CENTRE *for* ECONOMIC PERFORMANCE

UK Economic Performance Since 1997: Growth, Productivity and Jobs

Special Paper No. 24

Dan Corry, Anna Valero and John Van Reenen

December 2011

Centre for Economic Performance Special Paper

Dan Corry is a Visiting Fellow at Southampton University and Chief Executive of New Philanthropy Capital. Anna Valero is an Occasional Research Assistant with the Centre for Economic Performance, London School of Economics. John Van Reenen is Director of the Centre for Economic Performance and Professor of Economics, London School of Economics.

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

LSE THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

CENTRE *for* ECONOMIC PERFORMANCE

CEP Special Paper No.24

UK Economic Performance Since 1997: Growth, Productivity and Jobs

Dan Corry
Anna Valero
John Van Reenen

Acknowledgements
We would like to thank the Economic and Social Research Council for financial support through the Centre for Economic Performance. Many people have kindly given us data and comments including Ray Barrell, Chris Giles, Jonathan Haskel, Bill Martin, Nick Oulton, Jonathon Portes, and Ana Rincon-Aznar. The CEP and ESRC have no political affiliation or institutional view and all co-authors write in a personal capacity.

Executive Summary

A common view is that the performance of the UK economy between 1997 and 2010 under Labour was very weak and that the current economic problems are a consequence of poor policies in this period. In this report, we analyse the historical performance of the UK economy since 1997 compared with other major advanced economies and with performance prior to 1997, notably the years of Conservative government, 1979-97.

We focus on measures of business performance, especially productivity growth. This is a key economic indicator as in the long run, productivity determines material wellbeing – wages and consumption. Productivity determines the size of the "economic pie" available to the citizens of a country.

The big picture

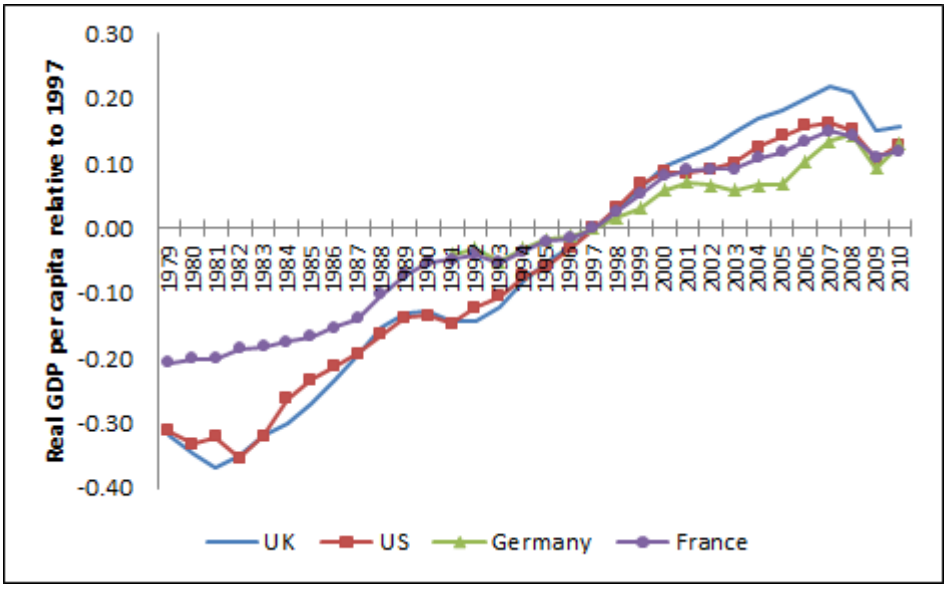
We conclude that relative to other major industrialised countries, the UK's performance was good after 1997. The growth of GDP per capita – 1.42% a year between 1997 and 2010 – was better than in any of other "G6" countries: Germany (1.26%), the US (1.22%), France (1.04%), Japan (0.52%) and Italy (0.22%). Figure 1 shows GDP per capita levels in four countries relative to 1997. The height of the line indicates the cumulative growth: in 2010, the UK had a level of GDP per capita 17% higher than in 1997; over the same period US GDP per capita had grown by 14%.

