity. Table 1 shows that, in the five years to autumn 2012, productivity typically fell by 0.4 per cent a year, whereas in the preceding 45 years it rose on average by about 2.5 per cent a year. The question to be discussed here is 'why?'.

Table 1: Output and productivity trends

Period, five years to...	Average annual growth in output	Average annual growth in output per head
1967 Q3	3.7	3.2
1972 Q3	2.1	3.6
1977 Q3	2.4	2.2
1982 Q3	0.9	1.5
1987 Q3	3.8	3.0
1992 Q3	2.2	1.7
1997 Q3	3.4	2.8
2002 Q3	3.3	2.2
2007 Q3	3.1	2.2
2012 Q3	-0.2	-0.4

Source: Office for National Statistics, website data as at February 2012 (series mnemonic CDID).

One of the most well-known relationships in business cycle analysis is that between the rates of growth of output and productivity (see Figure 3). Numerous studies have found that employment exhibits far greater stability[11]. This feature of the labour market is presumably due to significant costs of hiring and firing for employers, and of job loss and search for workers.[12] The relative stability of employment means that years of high growth of output tend also to be years of high growth of productivity. The first part of the paper therefore considers the extent to which the recent poor productivity figures are to be attributed to the unsatisfactory output record of the UK economy in the Great Recession period. If the setback on productivity is readily blamed on the *cyclical* sluggishness of output, this would be relatively encouraging for the UK's macroeconomic outlook. It would imply that not too much has gone wrong with the long-term, underlying, *structural* characteristics of the economy, and that a return to higher growth of demand and output ought to be accompanied by a recovery in productivity growth. Unfortunately, a statistical exercise shows that recent productivity numbers have been significantly worse than can be explained by the past relationship between changes in output and productivity. Something fundamental, or perhaps a number of fundamental 'somethings', seems to have gone wrong. A review of several possible culprits for the UK economy's supply-side reverses is then offered. One source of weakness is uncontroversial, the depletion of the UK's oil and gas resources. Apart fr om that, the evidence suggests that the poor productivity figures of recent years are more likely to be attributable to mistakes in government policy than to private sector inadequacy of some sort.

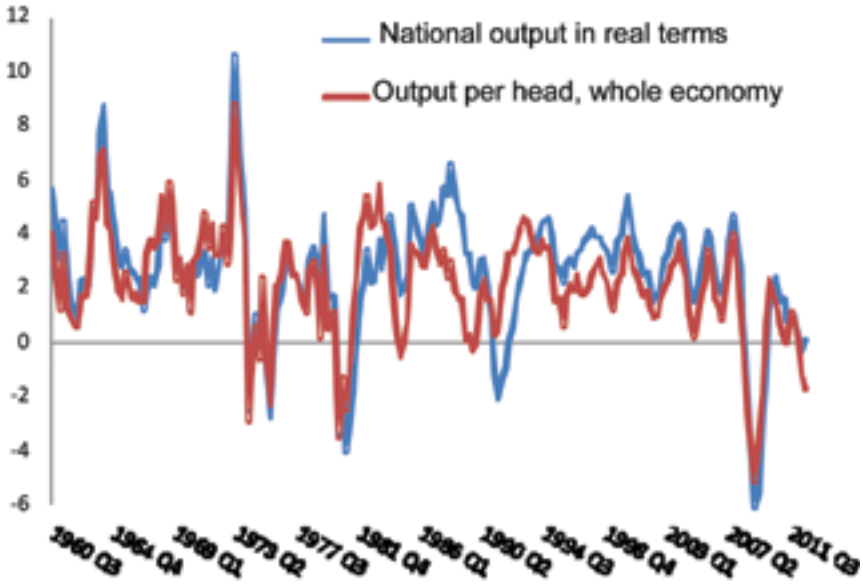
11 One of the earliest authors to notice this was Frank Paish of the London School of Economics, in the 1950s: see Paish (1962: 327). The idea then became basic to 'Okun's law', formulated by the influential American economist, Arthur Okun, as discussed in essay 6 in Congdon (2011).

12 A large literature on these matters has developed, but see, for example, Taylor (1974: 35–39).

Has recent productivity performance been worse than implied by the past output-productivity relationship?

As has just been noted, because employment tends to be more stable than output, the growth rates of output and productivity are correlated. Figure 3 shows the annual rates of change in national output and whole-economy output per head from 1960 and illustrates the point clearly. Given that output fell steeply in 2009 and still has not regained its earlier peak (in early 2008), it should come as no surprise that productivity growth has been beneath the average of recent decades. If the economy were behaving 'normally', the output-productivity correlation implies that poor output ought to be associated with poor productivity. Productivity performance can be condemned as 'underperforming' only if it has been worse than implied by the past output-productivity relationship.

Figure 3: Output-productivity relationship 1960-2012 (% changes, quarterly data



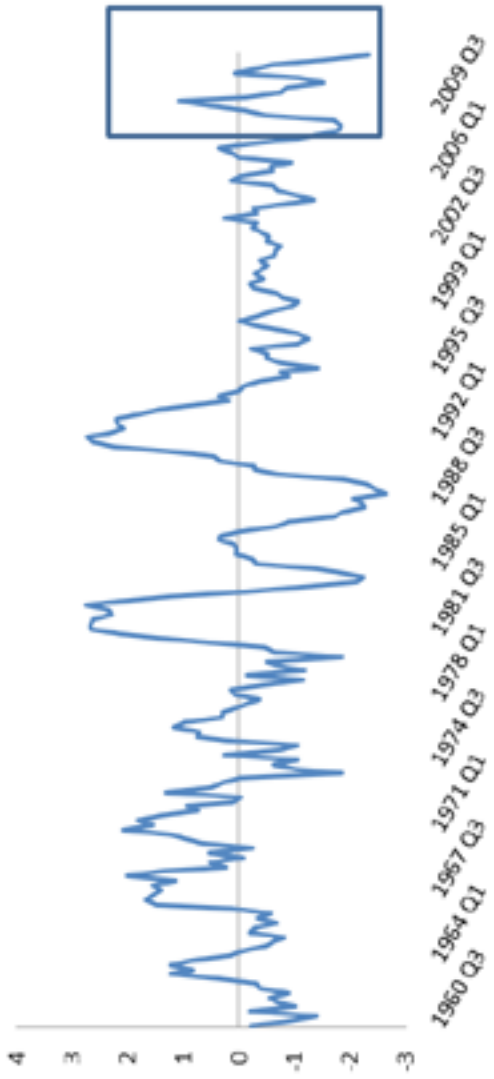
The output-productivity relationship over the period 1960 to 2007 was therefore estimated by standard statistical methods, deriving an equation that easily met the usual significance tests. [13] One way of assessing the post-2007 performance of productivity, relative to the economy's underlying long-run behaviour, was to see whether actual performance in 2008 and later was above or beneath the values implied by the pre-2008 equation. (The actual values of output were 'plugged into' the equation, which was extrapolated to the third quarter of 2012.) The result was that output in 2008 and later was appreciably lower than would have been expected if the pre-2008 output-productivity relationship had survived. Figure 4 shows the economy's over- and under-performance on productivity relative to the pre-2008 output/productivity relationship.[14] The last few years of the Great Recession – which are those inside the box with the extrapolated outcomes – are clearly among the worst in the entire period of over five decades. (Nevertheless, it is worth saying that, on this criterion of performance, the five years to the third quarter of 2012 are not noticeably worse than some other five-year periods, including some five-year periods in the 1980s, occasionally revered for its economic dynamism.)

Although future upward revisions to the official estimates of output in these years are possible, it is clear that productivity in the Great Recession has been subject to an abnormal check. In the five years to the end of 2012 the cumulative negative residual compared with the earlier relationship amounted to over 4 per cent of output. In other words, productivity growth had on average been unsatisfactory, compared with past norms, by almost 1 per cent a year for five years.

13 The equation was dP = 0.57 + 0.65 dY, with dP as the annual change in whole economy productivity and dY in national output, both in per cent. The r2 was 0.58, the t statistic on the regression coefficient was 15.9 and 3.9 on the intercept term, and the standard error of the equation was 1.16.

14 The sum of the residuals was zero for the 1960–2007 period, since performance was relative to an equation estimated over this period. The 2008 and later values were the difference between actual productivity changes and those obtained by extrapolating the 1960-2007 equation.

Figure 4: Over-performance and under-performance of UK productivity relative to historical relationship (1960-2007)[15]



15 Data are annual percentage changes, quarterly and relative to the equation in note 13. The boxed area relates to the recent period under discussion.

How is this shortfall to be explained? What influences might account for the weakness of the productivity numbers? Five suggestions are now offered, in no particular order. Of course, each of the candidate explanations is the more persuasive if it relates to an economic development specific to the last few years.

Explanation 1: depletion of North Sea oil and gas resources

Natural resource depletion is a fact of life. Typically the highest-return oilfields and mines are exploited first, with the result that later production requires more resources of labour and capital per unit of output (i.e., lower productivity) than earlier. As natural resources are depleted, the productivity of factors of production used in their extraction declines. In the case of the UK's offshore oil and gas industry, this consideration has affected the growth rate of whole-economy productivity to some extent. Also important is that labour productivity in the oil and gas sector is exceptionally high, because of the heavy capital expenditure (and high capital/labour ratio) involved in this form of energy production. As the sector declines in relative importance, whole-economy labour productivity is reduced.

The UK's offshore oil and gas production peaked in 1999. Since then national output, excluding oil and gas, has risen on average by 0.25 per cent a year a more than national output as a whole. Since employment in the sector is small, the depletion of the UK's oil and gas resources has lowered the rate of whole-economy productivity change by a similar figure, say, 0.2 per cent a year. This is part, if only a small part, of the explanation for the weakness of recent productivity outturns compared with the long-run average. But it must be noticed that this negative factor began almost 15 years ago, not at the start of the Great Recession.

Explanation 2: high levels of public expenditure

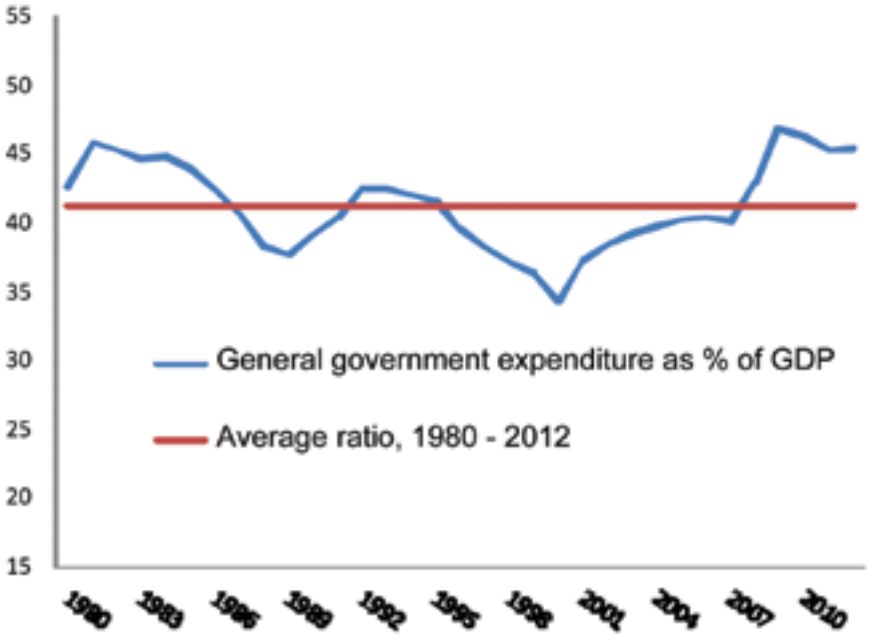
The significance of high levels of public expenditure and taxation for economic growth is much debated. Two adverse effects of a large state on productivity performance are commonly recognised. Firstly, many economists believe that the higher

are taxes, the weaker are the incentives to work and to save.[16] Secondly, because most of public expenditure is paid for by taxes, it is not subject to a market test and the motivations for enterprise found in the private sector do not apply (Bacon and Eltis, 1976). Productivity growth tends therefore to be lower in the public sector than in the private sector. (Over time the result is, of course, that the level of productivity in state-owned activities is lower than in comparable privately-owned activities, justifying the privatisation of the state-owned entities.)

As the Great Recession has been accompanied by a high ratio of public expenditure to national output, this aspect of the economic situation needs to be included in the discussion. But the subject is vast and space limited. Figure 5 shows that the ratio of general government expenditure to GDP has been about 45 per cent in recent years, almost 5 per cent above the 1980–2012 average, and well above the range of 35–40 per cent seen in the period of benign economic outcomes from 1992 to 2007 sometimes known as the 'Great Moderation'. Varying estimates have been made of the damage done to a nation's growth potential by excessive levels of taxation and public expenditure. But some negative effect, perhaps quite small at about 0.25 per cent a year, seems plausible from the over-expansion of the public sector during and since the Gordon Brown premiership.