The UK's high GDP per capita growth was driven by strong growth in productivity (GDP per hour), which was second only to the US, and good performance in the jobs market (which was better than in the US). The UK's relative economic performance appears even stronger in the years prior to 2008 before the Great Recession engulfed the developed world.

But wasn't it all a bubble?

The UK's strong productivity performance relative to other countries was a continuation of the trends during the period of Conservative government from 1979. This broke a pattern of relative economic decline stretching back a century or more. UK GDP per person fell relative to the US, Germany and France from 1870 to 1979, but over the next three decades this trend reversed. UK GDP per capita was about 23% above the US in 1870 whereas the US was 43% ahead of the UK in 1979. By 2007, the UK still lagged behind the US, but the gap had closed to 33%. During the past 30 years, the UK has had a faster catch-up of GDP per capita with the US under Labour than under the Conservatives, although there was a slower rate of relative improvement over France.

Trends in GDP per capita (adult) 1979-2010 (relative to 1997)



Notes: Analysis based on OECD data. GDP is US$, constant prices, constant PPPs, OECD base year (2005). Adults refer to the population over 16, for which data is sourced from US Bureau of Labour Force Statistics ("working age adults" series). Data for Unified Germany from 1991. For each country the logged series is set to zero in 1997, so the level of the line in any year indicates the cumulative growth rate (e.g. a value of 0.1 in 2001 indicates that the series has grown by exp(0.1)-1=11% between 1997 and 2001). The steeper the slope of the line, the faster growth has been over that period.

But was the growth in productivity due to "unsustainable bubbles" in sectors such as finance, property, oil and the public sector? The answer is "no". The expansion of property and the public sector both actually held back measured aggregate productivity. The financial sector contributed only about 0.4% of the 2.8% annual growth in the UK market economy between 1997 and 2007. Our analysis shows that the biggest contributors to productivity increases were the business services and distribution sectors, and they were generated through the increased importance of skills and new technologies. It is difficult to see why all such activities could be generated by an artificial financial or property bubble.

Analysis of other indicators of business performance, such as foreign direct investment, innovation, entrepreneurship and skills, supports our view that the gains in productivity were largely real rather than a statistical artefact. This evidence points to a more positive reading of the supply side of the economy than the current consensus. Although the UK still has some long-standing issues in terms of lower investment relative to other G6 economies (especially in R&D and vocational skills), things have improved.

Did Labour's policies have any positive influence?

Some have argued that Labour simply enjoyed a "free ride" on the radicalism of Mrs Thatcher. Most analysis suggests that freeing up the labour market through breaking union militancy, removing subsidies for "lame ducks" and implementing privatisation, lower marginal tax rates and cuts in benefits all boosted productivity performance after 1979. On this line of argument the best that could be said is that at least Labour did not return to the failed pro-union, anti-competitive policies of the 1970s.

The "at least Labour didn't mess it up" argument is not at all compelling. It is hard to believe that the reforms in the conservative years permanently kept productivity growth higher for the next 15 years. The anti-union policies may have raised output, for example, but it

stretches credulity to think they kept the UK on a permanently better productivity growth path.

We argue that it is more likely that some policies of the Labour government drove some of the productivity improvement. In particular, the strengthening of competition policy, the support for innovation, the expansion of university education and better regulation in telecoms and elsewhere played a positive role. It is possible that immigration may have also played a positive role. But establishing the magnitude of the causal impact of these policies is extremely difficult, and the need for proper quantitative policy evaluation remains as strong as ever.

The policy area where Labour cleared failed was in financial regulation. In addition, and more clearly with hindsight, public debt was allowed to rise higher than it should have. Although these factors did not drive the boom and did not cause the global recession by themselves, the UK economy was more vulnerable to the recession than it should have been.

Does the Great Recession change everything?

Does the experience of the recession since 2008 show that the productivity improvements to the supply side since 1997 were illusory? We have argued "no" as the 1997-2010 improvements were real and not due to the bubble sectors of finance, property and oil.