16 For a sceptical view on the 'assured rhetoric of ultra-liberal conservatism' that high taxes are damaging, see Turner (2001: 250–252).

Figure 5: General government expenditure as share of GDP (%)[17]



17 Data annual, from IMF

Explanation 3: the cost of renewable energy

The European Union has accepted the so-called 'warmist' doctrine that, because of the carbon emissions arising from modern industrialism, mankind is largely to blame for the global warming of recent decades. The EU has therefore decided that its member states must take action to curb carbon emissions, even though such action leads to the replacement of low-cost fossil fuels by high-cost renewable energy and is plainly inefficient in economic terms. As an EU member, the UK has participated in the drive towards renewable energy. The three key directives here are the 2001 Large Combustion Plant Directive, the 2003 Biofuels Directive, and the 2009 Renewables Directive. The last of these is the most significant and undoubtedly the most costly. The purpose of the 2009 Renewables Directive is, explicitly, to move towards a 20 per cent drop in the EU's carbon emissions by raising the proportion of electricity generated EU-wide by renewables (wind, wave, solar and so on) to 20 per cent by 2020. The cost of electricity generation by means of renewable energy is much higher than that by conventional methods (gas and coal firing, mostly). For example, electricity from offshore wind farms costs at least three times as much to produce as electricity from a gas-fired combined-cycle power station.

This is not the place for a lengthy discussion of the environmental impact of carbon emissions. It may or may not be proved 20 or 30 years from now that global warming has been caused predominantly by mankind. Whatever the outcome of that debate, several nations are *not* making major adjustments today to their policies towards energy, electricity generation and the environment. In electricity generation they continue to invest in order to minimise cost. As a result, households and companies in every country in the EU – and not just the UK – will have to pay well above the international price for electricity. Industries heavily reliant on energy usage and electricity consumption will become too high-cost compared with suppliers from other countries. They will stop investing in the UK and other EU countries. As a news story in *The Sunday Times* on 6 February 2011 remarked: 'Leading chemical companies have warned the government that its energy policies will render them

uncompetitive, leaving plants to “die on the vine” to quit Britain for lower-cost countries.’[18]

Government departments have of course had to advise ministers on the costs of the UK’s adoption of the EU’s green agenda. *The Guardian* has received a series of leaks from sources in the Department for Business, Innovation and Skills (formerly the Department of Trade and Industry) on key energy policy issues that have been and remain in dispute. Some leaked documents indicated that the cost of meeting EU targets would be between £5 billion and £11 billion a year. Indeed, according to the documents, the long-term goal of 20 per cent of total energy being from renewables would cost £22 billion a year (Campbell-Bannerman, 2011: 30). Because the British government has, at the EU’s behest, imposed methods of electricity generation that are costly and inefficient, Britain is worse-off without qualification. An unfavourable effect on labour productivity is to be expected while the switch to renewable energy is taking place. (The selection of costly methods of electricity generation may eventually prove to have been correct, in that lower carbon emissions may help ‘to save the environment’. But – as of now – that is conjecture and irrelevant to our discussion which is designed to identify the source of the fall in productivity.)

The size of the adverse effect, in terms of the effect on the annual growth rate of productivity, is for debate. In 2010 the gross value added of the ‘electricity, gas, steam and air conditioning supply’ category in the national accounts was £18.9 billion, compared with the nation’s total gross value added of £1,265 billion. The EU-inspired drive to renewables may have reduced productivity growth by 0.1 per cent (or at most 0.2 per cent) a year while it has been (and continues to be) implemented. (Similar remarks might also be made about EU environmental legislation, with an apparent requirement for serious over-investment in water purity and hence in water supply infrastructure. Also detrimental to growth are a variety of EU directives on employment, but these have been taking effect for many years and it is unclear that the intensity of labour regulation increased from 2007.)

18 Danny Forston ‘Chemicals cry for help’, *The Sunday Times*, 6 February 2011.

Explanation 4: increased financial regulation and the City of London

The UK's financial sector has been heavily criticised as being in some sense culpable for the setbacks of the Great Recession. The popular media have highlighted the disparity between the high incomes earned by top executives in the banking industry and the poor returns for banks' shareholders and other stakeholders. In this context the UK's financial sector and 'the City of London' are often bracketed together. However, this overlooks that the particularly high incomes earned in the City result predominantly not from domestic UK banking, but from financial service exports to (mostly) large corporate clients around the world. During the Great Moderation the boom in these exports contributed disproportionately to UK GDP growth.

Some data on these patterns is given in Table 2. In 1992, the UK's exports of financial services were less than 1 per cent of GDP. Although they declined in 1992 itself, over the following 15 years they climbed at an annual compound rate of about 15 per cent. These gains reflected the application of new information technologies, which facilitated greatly increased trading volumes, and globalisation, as well as a range of financial innovations. (They had relatively little to do with the booms in mortgage and other types of personal credit in UK domestic banking in the opening years of the 21st century.) In 2008, financial service exports amounted to over 3.5 per cent of GDP, implying that this one part of the economy – to repeat, a mere 0.9 per cent of the economy in 1992 – contributed about 0.25 per cent a year to aggregate growth during the Great Moderation.

Table 2: The boom in UK financial service exports, 1992–2008

Year	Value of financial service exports (£m)	Annual change in financial service exports %	Annual change in real GDP %	Ratio of financial service exports to GDP
1992	5,605	-12.3	0.9	0.9
1993	6,885	22.8	3.1	1.0
1994	8,190	19.0	4.6	1.2
1995	9,259	13.1	3.2	1.2
1996	12,112	30.8	3.1	1.5
1997	13,846	14.3	3.9	1.7
1998	11,884	-14.2	3.5	1.3
1999	15,118	27.2	3.2	1.6
2000	16,940	12.1	4.2	1.7
2001	19,478	15.0	2.9	1.9
2002	20,040	2.9	2.4	1.9
2003	22,888	14.2	3.8	2.0
2004	25,226	10.2	2.9	2.1
2005	28,369	12.5	2.8	2.2
2006	34,202	20.6	2.6	2.6
2007	44,694	30.7	3.6	3.2
2008	52,712	17.9	-1.0	3.7
Average annual % growth rate of financial services exports 1992-2008				13.9
Average annual % growth rate of real GDP 1992-2008				2.9
Compound annual % growth rate of financial services exports 1992-2008				13.2

Source: Office for National Statistics and author's calculations.

Since 2008 the growth has stopped, as is shown in Figure 6. The growth may merely have paused, reflecting the hostile environment of the Great Recession, or it may be attributable to the frustration of the fundamental growth drivers. The imposition of a stricter regulatory framework is an obvious barrier to resumed growth in the financial sector in the advanced countries at present. The new regulations are being applied at the national level, but they stem from international agreements (on, for example, banks' capital/asset ratios) reached under the aegis of several supranational bodies, but most notably that of the Bank for International Settlements (BIS) in Basel. In countries outside the BIS orbit the financial sector continues to grow rapidly. At any rate, as far as the UK is concerned, the loss of dynamism in financial exports is one reason – accounting for perhaps 0.25 per cent a year – that recent productivity growth has been disappointing. (Nothing is said in detail here about a further possible effect of tighter financial regulation. It is clear that, if the target rate of return on equity is given, banks must respond to an increase in the regulatory capital/assets ratio by widening loan margins. That increases the cost of finance to the corporate sector and reduces the range of capital projects that is economically viable, with an unfavourable effect on labour productivity. An effect of this sort may be a contributory factor in the UK's current weak productivity performance, but full substantiation of the argument is not provided here.)

Figure 6: UK exports of financial services over 25 years to 2012 (£m per annum)

Explanation 5: low productivity of immigrant workers

It was noted earlier that, during the Great Recession, employment was surprisingly resilient, given the severity of the fall in output. However, a distinction needs to be drawn between UK-born and foreign-born workers. The years since the 2004, which saw the accession of eight Central and Eastern European countries to the EU, have been marked by heavy immigration into the UK of foreign people of working age. In this period about half of the immigration has been from the eight Central and Eastern European countries ('the EU-8').

Despite some scare stories in the popular press about 'benefit tourism', most of the immigrants came to work and found jobs. The result during the Great Recession was a sharp dichotomy in the employment patterns of UK and non-UK-born people. At the end of 2007 total employment was just under 29.5 million, split between UK-born of 25.9 million (87.7 per cent of the total) and foreign-born of 3.6 million (12.3 per cent). Over the next four years, UK-born employment dropped to 25.0 million (85.8 per cent), whereas foreign-born employment went up to 4.1 million (14.2 per cent). Although a case can be made that the immigrant workers took jobs away from those with long-standing UK connections and in that sense were better-qualified than the UK-born in the activities where they concentrated, there is little doubt that these activities were and remain typically low-income and low-productivity.[19] An examination of 2007–09 employment records by an official statistician concluded, 'EU-8 workers are predominantly employed in "Elementary occupations"' (Coleman, 2010: 7). In this four-year period the balance between UK- and foreign-born in the UK labour force therefore changed by 2 per cent. Meanwhile the average productivity of the new foreign-born workers was lower than that of the workforce as a whole. If it were assumed that the productivity of the newly employed foreign workers was two-thirds of the existing workforce, this development would explain a drop in the *level* of productivity of between 0.5 and 0.75 per cent. Given that it occurred over a four-year period, the negative impact on the annual *growth rate* of productivity was between 0.1 and 0.2 per cent.

19 The author analysed the effect of EU8 immigration on the UK labour market in chapter 4 of Congdon (2012).

It should be noted that the fact that migration might have contributed to a fall in productivity does not mean that migration is a bad thing – as with climate change, that argument is simply not discussed here. It is possible that migrants will raise their own productivity by coming to a country such as the UK whilst lowering the average productivity of the country to which they migrate. It is also possible that both the migrants and the indigenous population may be better off. The purpose of this paper is merely to identify the impact on productivity.

Conclusion: the productivity check to be blamed on government policies, not private sector failure

The discussion here may not seem to have a salient unifying theme. It has been shown that the UK's productivity performance during and immediately after the Great Recession has been mediocre, even when allowance is made for the well-established cyclical correlation between changes in output and productivity. Relative to what might be termed 'reasonable expectations' given the output-productivity correlation observed in the past, the shortfall has been almost 1 per cent per year. The weak numbers have been blamed here on five influences, and these influences appear miscellaneous, *ad hoc* and unconnected. For example, the effect of new regulatory constraints on the high-productivity cluster of City-of-London-based industries is quite separate from the impact of low-productivity immigrants on aggregate productivity. However, it could be claimed that four of the five influences reflect official policy in some way, and that only one – the depletion of the UK's North Sea oil and gas resources – is unrelated to policy. Indeed, three of the remaining four influences (i.e., the move to renewable energy, the adoption of tighter regulatory standards in the financial system and immigration from Central and Eastern Europe) arise to some degree from the UK's membership of the EU. Perhaps it is not surprising that disquiet is being expressed about the cost-benefit implications of the UK's continued participation in 'the European construction', with the Foreign and Commonwealth Office now conducting a review of the 'competences' granted to the EU.

As recognised in the discussion above, the effect of a large state sector and high taxation on economic growth is controversial. All the same, the expansion of government spending in the second half of the 1997–2010 Labour administration was of course the result of decisions taken by politicians, not of business people in the private sector. To the extent that higher taxes have hurt the economy, here too the fault lies with politicians and officialdom, not with a failure of enterprise and the private sector. The table below brings together the strands of argument in this paper, providing an apparently quite effective interpretation of the check to UK productivity in the Great Recession. A warning has to be given that economists are bad at understanding the causative forces at work in economic growth and the neatness of the 'explanation' should not be pressed too far.

Table 3: An explanation of the productivity check in the UK's Great Recession

Influence at work	Negative effect on productivity growth in the Great Recession relative to the Great Moderation - % of national productivity level
Depletion of North Sea Oil and gas	0.1-0.3
Adverse effects of high taxation due to large state sector	0.2-0.3
The cost of drive to renewable energy	0.1-0.2
End of financial services export boom	0.2-0.3
Low productivity of immigrant workers	0.1-0.2
Total negative effect of all five influences	**0.7-1.3**

In the so-called 'tech bubble' of the late 1990s some commentators spoke of a New Era of much-enhanced productivity gains.[20] Given the excitement and hopes generated by the revolutionary Internet-based technologies, the setbacks of the Great Recession are doubly disappointing. But the new technologies did contribute, for example, to the remarkable dynamism of the UK's financial sector in the Great Moderation. Huge scope remains for their application in the media and publishing industries, in which the UK ought to do well because of its central position in the English-speaking world. The Great Recession has been characterised by both increased regulation and stagnant productivity. Sooner or later the arguments for deregulation will again be articulated and translated into policy. Might higher and historically more normal rates of productivity growth then resume?