But how much did the financial crisis permanently reduce the rate and level of productivity growth? The extreme version of the "supply-side pessimism" argument is that because the recession was caused by a banking crisis, the fall in potential output has been severe, the UK's output gap (the difference between actual and potential GDP) is now close to zero with productivity growth permanently lower for the foreseeable future. Pessimists point to the 7% fall in GDP and slower growth from the trough of the 2009 recession.

It is likely that the recession has caused some permanent fall in output compared with what it would have been without such a deep downturn. But we think there is huge uncertainty over the size of the output gap. An alternative explanation to a supply shock that had permanently reduced the level and growth rate of potential output is that global demand is muted. Several elements point in this more optimistic direction. First, the pre-2008 productivity growth rate suggests that the supply side made real improvements before the crisis. Second, the fall in productivity 2008-11 is broad based and not all due to specific sectors such as finance and oil (just as the 1997-2008 productivity growth rates were not dominated by these sectors). Third, we look at the evidence put forward by the pessimists on inflation, jobs, capacity utilisation surveys and trade performance, and argue that none of these make a compelling case that the output gap is tiny.

We worry that policies based on an excessively pessimistic view of potential output can lead to needlessly slow economic growth. Indeed, the pessimism over the state of the supply side can become self-fulfilling as ever-larger austerity programmes cause excess scrapping of human and physical capital.

Policies in the short to medium run: to Plan B or not to Plan B?

The current "Plan A" for the UK economy is a period of very strong fiscal consolidation – spending cuts and tax rises to eliminate the structural public sector deficit in the life of this Parliament. An alternative Plan B would be to slow down the pace of the fiscal consolidation. If the output gap was near zero, then a Plan B would simply increase inflation, so the fact that we think there is a good chance of a substantial output gap implies the possibility of a Plan B.

The desirability of a Plan B would be muted if monetary policy was sufficient, if fiscal policy was ineffective in an open economy like the UK, if any increase in public spending or tax cuts was irreversible or if markets would panic at any retreat from Plan A.

We consider these problems, but do not find them overwhelming objections. We argue that we do indeed need a medium-term plan for debt reduction but this does not have to be done at the current speed when the world economy is so fragile. This is also true for Northern Eurozone countries and the US. Thus we need a short-term stimulus ("Plan B") and a long-term growth strategy ("Plan V").

A strategy for long-run growth

Whatever view is taken on shorter-term policies, all sides agree on the need to focus on longer-term growth. We draw out some of the lessons from our analysis for how to restore longer-term growth.

The structural improvement in the UK's relative performance since 1979 contained the lesson that getting the market environment right is key: strong product market competition, openness to foreign investment, flexible labour markets, a robust welfare to work system and smart regulation are major factors in promoting growth. Government has a role in all of this, setting the rules, and it also needs to be pro-active in building human capital and infrastructure and supporting innovation.

We argue that a growth strategy must go beyond the "laundry list" approach (even if such a list is useful) as policies interact with each other and policy efforts must be tightly focused. We sketch a plan for a "V-shaped" recovery that requires the state and civil society to scan the global economy for potential growth in demand, and then hone in on areas where the UK has actual or latent comparative advantage. Within this space there has to be relentless scrutiny of where the state is hindering and where it could help. A specific example is higher education where foreign students are an export industry of global growth and where the UK has very successful elite science. Restricting high skilled immigration is hugely damaging to this sector. More generally, growth policies could include supporting sector-specific skills, access to credit for small enterprises and subsidising innovation in key industries like green technologies, software and healthcare. We offer less of a blueprint for growth than a way of thinking about growth that could form the basis for economic revival.

Some caveats

This is a data-driven report and data change by the day. Our conclusions may change as we get more information, and this is especially true of the period since 2008. This report focuses on business performance, above all productivity as this is a key economic measure of welfare. This is not because we think other dimensions of the economy are unimportant, but rather because we have limited space.

We discuss labour markets to some degree, especially with regard to how job performance affects overall GDP per capita growth and the issue of long-term unemployment, but it is less of a focus than business performance. We discuss inequality only in regard to regional variations as some have argued that these spatial differences have a causal effect on overall growth.