20 'New Era' talk is often attributed to Alan Greenspan, chairman of the USA's Federal Reserve from 1987 to 2006. In fact, in a 1999 speech he repudiated the 'New Era' phrase, while agreeing with the notion of 'a structural shift' in the underlying rate of productivity growth. To quote, 'I do not say we are in a new era, because I have experienced too many alleged new eras in my lifetime that have come and gone. We are far more likely, instead, to be experiencing a structural shift similar to those that have visited our economy from time to time in the past.' The quotation is from 'Remarks by Chairman Alan Greenspan: the American economy in a world context', given at the 35th annual conference on 'Bank Structure and Competition' of the Federal Reserve Bank of Chicago, Chicago, Illinois, on 6 May 1999.

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What is the UK's sustainable rate of economic growth?

by Peter Warburton, Robert Sierra, Joanna Davies and Haroon Fatih

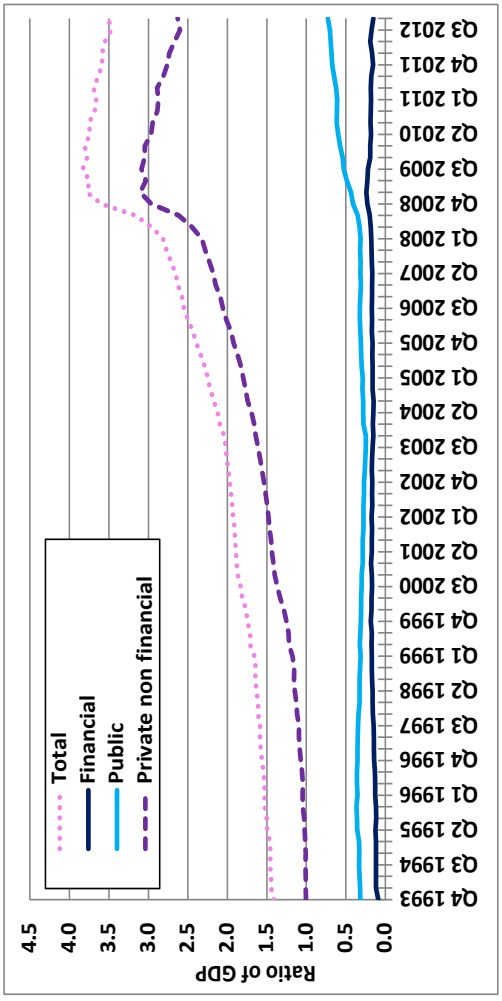
Introduction

In the ten years between quarter two 1997 and quarter two 2007, the UK economy achieved an average compound growth rate of 3.2 per cent per annum. More than five years later, a return to the strength and consistency of that performance seems very distant. Attempts to rationalise the depth of the slump and the limpness of the subsequent recovery using conventional growth arithmetic have proved woefully inadequate. In conventional, New Keynesian economics, only real factors – such as the inputs of labour and capital – determine real output. In the light of the global credit and financial crisis of 2007-2009, there has been a belated recognition that debt, a financial variable, can have effects on real variables, such as output and employment. In 'The real effects of debt', Cecchetti et al. (2011) demonstrate beyond all reasonable doubt that, above certain debt-income thresholds, debt transforms from being growth-enhancing to growth-detracting.

The authors estimate that this debt ratio threshold is around 90 per cent for the non-financial corporate sector, about 85 per cent for the household sector and also 85 per cent for government. Taking a combined ratio for the non-financial private sector of 175 per cent of GDP as the threshold, Figure 7 makes plain that the UK crossed this threshold around the year 2000 and kept on

going. When the crisis broke, in summer 2007, the ratio was 218 per cent. At the height of the crisis, in early 2009, a peak of 310 per cent was reached. Public sector gross debt to GDP was 44 per cent on the eve of the Lehman collapse and has since risen to 87 per cent, excluding financial interventions. In the course of softening the impact of the private sector credit crisis, the public sector may have exhausted its own debt capacity.

Figure 7: UK Debt-GDP ratios for selected sectors



Source: IMF, BIS and ONS

The contention of this paper is that the role of credit, in its broadest sense, offers the fundamental insight into the UK economic predicament. What brought the UK economy, among many others, to its knees in 2007 was the fracturing of the global credit system, beginning with Bear Stearns and Northern Rock and culminating in the collapse of Lehman Brothers and the dramatic public recapitalisation of Lloyds and the Royal Bank of Scotland. The shocking manner in which the economic recovery has petered out since the summer of 2010 underlines the centrality of the role of credit in healthy economic development.

Another aspect of the growth discussion in the UK concerns the attainability of the pre-slump peaks in some particular sectors. To the extent that easy access to cheap credit fostered the creation of excess capacity in the construction, real estate development,distributive and financial services sectors, for example, not only was their growth rate unsustainable but their peak level of activity was also artificial. Post-slump, the viable economic size of these industries may remain below their prior peaks for an indefinite period. The instinctive desire to reclaim the economic heights of late-2007 or early-2008 may not be consistent with the return to a sustainable path of economic development. In these circumstances, another fiscal boost to aggregate demand, as some advocate, would deliver inflation rather than increased real activity.

The rolling back of government activity and influence, the regeneration of affordable credit channels to unencumbered households and businesses, and the implementation of bold supply-side measures will all be required if the UK is to claw its way back to 2 per cent medium-term growth. After examining the detailed behaviour of the economy since the early 2000s, using decomposition into 44 sub-sectors, our conclusion is that the annual rate of sustainable economic growth currently lies in the region of 1 per cent. Forests may have an organic growth rate of their biomass but economies do not; facing the challenge of a competitive global economy with a debt hangover, some countries will experience stagnation or decline in real incomes. The UK economy will only avoid this fate if credit disciplines improve, allowing credit constraints to be eased.

The following sections set out the hypothesis that the rapid growth rate attained by the UK economy between 1997 and 2007 was

largely attributable to the secular increase in the debt-income ratio of households and non-financial corporations. Using the concept of the external finance premium, we argue that a distortion in credit pricing was responsible for the most extreme phase of this increase in debt absorption. By comparing the real growth rates of bank credit for various industrial sectors to their respective real output growth rates, we connect the thesis of excessive debt absorption to the acceleration of economic growth. A detailed disaggregation of UK output enables the identification of four typical shapes of output evolution since 1997. The most common shape, shared by sectors accounting for 56 per cent of economic output, shows a post-slump growth rate that is less than half the growth rate achieved between 2002 and 2007. A final section draws together the analysis and estimates the current sustainable growth rate of the UK economy.

The growth arithmetic approach and its drawbacks

The decade, from 1997 to 2007, of Non-Inflationary Consistent Expansion of real output inspired Sir Mervyn King's 'NICE' acronym. Under Gordon Brown's tutelage, a small army of government economists was at work, dissecting the ingredients of economic growth and devising strategies for raising total factor productivity (TFP). This approach, known as 'growth arithmetic', is illustrated in Table 4 and is extracted from the last *Red Book* of the outgoing Labour government. The significance of this approach, derived from the notion of a production function, is that the pace of potential economic growth is determined from the growth rates of labour and physical capital inputs and a proxy variable for the contribution from technological and organisational improvements. The fancy term for this latter effect is 'disembodied technical progress'.

The key insight, for our purposes, is that Gordon Brown's Treasury appears to have believed that the expansion of the economy during the NICE decade was sustainable and justifiable in terms of the growth arithmetic. The Treasury projected an annual GDP growth rate of 2.75 per cent in the medium term. Plainly, they were not expecting the output discontinuity that occurred in conjunction with the global financial crisis. Had UK economic activity continued to expand at its 10-year pre-slump compound rate of 3.2 per cent per annum, the level of output would be approximately 15 per cent greater than it is today.

Table 4: Estimated contributions to trend rates of output growth, per cent per annum

	Trend output per hour worked		Trend average hours worked	Trend employment rate	Population	Trend output
	Underlying	Unadjusted				
1986 Q2 to 1997 H1	2.13	1.95	-0.11	0.36	0.26	2.47
1997 H1 to 2001 Q3	3.12	2.88	-0.46	0.50	0.52	3.45
2001 Q3 to 2006 H2	2.21	2.16	-0.24	0.10	0.76	2.80
2006 H2 onwards (projections)	2.23	2.30	-0.20	-0.15	0.80	2.75

Source: HM Treasury, Financial Statement and Budget Report, Table B.2, March 201

The financial crisis and subsequent stagnation have underlined the crucial role of credit to the proper-functioning of the modern economy. In the study of economics, prosperity and growth is created by 'real' factors such as productivity of the workforce, the quantity and quality of the capital stock, the availability of land and natural resources, technical knowledge and the skills of the entrepreneur. Practical experience also recognises the fundamental supporting role that financial factors play in an economy. An entrepreneur seeking to bring a product or service innovation to the marketplace may need access to external sources of financial capital, via a bank or a venture capitalist.

While large and established businesses typically finance the bulk of their replacement and new fixed capital formation from retained profits and other internal sources, new businesses and projects with very large capital requirements must turn to external finance sources. When large corporations embark on a strategy of credit-fuelled growth, either organically or through acquisition, it is often an indication that external finance has become unusually inexpensive. Similarly, when private equity houses are able to borrow sufficiently to finance the purchase of household-name businesses, this is perhaps a sign that credit conditions have become too slack.

Policymakers have traditionally highlighted the importance of these financial factors in shaping the business cycle: the possible interactions between credit markets and the real economy are a customary part of the overall assessment of the policy stance. However, despite its acknowledged relevance for policy making, until recently most economic models employed in academia and policy institutions contained only cursory linkages between credit markets and the rest of the economy.

A seminal paper by Bernanke and Gertler (1995) showed how the effects of a real shock (such as a shock to productivity) on financial conditions could lead to persistent fluctuations in the economy, even if the initiating shock had little persistence. Work by Bernanke et al. (1999) and Iacoviello (2005) introduced credit and collateral requirements in economic models as a suggested way of remedying this deficiency. More recent models have begun to study the role of financial intermediaries (Christiano et al., 2008; Goodfriend and McCallum, 2007).

A key concept in their analysis is the external finance premium. This is the difference between the cost of capital available internally to firms (i.e. retained earnings) and the cost of raising capital externally via equity and debt markets. Externally raised funds are virtually always more expensive than internally generated cash flows because of the costs that outside lenders bear in evaluating borrowers' prospects and in the monitoring of their actions. As such, the external finance premium is generally positive. Greenwald and Stiglitz (1993) show that the external finance premium that a borrower must pay should depend inversely on the strength of the borrower's financial position, measured in terms of factors such as net worth, liquidity and cash flows.

The most persuasive explanation for costly external finance is the existence of asymmetric information, which gives rise to financial market imperfections, according to De Graeve (2007). Kiyotaki and Moore (1997) assert that a borrower in a financially strong position has greater incentives to make well informed investment choices. When the borrower has a significant stake in his or her enterprise, the lender has lower monitoring and evaluation costs and such borrowers generally pay a lower premium for external finance. While the concept of the external finance premium is unobservable, some authors use the difference between Moody's Aaa and Baa rated long maturity corporate bond rates as a proxy.

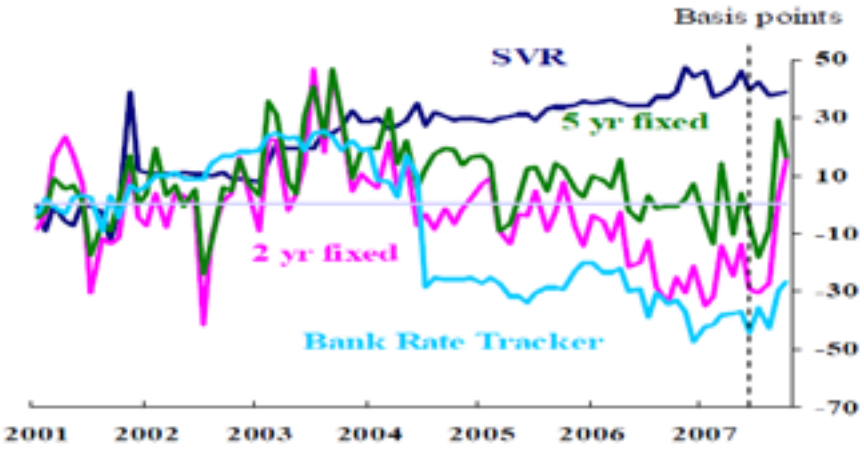
The legacy of mispriced credit risk

How and why did UK credit disciplines deteriorate during this long interval of economic expansion? The key elements of the explanation are as follows:

- The assignation of short-term interest rates exclusively to an inflation objective in 1997 opened the door to over-easy domestic credit conditions and a progressive erosion of the real returns to liquid forms of saving.
- The division of financial supervision responsibilities between the Bank of England, the Treasury and the Financial Services Authority turned out to be a recipe for negligence, not vigilance.