Finally, we are well aware that measured national output does not reflect all aspects of the human condition, such as happiness, health and the environment. But we remain strongly of the view that the growth of national output per person is all else equal, a desirable thing.

A roadmap to the report

We present the "big picture" in Section 1 on macro trends on GDP and productivity and then decompose where this growth is coming from – which industries and which factors. Section 2 then looks at a host of other indicators of business performance, such as investment, innovation and entrepreneurship. We show improvements since 1997 and ask in Section 3 whether any of these were caused by Labour's policies. Section 4 examines the Great Recession after 2008 focusing on the UK as detailed comparative data are not available for all countries yet. Section 5 turns to policies: we look first at the short and medium run, focusing on austerity, and then on long-run growth strategies.

1. UK Relative Economic Performance Since 1997: Growth, Productivity and Jobs

1.1 Introduction

We begin by laying out some of the facts of economic performance since 1997, but put this in an international and historical context. First we look at the aggregate trends in GDP, productivity and jobs (sub-section 1.2). After showing the surprisingly strong UK performance we look in more detail at where productivity has come from in terms of the contribution of different sectors, such as finance, and different factor inputs such as capital and skills (sub-section 1.3).

Overall, we find that British performance was impressive between 1997-2010 compared to other major countries both in terms of productivity and the labour market. The productivity performance was not primarily driven by the "bubble" sectors of finance, property or government services. Rather, human capital, ICT and efficiency improvements were the dominant forces especially in the business services and distribution sectors.

1.2 Analysis of Aggregate Trends in National Income and Productivity

We begin by comparing the macro-level economic performance of the UK with its major peers. There is an argument for focusing our analysis of the Labour period up to 2008 – i.e. before the Great Recession which was essentially a global shock. However a tougher test is to look across the whole period in which Labour was in government through 2010. Since we know that the UK was hit harder than most other nations by the Great Recession we would expect the record to be poorer when including the later years. In Table 1 the first three columns examine the 1997-2010 period and the last three columns the 1997-2007 period.

We use data from the OECD, which contains internationally comparable data on output, employment, hours and the other elements to estimate economic performance. Table 1 shows that during the 1997-2010 period UK GDP growth was second only to the US (1.93% p.a. vs. 2.22% p.a). Of course, absolute economic growth is not as important for welfare as national income per person as this will ultimately determine wages and consumption. In terms of GDP per capita (in terms of total population), a key measure of economic welfare, the UK outperformed every other country in Table 1 (1.42% a year compared to 1.22% in the US and as low as 0.22% in Italy).

Could some of these patterns be driven simply by worse demographic trends? To partially control for this, the third column of Table 1 presents GDP per adult, (and this is the main measure of overall economic performance that we use in this paper). Here again, the UK outperformed all the other advanced nations including the US and Germany. Although data from the most recent years is likely to be revised, even if the UK's 2008-2010 growth was

much worse than recorded, it's relative position over the entire post 1997 period is unlikely to dramatically change (other countries will also have their data revised).

Table 1: Growth of GDP, GDP per person and GDP per adult, 1997-2010

	1997-2010 (whole period of Labour)			1997-2007 (up until the Great Recession)		
	GDP	GDP per capita (person)	GDP per capita (adult)	GDP	GDP per capita (person)	GDP per capita (adult)
UK	1.93	1.42	1.22	2.89	2.43	2.20
US	2.22	1.22	0.99	3.00	1.96	1.64
Germany	1.24	1.26	1.01	1.67	1.64	1.35
France	1.66	1.04	0.92	2.31	1.66	1.51
Japan	0.59	0.52	0.31	1.15	1.02	0.79
Italy	0.69	0.22	0.19	1.45	1.01	0.99

Notes: Cumulative annual growth rates (in %). Analysis based on OECD data (extracted on 28 Oct 2011 from OECD.Stat). GDP is US$, constant prices, constant PPPs, OECD base year (2005) from GDP database. Adults refer to "working age adults", obtained from US Bureau of Labour Force Statistics, and includes the civilian non-institutional population aged over 16. Data for Unified Germany from 1991.