- Financial regulators, particularly the FSA, failed to spot the systemic risks associated with the switch from a deposit-funded UK mortgage market to a market-financed mortgage market. They also turned a blind eye to self-certification mortgages for which the true income multiple of a mortgage was often five or six, rather than the previously typical three.
- Regulators also failed to appreciate the significance of residential mortgages and commercial loans being priced below LIBOR. With a negative spread, the banks were cross-subsidising these loans from fee-based activities in a flourishing capital market. This development links directly to the discussion of the external finance premium above. Figure 8 signifies a compression of the external finance premium that triggered an acceleration in private sector borrowing.
- None of the aforesaid financial authorities seemed unduly troubled when the annual pace of credit growth accelerated in 2003-04. Nor when the industrial analysis of bank lending showed an increasing concentration in the hands of financial intermediaries other than life insurance and pension funds. Special purpose vehicles and other financial auxiliaries obscured the economic destination of the funds.
- Government economists came to regard the extraordinarily consistent period of economic growth from 1997 as delivering a ‘peace dividend’ in terms of the market risk premium. As a result, they argued, real interest rates would be permanently lower and house price-to-income ratios, permanently higher.

Figure 8: Mortgage borrowing spreads over LIBOR



Source: Besley (2008)

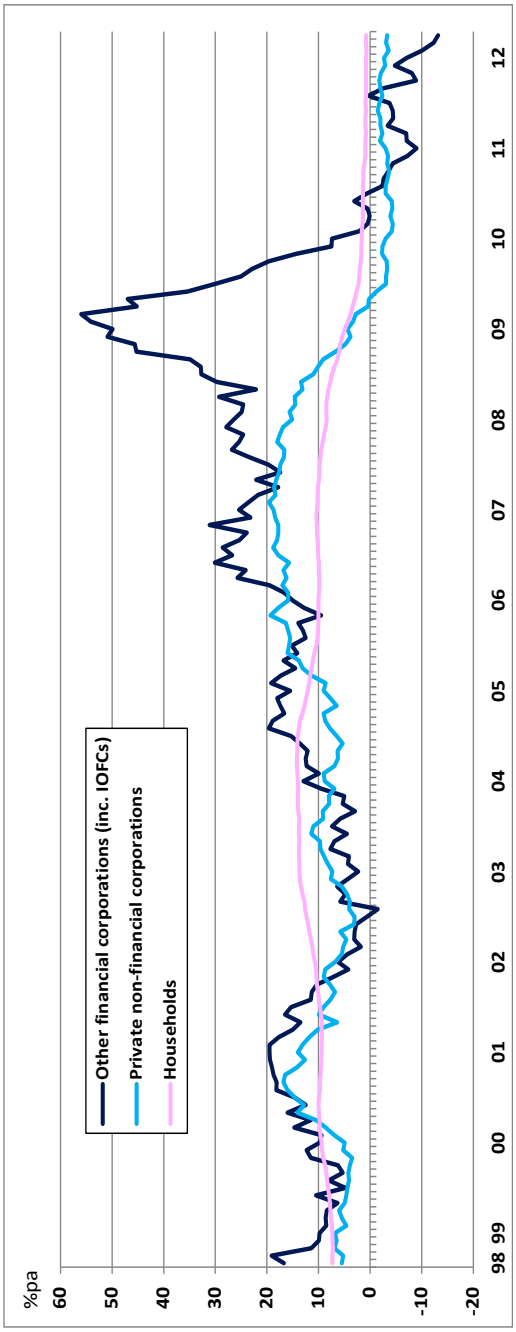
While the crisis in wholesale funding erupted in the USA, the UK was ripe with excesses and contradictions of its own. Remember that Northern Rock blew up in August 2007, more than a year before Lehman Brothers' collapse. The seeds of the UK's economic demise were sown extensively during the interval 2004-07, when complacency set in and leverage went wild. Over a much longer period, the systemic leverage of the private sector economy had been increasing but there was a quickening of pace leading up to the denouement in 2007. Essentially, economic growth had been supplemented by the financing of current spending from the loading of additional debt service charges into the indefinite future. Debt burdens, for example of young householders, appeared manageable only in the context of buoyant employment conditions, rising house prices and low interest rates based on a mispricing of credit risk.

Industrial analysis of monetary financial institutions lending to UK residents

The evidence for the thesis of excess credit growth, in combination with mispriced credit risk and inappropriately relaxed monetary policy, rests in the evolution of the UK's broad credit aggregates

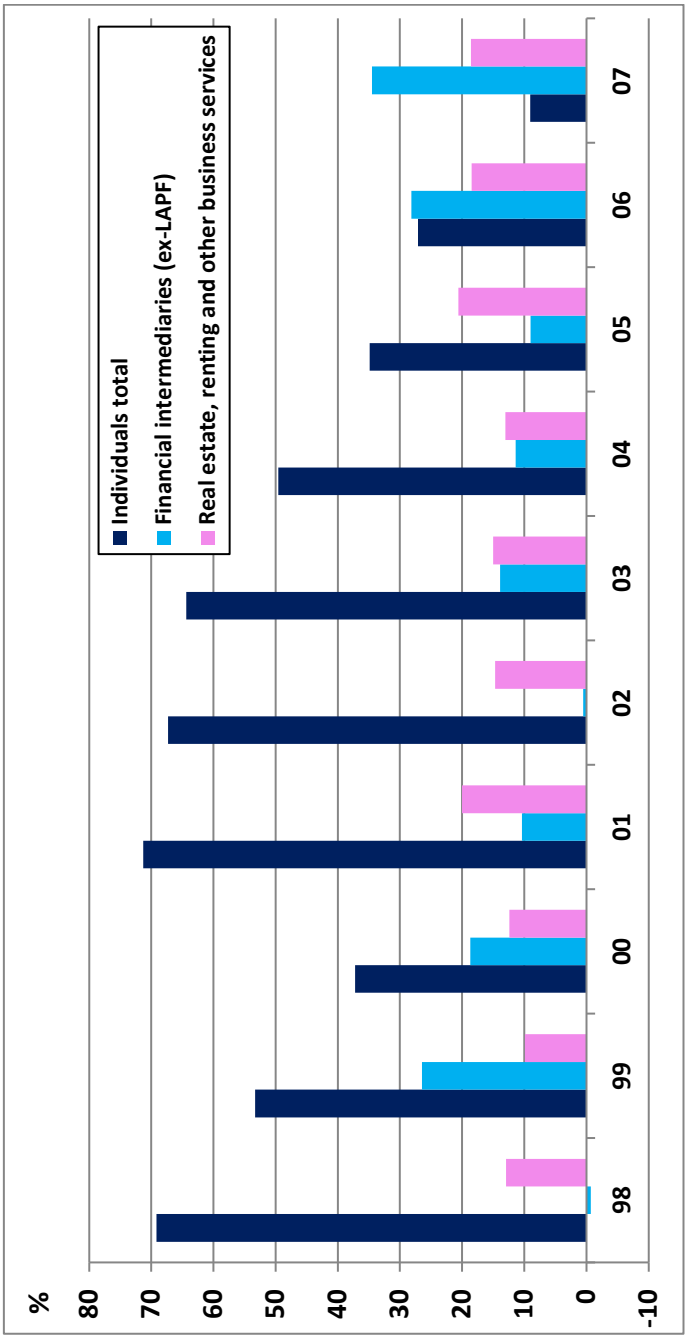
(Figure 9) and in the increasing polarisation of bank credit illustrated in Figure 10. Credit acceleration was deemed by the Bank of England to pose no particular danger to economic or financial stability because inflation was low and inflation expectations were well-anchored. Although the mortgage boom was receding by 2004 (other than the buy-to-let segment), loan growth to financial, real estate, renting and other business services did not peak until 2008. The unavailability of wholesale market finance after 2007 led to a further accumulation of bank and building society debt, especially by intermediate financial institutions. These excesses marked out financial services as one of those most chronically affected by the increase in credit costs and reduction in availability.

Figure 9: UK bank and building society lending growth by category



Source: Bank of England

Figure 10: Distribution of Sterling lending by selected sector



Source: Bank of England

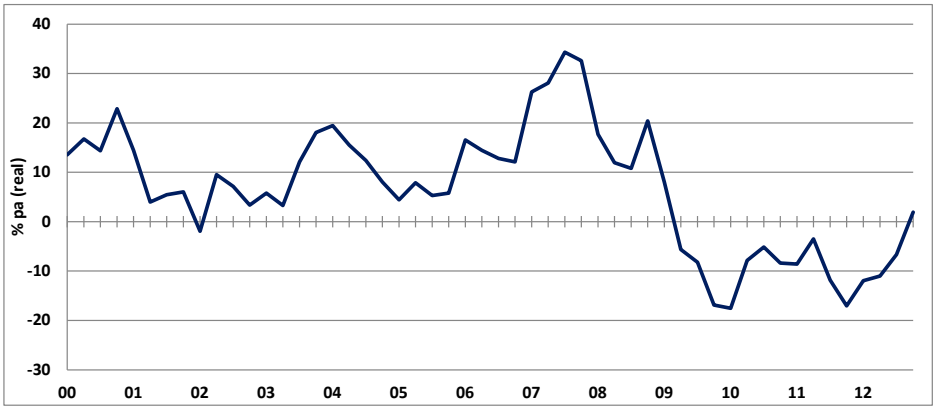
Using Bank of England data on monetary financial institutions' (MFI) lending to UK industries, we can identify the sectors that accumulated debt to drive output acceleration, implying that external finance was used to bring forward the expansion of capacity.[21] Once the financial crisis struck, credit re-priced and banks tightened lending conditions, denying the opportunity for credit-driven capacity expansion.

Perhaps the most glaring examples of credit abuse were in the financial services sector, where output slowed from a pre-crisis compound annual growth rate of 8.1 per cent between quarter four 2002 and quarter four 2007, to -3.9 per cent between quarter two 2009 and quarter three 2012. Over the same time period, bank lending to the financial sector expanded by an astonishing 18 per cent per year (see Figure 11) and has since contracted by 5.7 per cent. More recently, financial sector de-leveraging has shown signs of drawing to a close, with the stock of bank credit climbing 1.9 per cent in the year to quarter four 2012.

Output of the UK's construction industry is indisputably linked to credit, both directly (in terms of project finance) and indirectly (via customer demand for real estate and commercial buildings). Figure 12 shows the quarterly change in bank lending to the construction sector. The contraction in credit since 2009 has been accompanied by a compound 0.3 per cent drop in output. This compares with a pre-crisis compound annual growth rate of 1.4 per cent.

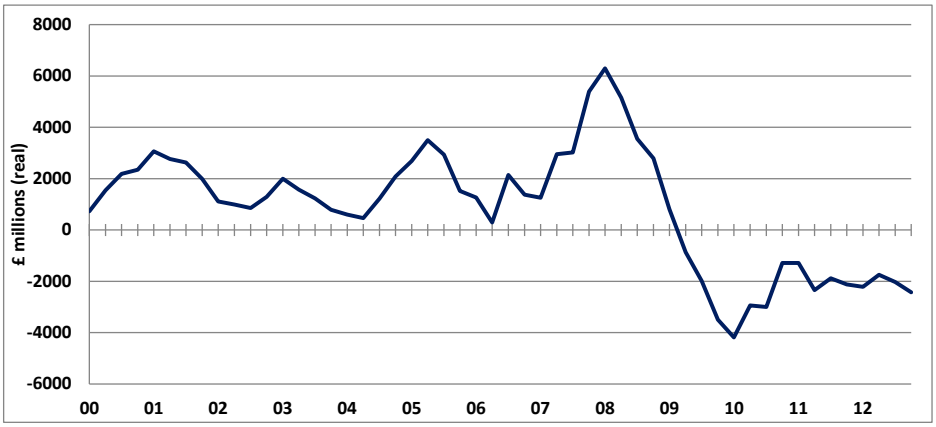
21 Although the official decomposition of output and bank lending industries differs, enough comparisons exist to form a solid analysis. Where possible, we have analysed the growth of outstanding debt but due to data breaks and other inconsistencies we have also referred to net lending, from which these distortions are absent.

Figure 11: Real monetary financial institutions' lending to the financial sector (using the GDP deflator, amount outstanding)



Source: Bank of England

Figure 12: Real net monetary financial institutions' lending to the construction sector (using the GDP deflator, four quarters rolling sum)

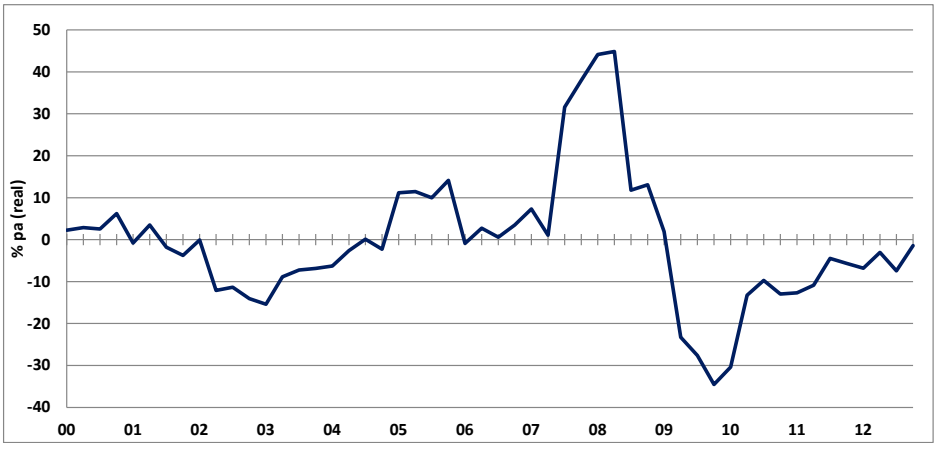


Source: Bank of England

The wholesale trades and real estate service sectors provide other clear examples of industries that have struggled to restore output growth to pre-crisis levels but are now expanding. Figures 13 and 14 confirm that bank finance played a vital role during the boom years but has since been in decline, with the stock of debt falling for the past four consecutive years. Although the extreme growth rates for both series in quarter one 2008 reflect data-breaks, when building societies were incorporated into the aggregate measure, there is abundant evidence of rapid credit growth. In an environment of more keenly priced and restricted credit, the artificial growth rates of pre-2007 remain unattainable.

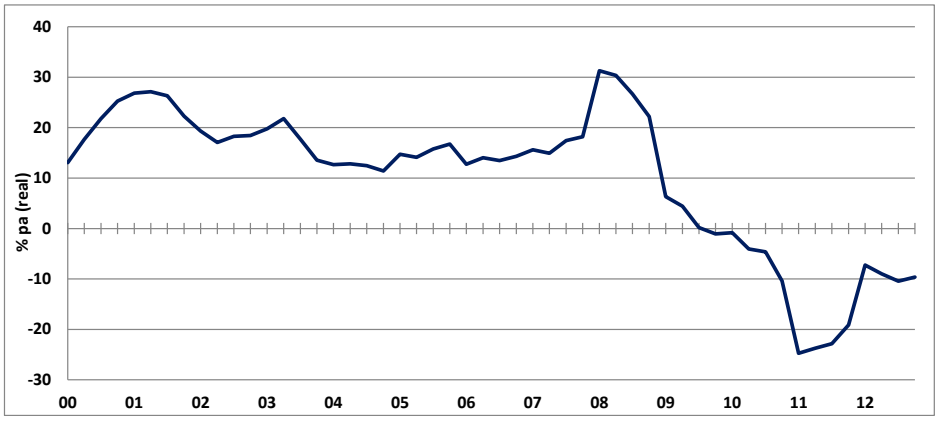
By way of contrast, an example of an industry that encountered a relatively short-lived and mild unwinding of credit is the accommodation sector. Thanks to a comparatively brief and modest contraction in the stock of bank credit (Figure 15) positive output growth recommenced within two years of the crisis and is now expanding at a faster pace than its pre-crisis compound rate of 3.4 per cent.

Figure 13: Real monetary financial institutions' lending to the wholesale trade, excluding motor vehicles and motor-cycles, industry (using the GDP deflator, amount outstanding)



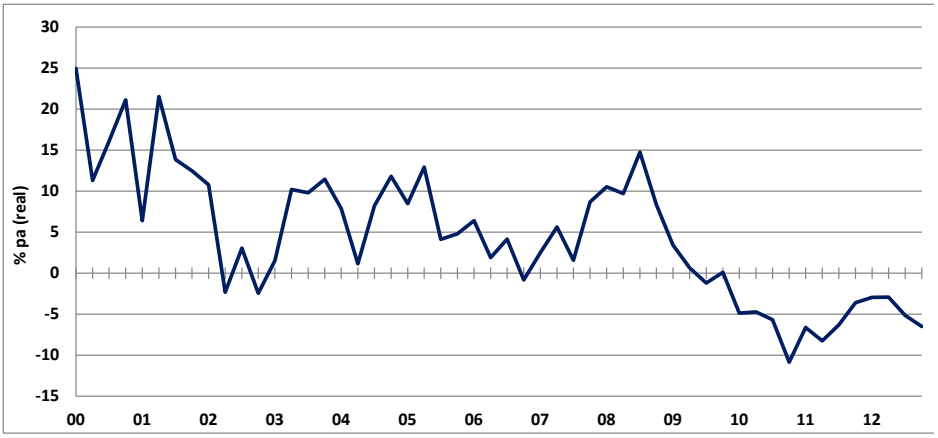
Source: Bank of England

Figure 14: Real monetary financial institutions' lending to companies undertaking buying, selling and renting real estate (using the GDP deflator, amount outstanding)



Source: Bank of England

Figure 15: Monetary financial institutions' lending to accommodation and food industries (using the GDP deflator, amount outstanding)



Source: Bank of England

In summary, sectors with the greatest dependency on bank finance, illustrated by a rapid accumulation of debt in the run up to the financial crisis, are typified by weaker post-crisis output growth as a consequence of credit tightening. There are, of course, exceptions to the rule. Several industries, such as postal and courier activities, have been in structural decline independent of credit restrictions and other sectors have successfully raised alternative forms of finance. This has enabled them to resume positive output growth in spite of declining bank credit. Notably, outstanding UK corporate sector bond debt has increased by more than 30 per cent since the first quarter of 2007.

The following section disaggregates UK economic output into its constituent parts, identifying post-crisis trends and assigning them to one of four groupings.

Sectoral disaggregation of the UK economy

The disaggregation of total output into its constituent parts enables us to identify common sectoral output patterns before, during and after the 2007-09 slump. Total output has been split into 44 categories, which comprise 16 from the industrial sector, 26 in services and one each for agriculture and construction. The service sector constitutes 77 per cent of output in the economy, industrial production 15.6 per cent (of which manufacturing is two thirds), construction 6.8 per cent and agriculture 0.6 per cent.

For ease of analysis, we have chosen a standardised chronology: we define the peak in output for all sectors to be quarter four 2007 and the trough as quarter two 2009 enabling us to compare the recovery rate of output from the trough. This standardisation of the peak and trough, however, is not without its difficulties given that some sectors, for instance air transport, had not fully troughed by quarter two 2009.

Table 5 shows the extent of the recovery across each of the 44 categories. The final column reveals that the service sector in aggregate has fully recouped the output lost during the slump. In contrast, the agricultural sector has seen output continue to decline since 2009. Industrial sector output has also declined modestly.

Within the latter category it should be noted that manufacturing output has retraced 33 per cent of its peak-to-trough decline.

At the other end of the spectrum, the mining and quarrying sector appears to be in structural decline. The explanation lies in the depletion of the UK offshore oil and gas resources, a loss of competitive advantage of UK coal mines and evolving patterns of energy consumption. Four more sectors, namely the manufacturing of computer electronics, coke and refined petroleum products, wood and paper products, and postal and courier activities, have all failed to recover in the post-trough period. The latter's peak was arguably in 2004 with output volumes steadily declining thereafter.

Table 5: Sectoral growth rates pre and post financial crisis

	Weights	Pre peak compound annual growth rate (2002 Q4 to 2007 Q4)	P com growt t
GVA balanced at basic prices		3.1	
Agriculture	**6**	**0.2**	
Industrial production	**156**	**0.2**	
Mining and quarrying	***24***	**-6.6**	
Manufacturing	**104**	**1.1**	
Manufacture of food products beverages and tobacco	19	0.0	
Manufacture of textiles wearing apparel and leather products	3	-2.0	
Manufacture of wood and paper products and printing	9	-0.2	
Manufacture of coke and refined petroleum product	1	-1.6	
Manufacture of chemicals and chemical products	10	1.4	
Manufacture of basic pharmaceutical products & pharmaceutical preparations	10	3.2	
Manufacture of rubberplastics prods & other non-metallic mineral products	7	1.6	
Manufacture of basic metals and metal products	13	2.1	
Manufacturing of computer electronic & optical products	7	-1.4	
Manufacture of electrical equipment	3	1.3	
Manufacture of machinery and equipment n.e.c.	7	3.2	
Manufacture of transport equipment	9	2.7	
Other manufacturing and repair	7	1.3	
Electricity gas steam and air conditioning supply	***15***	**0.8**	
Water supply; sewerage waste management & remediation activities	**12**	**1.9**	
Construction	**68**	**1.4**	
Services	**770**	**4.0**	
Distribution, hotels and restaurants	**140**	**3.1**	
Wholesale and retail trade; repair of motor vehicles and motorcycles	18	2.3	
Wholesale trade except of motor vehicles and motorcycles	41	3.2	
Retail trade except of motor vehicles and motorcycles	53	3.3	
Accomodation	8	3.4	
Food and beverage service activities	21	3.1	
Transport and storage, information and communications	***106***	**4.0**	
Land transport and transport via pipelines	18	2.8	
Air transport	5	6.8	
Warehousing and support activities for transportation	14	4.5	
Postal and courier activities	7	-8.2	
Publishing audiovisual and broadcasting activities	16	0.3	
Telecommunications	18	7.4	
Computer programming consultancy and related activities	22	8.3	
Information service activities	3	5.1	
Transport and storage, information and communications residual	3	5.3	
Business services and finance	***290***	**6.0**	
Financial service activities except insurance and pension funding	73	8.1	
Real estate activities	71	3.2	
Legal, accountancy, management, architecture, engineering technology testing activities	54	10.2	
Other professional, scientific and technical activities	15	2.7	
Administrative and support service activities	44	6.6	
Business services and finance residual	34	1.7	
Government and other services	***233***	**2.1**	
Public administration and defence; compulsory social security	54	1.0	
Education	68	0.9	
Human health and social work activities	79	4.2	
Arts entertainment and recreation	15	3.3	
Other service activities	14	1.1	
Activities of households as employers of domestic personnel	4	-1.8	
NB: weights may not add up due to rounding			

Post trough pound annual th rate (2009 Q2 to 2012 Q3)	Percentage change from peak (2007 Q4) to trough (2009 Q2)	Percentage change from trough (2009 Q2) to current (2012 Q3)
1.1	-6.1	55.4
-1.4	**-3.8**	**n/m**
-0.3	**-11.3**	**n/m**
-9.5	**-10.6**	**n/m**
1.4	**-12.1**	**32.9**
2.0	-3.5	182.0
0.3	-10.3	7.9
-5.0	-10.5	n/m
-3.0	-8.9	n/m
-2.2	-16.0	n/m
-8.8	11.5	249.4
-2.1	-17.6	n/m
3.7	-23.5	40.4
-1.8	-9.4	n/m
5.8	-25.1	60.0
9.1	-23.5	106.1
12.9	-14.2	290.9
0.8	-10.2	21.8
0.0	**-8.1**	**n/m**
1.9	**-10.4**	**53.8**
-0.3	**-16.5**	**n/m**
1.4	**-4.0**	**109.7**
1.5	**-8.3**	**55.4**
4.5	-19.2	65.2
0.7	-19.0	9.9
0.6	2.9	n/m
4.0	-4.4	293.5
1.8	-5.9	94.8
1.3	**-8.0**	**50.8**
-1.2	-11.3	n/m
-6.1	-6.4	n/m
0.1	-16.5	1.7
-5.7	-25.0	n/m
2.8	-8.2	104.8
3.5	8.0	n/m
4.1	-6.5	201.0
-0.8	-16.0	n/m
16.2	10.9	n/m
1.3	**-4.8**	**84.7**
-3.9	-4.2	n/m
1.1	2.0	n/m
1.3	-8.0	50.8
7.1	-10.4	215.9
8.1	-14.2	174.5
2.0	1.0	n/m
1.5	**1.7**	**n/m**
-0.7	3.5	69.6
0.5	0.1	n/m
3.1	4.1	n/m
7.8	-9.6	260.6
-1.5	5.1	95.9
-1.1	-3.9	n/m

Source: ONS

The next step in this analysis involves allocating the 44 sectors of our dataset into four broad categories or baskets (Z, A, B and C). Sectors that are in structural decline, where pre- and post-slump output growth rates are negative, have been placed into basket Z. In aggregate, the sectors in basket Z account for 4.7 per cent of the economy's total output. Our allocation of the 44 sectors into these four baskets is illustrated in more detail in Table 6.