Following the approach of Card and Freeman (2004) we focus on GDP per adult as our preferred measure of GDP per capita (in columns (3) and (6) of Table 1) for further analysis. The denominator is defined as adults in the civilian, non-institutional population over the age of 16 (for most countries)[1]. Output per capita can be decomposed into its constituent elements: output per labour input (or "productivity") and labour input per capita (a measure of labour market performance). Two alternative measures of labour input are considered: number of workers and total hours worked[2]. This type of decomposition allows us to determine how much of a country's growth performance is due to working "smarter" (i.e. productivity gains) versus working "harder" (higher employment rates or hours per average adult).

In order to try to appraise Labour's impact on the economy, we also compare the UK's performance over 1997-2010 not only to its most relevant peers, but also its performance over the preceding years. For this purpose, it makes most sense to consider the period 1979-1997 which corresponds to the Thatcher-Major led Conservative governments.

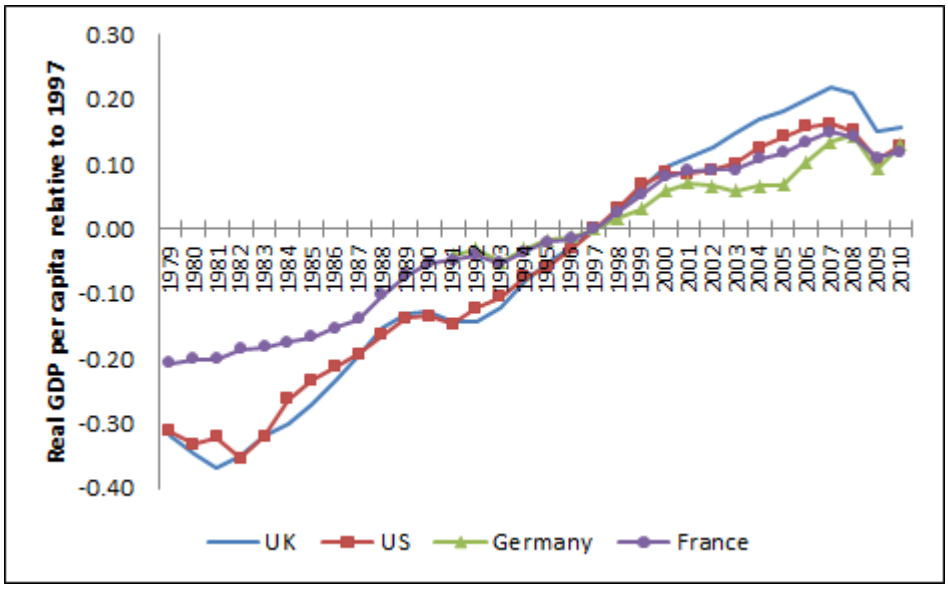
The results are contained in Figure 1 (GDP per capita), Figure 2 (GDP per worker) and Figure 3 (GDP per hour). We base each series in 1997 to show the cumulative performance of the UK and other countries before and after the 1997 election, so the slope of the line can be interpreted as growth rates. We plot GDP per capita in Figure 1. The fact that the UK line

[1] Data on "working age adults" is obtained from USBLS http://www.bls.gov/fls/flscomparelf/population.htm. Card and Freeman (2004) used USBLS for civilian, non-institutional working age adults for 15-64 year olds, but the current USBLS data that we use is defined as the civilian non-institutional population over the age at which compulsory schooling ends (16 for most countries), and has no upper limit. It is noted that the German data includes the institutional population. OECD data on 15-64 year olds is currently unavailable for 2010 for all four countries considered here, but we obtain qualitatively similar results to those reported here when using this data over the shorter time period.