Table 6: Sectors classified according to the strength of their recovery

Weights	Basket Z (4.7%)	Basket A (55.8%)
	The growth rate has remained negative in the post slump period	The post slump growth rate is less than half of the the 2002-2007 growth rate, or the rate from 2002-2007 was +ve and post slump has been -ve
1000		GVA balanced at basic prices
6		Agriculture
24	Mining and quarrying	
19		
3		
9	Manufacture of wood and paper products and printing	
1	Manufacture of coke and refined petroleum product	
10		Manufacture of chemicals and chemical products
10		Manufacture of basic pharmaceutical products & pharmaceutical preparatio
7		Manufacture of rubber plastics prods & other non-metallic mineral produc
13		
7	Manufacturing of computer electronic & optical products	
3		
7		
9		
7		
15		Electricity gas steam and air conditioning supply
12		
68		Construction
18		
41		Wholesale trade except of motor vehicles and motorcycles
52		Retail trade except of motor vehicles and motorcycles
8		
21		
18		Land transport and transport via pipelines
5		Air transport
14		Warehousing and support activities for transportation
7	Postal and courier activities	
16		
18		Telecommunications
22		Computer programming consultancy and related activities
3		Information service activities
4		
73		Financial service activities except insurance and pension funds
71		Real estate activities
54		Legal, accountancy, management, architecture, engineering technology testing a
15		
44		
34		
54		Public administration and defence/ compulsory social security
68		
79		
15		
14		Other service activities
4		Activities of households as employers of domestic personnel
		NB: weights may not a

	Basket B (18.7%)	Basket C (20.8%)
e growth	The post slump growth rate is between half and the full growth rate achieved in 2002-2007	The post slump growth rate is higher than the growth from 2002-2007, or the growth rate from 2002-2007 was -ve and post slump has been +ve
		Manufacture of food products beverages and tobacco
		Manufacture of textiles wearing apparel and leather products
ons		
ts		
		Manufacture of basic metals and metal products
		Manufacture of electrical equipment
		Manufacture of machinery and equipment n.e.c.
		Manufacture of transport equipment
	Other manufacturing and repair	
	Water supply; sewerage waste management & remediation activities	
		Wholesale and retail trade; repair of motor vehicles and motorcycles
		Accommodation
	Food and beverage service activities	
		Publishing audiovisual and broadcasting activities
		Transport and storage, information and communications residual
ctivities		
		Other professional, scientific and technical activities
		Administrative and support service activities
		Business services and finance residual
	Education	
	Human health and social work activities	
		Arts entertainment and recreation

dd up due to rounding

Source: ONS

Our analysis reveals that basket A, which contains 20 sectors and accounts for 55.8 per cent of the UK economy's output, is the largest. This basket contains sectors for which output growth since the trough has been less than half as strong as before the slump, or has turned from positive to negative. Most categories which feature in basket A are services providers, with just three from the manufacturing sector; namely chemicals, pharmaceutical products and the production of rubber, plastics and other non-metallic mineral products.

Business and financial services, legal and accountancy services and real estate activities account for close to 50 per cent of the weight within this basket. Since the UK was particularly exposed to the excesses of the financial sector during the bubble, the subsequent collapse in financial sector turnover (except in the fixed-interest market) has contributed significantly to the large weight of basket A.

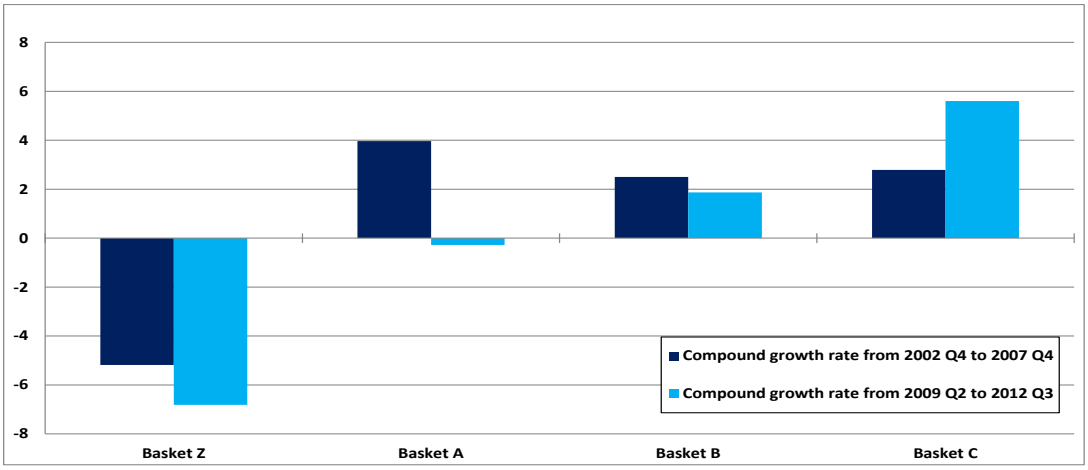
In Basket B we have included sectors for which the post-trough slump growth rate has moderated to no less than half its trend in the 2002-2007 years. Three of the five items in this basket belong to the service sector while water supply and waste management and other manufacturing and repair belong in the industrial sector grouping. Together, these five sectors account for 18.7 per cent of GDP. Basket B contains sectors that are among the most resilient in the economy, suffering only minor output loss during the slump. Some of the larger sectors within this basket, for instance human health and social work activities, which are mostly provided by the government, were largely unaffected by the crisis.

The remaining fourteen sectors were placed in basket C, with a total weighting of 20.8 per cent. This basket contains the sectors which have recorded the most dynamic response since the trough. Many suffered a dramatic output loss during the slump, but have rebounded at a faster pace than their pre-slump trend. This basket also includes sectors for which the compound annual growth rate prior to 2007 was negative but has since turned positive. The fourteen sectors are split almost equally between manufacturing and services.

Figure 16 compares each basket's growth performance between quarter two 2009 and quarter three 2012 versus those experienced

in 2002-2007. Taken as a whole, Basket C's compound annual growth rate since the 2009 trough has been double that of the pre-slump trend (5.6 per cent against 2.8 per cent). Basket B shows a recovery trend that is 75 per cent of its prior growth rate, while basket A has seen a negative compound annual growth rate (-0.3 per cent) since quarter two 2009 compared with a four per cent expansion in the five years before growth peaked. Basket Z highlights the ongoing and deteriorating condition of its constituents.

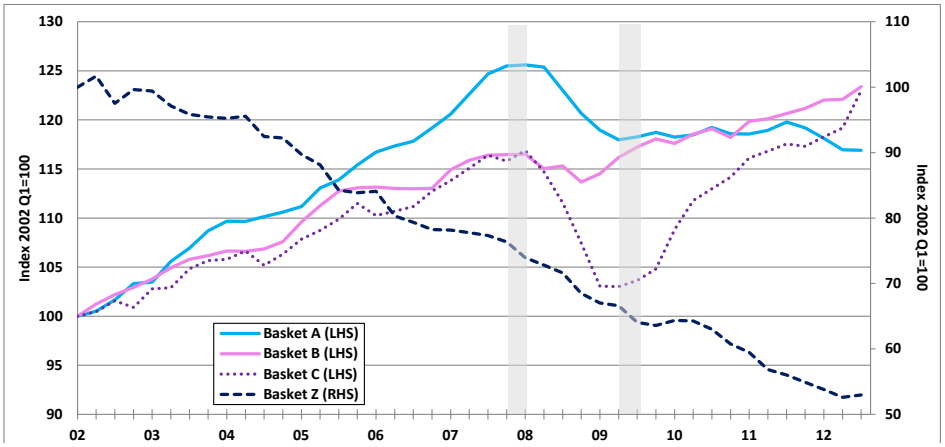
Figure 16: Pre-crisis and post-slump growth rates by basket



Source: ONS

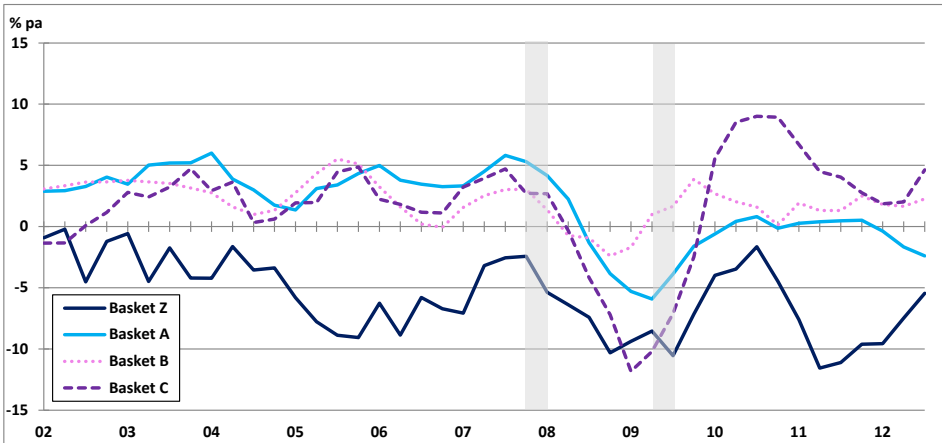
Figure 17 contains the output levels of each basket and Figure 18 displays their respective annual growth rates. Basket A's poor performance principally reflects the travails of financial services and its ancillaries. A tightening in lending in the aftermath of the crisis, as the Bank of England sought to unwind its emergency lending scheme, may be an important factor holding back the recovery of the sectors in this basket. Basket C, on the other hand, displays a more traditional V-shaped recovery while basket Z contains those categories which we highlighted as being in structural decline.

Figure 17: Output by basket (index 2002 Q1=100)



Source: ONS

Figure 18: Growth rate of each basket

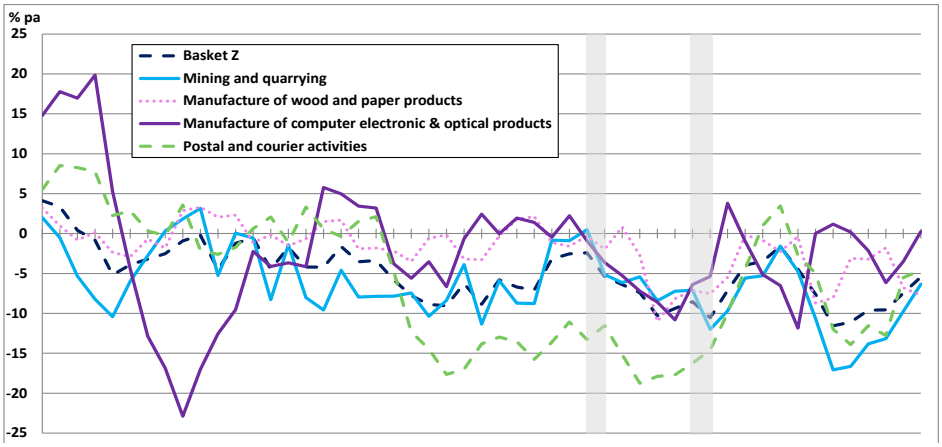


Source: ONS

In order to give a clearer picture of the identities of the four baskets, the growth rates of the main constituents of each are shown in Figures 19 to 22. All components within basket Z (Figure 19) have experienced either negative or low annual growth rates including the manufacture of computer electronic and optical products. While UK firms have carved a niche in higher-value-added activities such as complex, low-volume, high-mix-type printed circuit board assemblies for industrial, broadcast, medical and defence customers, the bulk of the activity in this sector has migrated to Asia.

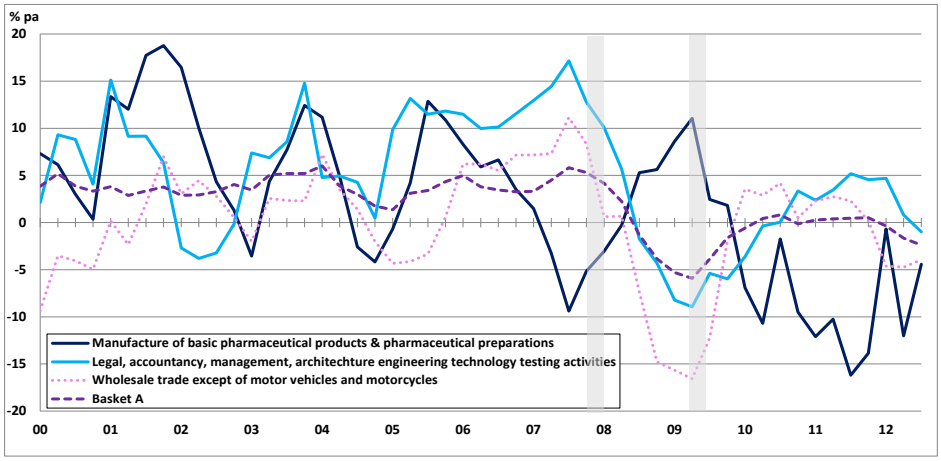
Basket A (Figure 20) has suffered from a negative growth rate for the past three quarters. Financial service activities have been contracting by an average of 4.5 per cent per year since quarter two 2009. Another important component driving down output growth has been wholesale trades (except motor vehicles and motor cycles), declining by 4 per cent per year on average for the past three quarters. The pharmaceutical industry is undergoing a period of intense transformation. Increased scrutiny of operational and research practices together with questions over the safety of marketed drugs has created uncertainty in what has traditionally been considered a highly profitable business. We present equivalent charts for baskets B and C in Figures 21 and 22.