[2] As defined at http://www.oecd.org/document/29/0,3746,en_2649_29964795_48571357_1_1_1_1,00.html, labour input is defined as total hours worked by all persons engaged. The data are derived as average hours worked (from the OECD Employment Outlook, OECD Annual National Accounts, OECD Labour Force Statistics and national sources) multiplied by the corresponding and consistent measure of employment for each particular country.

ends up above all other countries shows in graphical form what was already revealed in the numbers in Table 1. The fall in GDP per capita in the Great Recession is evident in all countries, but appears particularly large in the UK. Figure 1 also shows that the UK grew faster than its peers in the 1979-1997 period. Under the Conservative period UK per capita GDP growth was similar to the US and significantly stronger than French growth (we do not have a consistent series for Germany because of re-unification after 1989).

Figure 1: Trends in real GDP per capita (adult) relative to 1997



Notes: Analysis based on OECD data (extracted on 28 Oct 2011 from OECD.Stat). GDP is US$, constant prices, constant PPPs, OECD base year (2005) from GDP database. Adult refers to "working age adults", obtained from US Bureau of Labour Force Statistics, and includes the civilian non-institutional population aged over 16. Data for Unified Germany from 1991. For each country the logged series is set to zero in 1997, so the level of the line in any year indicates the cumulative growth rate (e.g. a value of 0.1 in 2001 indicates that the series has grown by exp(0.1)-1=10% between 1997 and 2001). The steeper the slope of the line, the faster growth has been over that period.

As discussed earlier, GDP per capita can be decomposed into productivity growth and labour market performance. As an accounting identity, GDP per capita = GDP per employee (productivity) x employees per capita (the employment rate). An alternative decomposition is GDP per capita = GDP per hour x hours per capita. GDP per hour is a better measure of productivity than per worker because it accounts for part-time work, the fact that some workers may hold multiple jobs and differences in hours worked due to holidays/sickness/maternity etc. (although hours are harder to measure accurately). Higher employment rates are easier to interpret as a desirable social outcome than higher hours per capita, however, as - all else equal - workers would prefer more vacations and a shorter working day. Given the ambiguity of which decomposition is "better", we present both.

Figure 2 presents the first decomposition using GDP per worker as a measure of productivity. Panel A shows that the UK's GDP per worker growth was as fast as that in the US between 1997 and 2008 which is impressive as these are the years of the US "productivity miracle" (Jorgenson, 2001). So the UK managed to hold the tail of the US tiger. US productivity has outstripped that in the UK in the Great Recession which reflects the much more aggressive job shedding in the US in response to the downturn. UK productivity growth was better than Continental Europe, however. Again, the UK productivity performance was also strong in the pre-1997 period – in fact, during the 1979-1997 - under the Conservatives - UK GDP per worker grew faster than both the US and France.

Panel B of Figure 2 shows employment rates. Over the period 1997-2007 the growth of the employment rate in the UK was similar to that in France and Germany. The US, by contrast had a very poor jobs performance with the employment rate falling by nearly 5% by 2008 before plummeting in the Great Recession. This is reflected in the fact that US unemployment rates rose from 5% to almost 10% whereas in the UK the increase in unemployment was more modest (currently about 8%) despite a larger fall in GDP. In Germany, unemployment has hardly risen at all. The UK's employment rate was similar at the beginning and at end of the Conservative period, not rising like in the US, but not falling like in France. What is more striking is how volatile the jobs market was, with a huge boom in the late 1980s and busts in the early 1980s and early 1990s. Figure 3 repeats the analysis for productivity measured in hours instead of workers and shows broadly similar trends to Figure 2. In general, the UK productivity position looks weaker compared to the EU on a per hour basis as UK hours per worker are higher. For example, although Figure 2 showed that UK GDP per worker both pre and post Labour was faster than France, Figure 3 shows that France had faster growth of GDP per hour than the UK in the Conservative period.