Figure 19: Basket Z and selected subcomponents



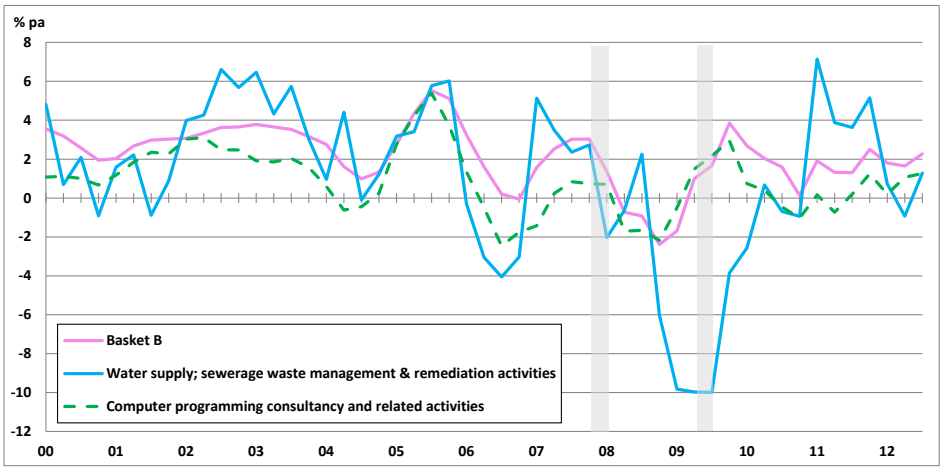
Source: ONS

Figure 20: Basket A and selected subcomponents



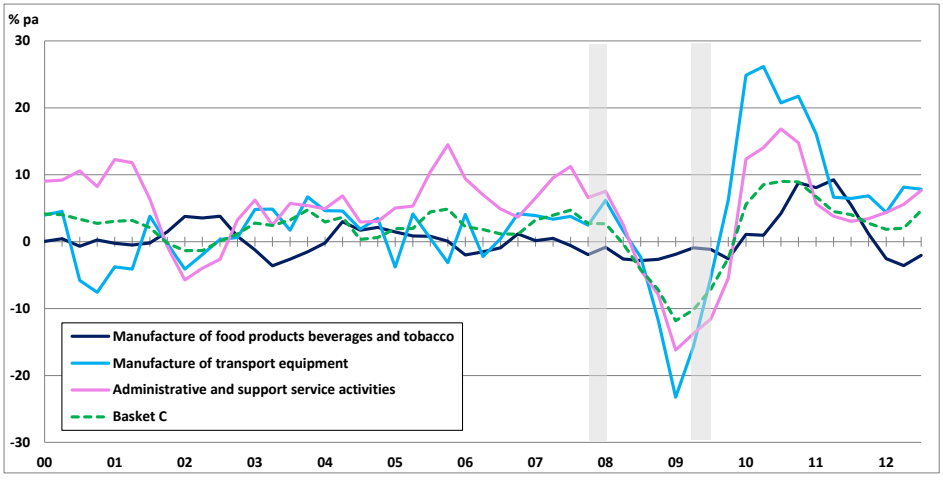
Source: ONS

Figure 21: Basket B and selected subcomponents



Source: ONS

Figure 22: Basket C and selected subcomponents



Source: ONS

Estimating the UK's sustainable rate of growth

The assembled evidence points strongly to the conclusion that the growth rate of many UK service sectors and a few manufacturing sectors was enhanced significantly through the use of increasing economic leverage between 1997 and 2007. Exaggerated credit growth was facilitated by a combination of global credit conditions and UK-specific credit market characteristics. Additionally, in 1997, the UK adopted an experimental policy regime that reallocated responsibilities for financial supervision and regulation and charged an operationally independent Bank of England with a narrow inflation mandate.

It is clear from the disaggregated analysis of UK output that the vast majority of sub-sectors have struggled to restore the level of output that pertained pre-slump. Overall, the compound annual growth of the economy since quarter two 2009 remains well below the rate of growth from 2002-07. The stagnation of many sectors, allocated to basket A, is indicative of their ongoing dependence on affordable and available external finance. Despite the initially rapid rebound for the constituents of Basket C, 6 out of the 14 industries included have yet to restore their pre-crisis peaks.

As we have argued above, for some industries the attainment of 2007 output peaks may prove impossible, with the crisis having severely impaired the economic viability of the activity. The greatest hindrance is likely to stem from more restrictive access to and more keenly priced bank credit, curtailing the supply of credit to producers and to individuals. For this reason, the long term sustainable rate of economic growth is expected to remain well below its presumed trend for the indefinite future. Consequently, neither the simple extrapolation of pre-crisis output trends nor the growth arithmetic approach is likely to yield a realistic assessment of the economy's potential growth rate. Indeed, any approach that rests on an assumed rate of productivity growth but takes no account of the enabling, or disabling, role of credit will flatter to deceive.

Our credit-driven economy has ground to a halt in the face of an over-bearing regulatory framework, a central bank that has sought to retract financial support prematurely and, latterly, the additional headwinds from the European financial crisis. If the UK is to regain

even a 1.5 per cent to 2 per cent annual economic growth trajectory, credit constraints on unencumbered businesses and consumers must be eased as an urgent priority.

On the basis of prevailing credit conditions and associated output performance, our mean forecast of sustainable output growth is approximately 0.8 per cent per annum (more than 2 percentage points below its pre-slump trend). Since direct observation of an economy's supply capacity is not possible, we have observed the post-crisis activity of all 44 output sectors, alongside public sector policy adjustments, in order to determine the likely momentum of the economy moving forwards. Obviously this is subject to a significant degree of uncertainty, and as such we have made range forecasts, as opposed to point estimates in Table 7.

Table 7: Economic Perspectives' UK sustainable growth rate projections

	Basket Z	Basket A	Basket B	Basket C	Aggregate
	This consists of subcomponents whose growth rate has become more negative than in 2002-2007	This consists of subcomponents whose growth rate is less than half of that achieved in 2002-2007	This consists of subcomponents whose growth rate is between half and the full rate of that achieved in 2002-2007	This consists of subcomponents whose growth rate is higher than that achieved in 2002-2007	GVA estimated arithmetically
Basket weight	*4.7*	*55.8*	*18.7*	*20.8*	*100.0*
Highest expected per annum growth rate	**-5**	**1.5**	**3**	**5**	**2.2**
Average expected per annum growth rate	**-7.5**	**0.5**	**2**	**2.5**	**0.8**
Lowest expected per annum growth rate	**-10**	**-0.5**	**1**	**0**	**-0.6**
NB: weights may not add up due to rounding.					

Source: EP estimates

Conclusion

The growth arithmetic used by the OBR, inherited from the Gordon Brown era, suggests that the UK economy will naturally gravitate to an annual GDP growth rate of around 2.3 per cent per annum. This approach rests on an assumed rate of productivity growth that takes no account of the enabling, or disabling, role of credit. If the abuse and misuse of credit was responsible for an exaggeration of economic growth during that ‘golden decade’, it is entirely plausible that a flawed reaction to these excesses is holding back our recovery. In the absence of supply-side reforms and the retraction of public sector economic influence, the sustainable UK economic growth rate may be in the region of 1 per cent per annum.

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The UK economic experience of the last five years – stagnation[22]

by Trevor Williams

Not surprisingly, questions about the growth rate of the economy have featured heavily in economic analysis over the last few years. Gross domestic product (GDP), defined as the volume of all goods and services produced in the economy, dropped 6.3 per cent from the peak level reached in 2008 and is still some 3 per cent lower than its peak five years later. That is unprecedented in 170 years of shocks that have hit the UK economy since it industrialised. We should bear in mind, though, that the fall in UK economic growth in 2009 followed 16 years of uninterrupted growth, so any shock had the potential to be a major one. If we simply extended the 10-year average rate of growth of GDP per annum (2.7 per cent) prior to 2008 to where we are today, it implies that the economy is roughly 14 per cent smaller than it could have been.

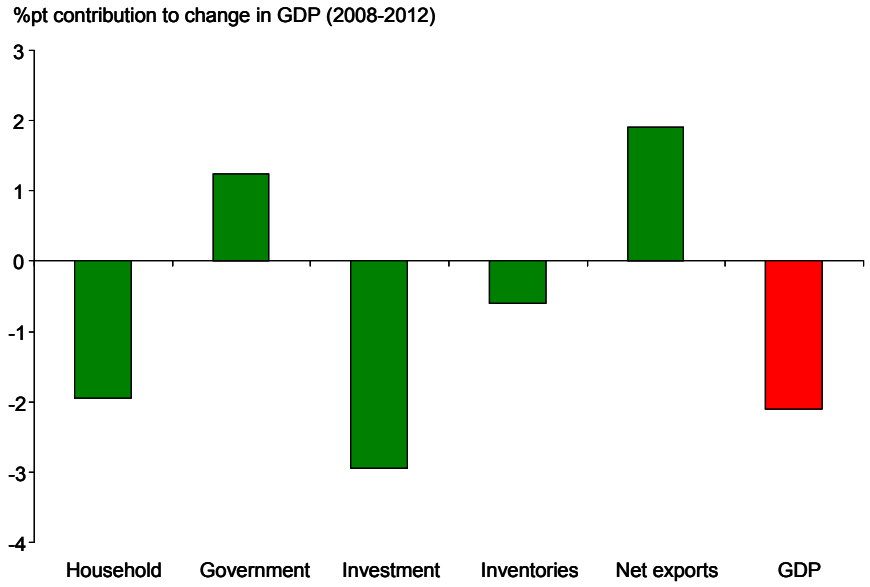
What is going on? Why has the UK economy stagnated for the last five years? Why does it show few signs of a robust recovery? At one level, this seems a naïve question, as the explanation appears to be simple.

22 The author would like to thank Jonathan Thomas for his invaluable help in producing the charts used in this publication.

Looking at the various components of he expenditure measure of GDP, the reasons for the UK's poor economic performance would appear to be that investment and consumer spending are sharply lower than they were prior to the onset of recession. Hence, they are mainly responsible for dragging the economy lower. Investment spending is 21 per cent lower than its pre-crisis peak. Consumer spending is 'just' 5 per cent lower. Of course, since consumer spending accounts for 60 per cent of GDP and investment 15 per cent, the former is almost as important as the latter in terms of its percentage contribution to the lack of recovery in GDP (see Figure 23). However, the scale of the reduction in the level of investment clearly marks it out as the key driver of the downturn.

What about the other components of GDP? In terms of contribution to the change in GDP growth, government consumption is positive, net trade (exports minus imports) is positive and stocks are mildly negative.

Figure 23: Percentage contributions to change in GDP since the 2008 peak



On the surface, this explanation seems sufficient but it is superficial as it does not explain *why* the economy remains stagnant; why

it still remains below its 2008 peak today; and what the future growth rate is likely to be. These questions are tackled in the rest of this analysis.

Why potential output matters

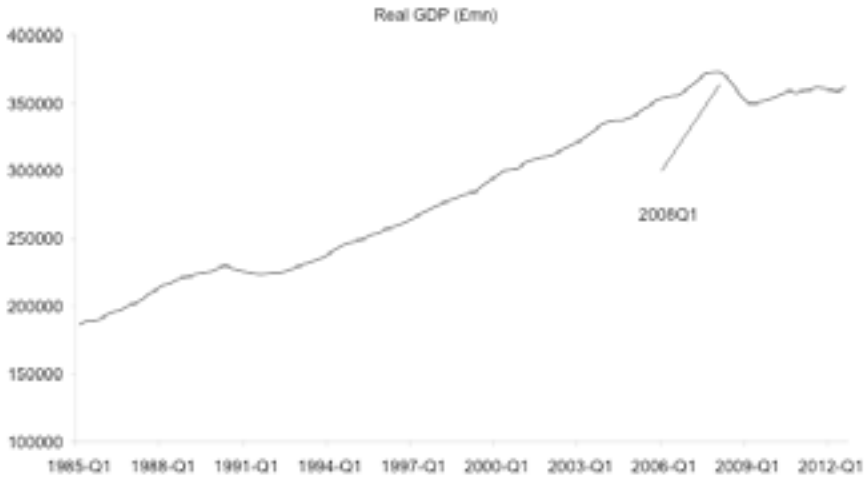
To take the analysis further, we need estimates of potential output growth. This cannot be directly observed, but there are a number of different ways that it can be calculated. Firstly, we can use aggregate top-down approaches, in some cases based on financial market variables such as bond yields (Martin and Sawicki, 2003). Secondly, we can use dynamic stochastic general equilibrium models (DSGE) which are mainly business cycle derived estimates of activity that are based on the output an economy can achieve in the absence of wage and price rigidities (Bean, 2005). Thirdly, there are growth accounting or production function methods, which focus on the underlying primary factors that determine economic growth – namely labour supply, capital, productivity and technical change.

Each approach has its advantages and disadvantages (Mishkin, 2007). However, we will focus on the production function approach as it best captures structural changes, which, in our view, is key to understanding the effects of the financial crisis and the recession on investment spending, changes in productivity and technical change. If the economy has indeed undergone some substantive permanent change, it would be discernible in one of the factors of production (Benito et al., 2010). Thus this approach will help facilitate a better understanding of the underlying changes that have caused GDP to remain stagnant for so long, and to estimate what this means for future output growth. It will allow us to look at developments in labour and capital and in their productivity and also look at technical change in order to answer the questions posed above.

Has there been a permanent loss of supply capacity?

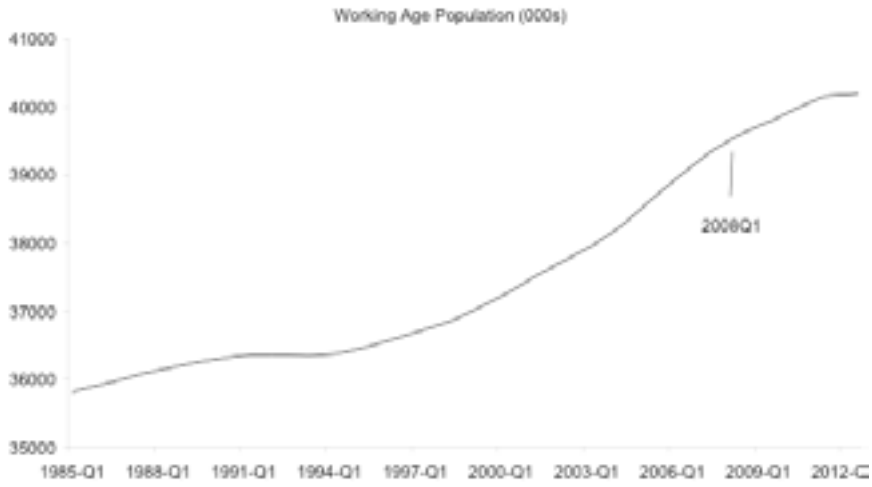
It is clear that something has changed in the last few years (Balakrishnan et al., 2009). As has been noted, real GDP is still well below its 2008 peak, as shown in Figure 24.

Figure 24: Real GDP (£m)



If we look at the components of supply since the peak of GDP in 2008 quarter one, the evidence mostly points to a decline in potential output since 2008. We make the usual assumptions about output being dependent upon labour and capital productivity, the supply of labour, supply of capital, and so on. Firstly, let us look at the trend of the historical data from above without any 'equilibrium' levels being calculated. In other words, do the channels for 'permanent' supply losses indicate that damage has occurred?

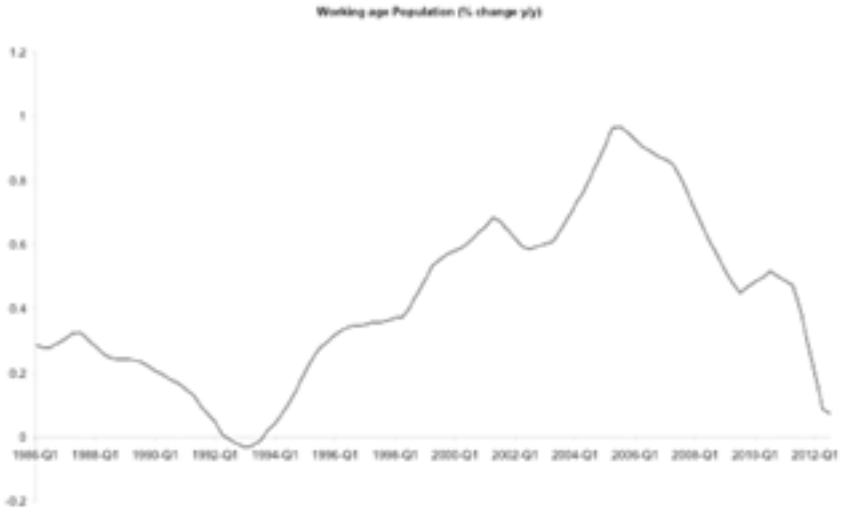
Figure 25: Working age population



The increase in the working age population has slowed, and has roughly levelled off since the start of the financial crisis (see Figure 25). This largely reflects lower net migration, which is harmful for potential output growth. If we take account of the recession, and the subsequent rise in unemployment, and look back to the experience of the early 1990s, the surprise is possibly that the working age population has not fallen in absolute terms.

Of course, it is different this time with the opening of borders in the European Union but there is no doubt that the growth rate of the working age population has lost momentum (Figure 26). Indeed, it is possible that, should the downturn persist, growth of the working population could even turn negative for the first time since 1993/94. In the last few quarters, the slowdown seems to have accelerated.

Figure 26: Growth slowing rapidly in working age population



The increase in the participation rate (Figure 27) within the labour force seems to have levelled off after rising strongly since the end of the recession in 2009. This increase reflects the resilience of the labour market, though in a recent report the Bank of England suggests that less generous retirement packages, as well as declines in equity prices and financial wealth might also have played a role (Benito et al., 2010). On balance, this factor seems neutral for potential output, at least for now.

Figure 27: UK labour participation rate

Unemployment peaked at a lower rate than in previous recessions (Figure 28) but stabilised at a higher level for longer. This creates scope for skills mismatch and skill degradation that could lead to hysteresis (Blanchard and Summers, 1986). This, in turn, could increase equilibrium unemployment weighing heavily on potential output. The longer it takes for unemployment to drop to its natural rate, the harder it is to get back to an earlier, lower level of unemployment in the future. In any event, it could be argued that the increase in long-term unemployment could have been higher. But continued growth in employment, and the recent pick up in the pace, suggests that any hysteresis effects may not be as significant as in the past.

Figure 28: UK unemployment rate

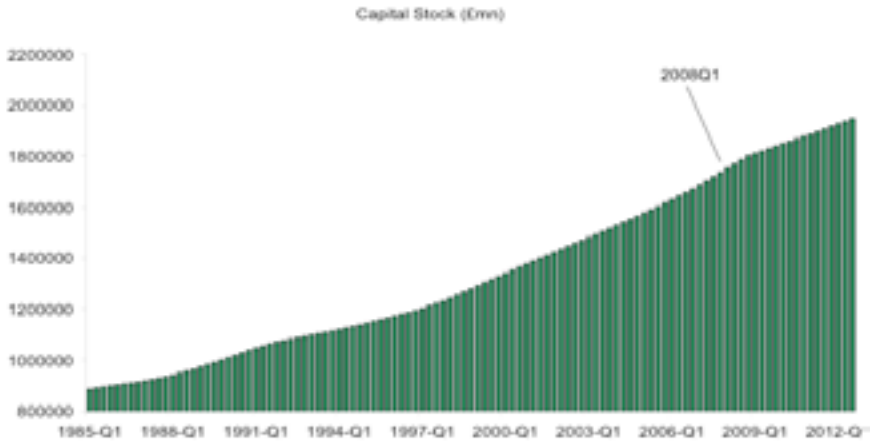
However, Figure 29 shows that the share of long-term unemployed in the total is rising quite sharply, after falling in 2010. This suggests there could be more accumulating mismatch frictions occurring, which would be negative for potential output growth.

Figure 29: long-term unemployment is rising again

Average hours worked is down in the UK from the 2008 level, though it has risen more recently. This suggests only a slight effect, if any, on potential output from this source,

Turning from labour supply to capital, Figure 30 shows that the stock of capital has increased since 2008 but the rate of increase has slowed. As we have noted, investment spending fell sharply, marking it as one of the main reasons why growth has stagnated. In particular, investment spending on machinery and equipment is around one-quarter lower than in 2008. Looking at estimates of the capital stock from Oxford Economic Forecasting (the ONS suspended publication of the data due to concerns over data quality) shows that the growth of capital stock is down very sharply. Indeed, it appears to be down to 1992 levels, having fallen as sharply now as it did then. The difference between the current situation and 1992 appears to be that capital spending is still expanding weakly, and has not recovered much since the slump. It is this that makes the factor negative for potential output, though it is still growing. It should be noted that an increase in capital stock related to the boom could lift potential growth so that after a recession it will drag potential growth lower. Our analysis suggests little evidence of this in the UK, however. Below we show that the capital stock is contributing little to the weakness of growth or the lack of recovery.

Figure 30: UK capital stock growth has slowed

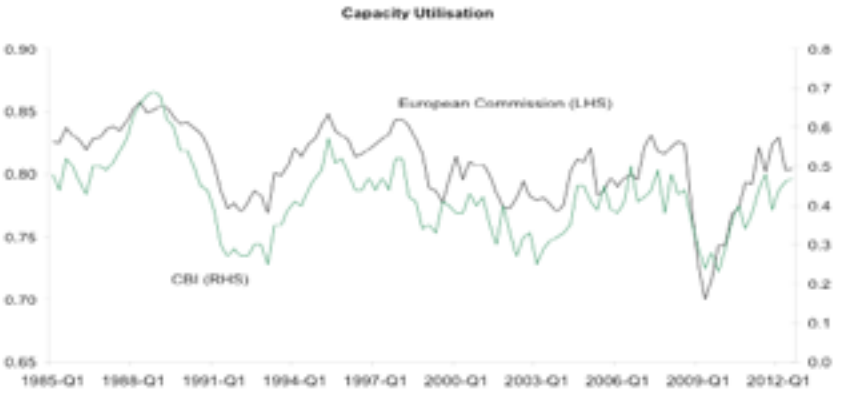


As has been noted above, the slower rate of capital accumulation does seem to correlate with the fall in business investment since 2008, the trend of which is shown in Figure 31. Although the level is below the peak in 2008, there has been some growth from the low point reached in 2009.

Figure 31: UK business investment remains low

What about capacity utilisation as a guide to capital trends. There are two key measures of UK capacity utilisation and both do seem to have recovered, after having fallen close to the 1992 lows first. Figure 32 shows both the European Commission and CBI's measures of capacity utilisation.

Figure 32: UK capital utilisation trending back to the average



If we use these figures to calculate total factor productivity (TFP) then, under both the CBI and European Commission measures, we can see both show the same declining profile (Figure 33), although there has been a sharper fall in the calculation using the CBI version of capacity utilisation than in the EU commission measure. The fall in TFP since 2008 quarter one, possibly reflects lower new business formation; 'intangibles' (such as business training); the hollowing out of more productive sectors (largely financial intermediation); and financial constraints. Clearly, these are negative for potential output. But this analysis suggest that overall, there has been no permanent loss in output capacity.

Figure 33: Total factor productivity has fallen in the UK

Total factor productivity and future growth

An analysis of TFP by the OBR (2012) has identified it as a key potential source of any permanent loss of output in the recent recession. In terms of why output has stagnated so far, taking all the above together in the production format, we can see the following (illustrated in Figure 34):

- It is clear that TFP has driven both legs of the double dip recession
- Moreover, in the five quarters to 2012 quarter three, it is TFP that is responsible for the weakness of the UK economic recovery
- Capital stock, or changes in it, plays very little direct part in the recession, most of the variation in output is driven either by labour or total factor productivity.

Figure 34: Factor contributions to UK growth rate of output

Using estimates from our calculations, based on implied equilibrium levels for the growth rates of factors of production (labour growth of 0.3 per cent, capital stock growth of around 1 per cent and TFP growth of 0.7 per cent) gives an estimate of the long-run potential growth rate of around 2 per cent. Our analysis therefore shows that cyclical factors do not account for the flat pace of potential output growth. Assuming a return to equilibrium levels for factor productivity and the factors of production, UK GDP growth can settle at a significantly faster pace than currently seen. Growth is not destined to stay flat. The current profile for potential output growth can be reversed but we cannot get back the lost output either. It may be stating the obvious, but the UK could experience a lost decade if productivity does not recover soon. So something has to be done to help spark recovery in total factor productivity.

Figure 35: UK potential output growth is currently flat

What can to be done to boost potential growth?

Fortunately, there are a number of ways growth can be boosted, but some of them do imply policy changes and official intervention at a national level. In a recent study by the LSE, *Growth Commission, Investing in Prosperity*, proposals covering investments in skills, infrastructure and innovation were suggested. These include in each category:

- Skills - improving teacher quality through expanding the intake of teachers and engaging in more rigorous selection
- Creating a 'flexible ecology' of schools, with more autonomous primary and secondary schools, greater parental choice and easier growth for successful schools and their sponsors.
- Linking targets, inspections and rewards more effectively to hold schools to account for the outcomes of disadvantaged pupils.

To that list, I would add, more apprenticeships, on-the-job training and the return of dedicated technical colleges that taught skills such as bricklaying, carpentry and plumbing.

With regard to infrastructure they propose: ‘developing a new institutional architecture to address the poor quality of our national infrastructure’. Specifically, they suggest:

- An Infrastructure Strategy Board to provide independent expert advice to parliament to guide strategic priorities.
- An Infrastructure Planning Commission to support the implementation of those priorities with more powers to share the gains from infrastructure investment by more generously compensating those who stand to lose from new developments.
- An Infrastructure Bank to facilitate the provision of finance, to bring in expertise and to work with the private sector to share, reduce and manage risk.
- Encouraging a long-term investment perspective through regulatory changes (for example, over equity voting rights) and tax reforms (for example, reducing the bias against equity finance).

These are just some of the proposals in the report but they give a sense of the range of suggestions that are out there. Of course, none of these would be easy to implement but then no one said change was easy. To restore growth, the focus must be on factor productivity and not on ‘demand management’.

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