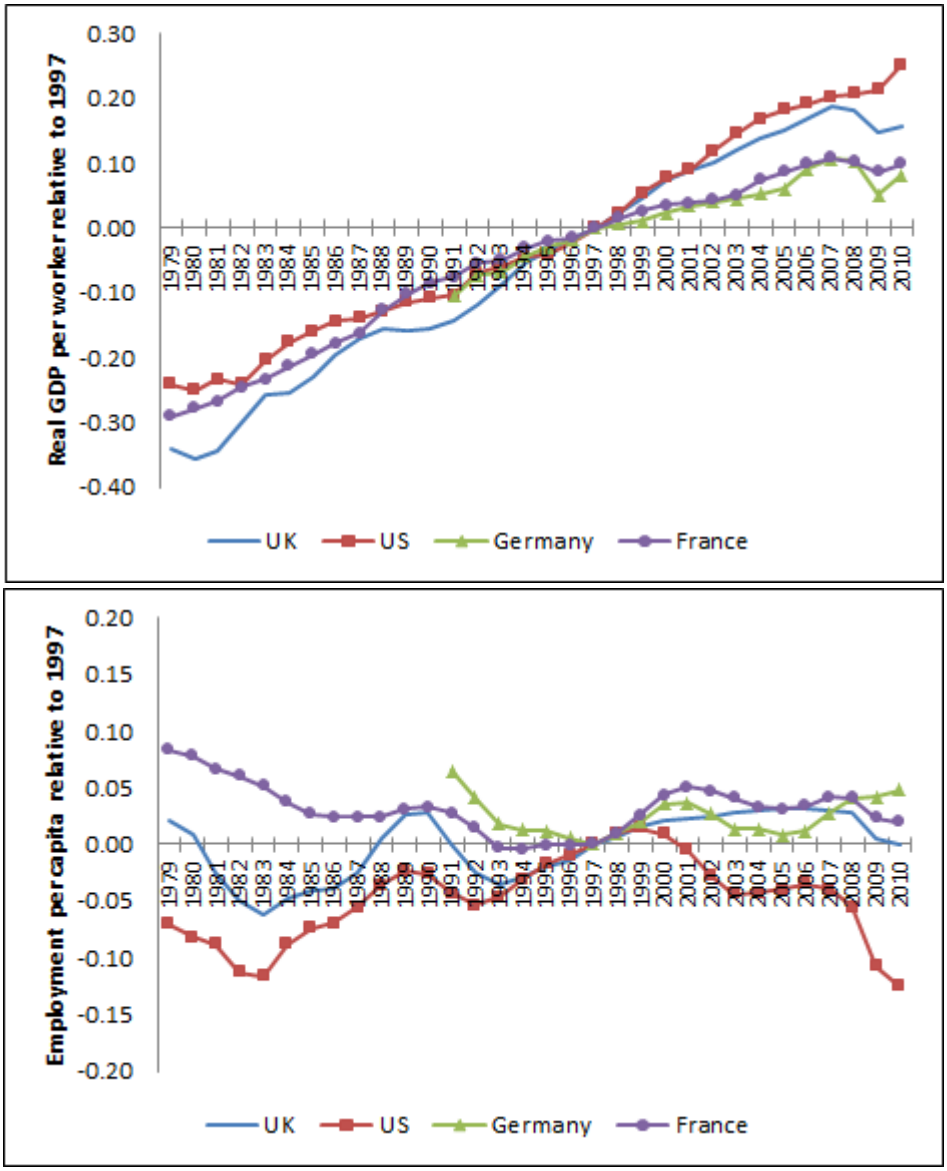
This analysis gives a fairly clear story of Britain's performance under Labour. GDP per capita outstripped the other major economies because the UK did well in terms of both productivity (only a little worse than the US and better than EU) and the labour market (better than the US and only a little worse than the EU). This was a solid performance, contrary to what general discussion about the period suggests. However, it is also true that the UK also did well in terms of productivity in the Conservative years of 1979-1997, so the UK performance is more likely a continuation of a post 1979 trend rather than a sharp break with the past. Taking an even longer run perspective we see in Table A5 that 1979 appeared to be a break in the UK's declining relative performance. For example, German GDP per head was 58% of the UK level in 1870 and American productivity 77%. Just over a century later (1979) Germany had 16% higher productivity than the UK and he US was 43% higher. By 2007, however, the UK had closed all the gap with Germany and was only 33% behind the US.

In Appendix 1 we consider Britain's *relative* economic performance in greater detail[3]. When the US is used as a benchmark, GDP per capita caught up more quickly under Labour than under the Conservatives (because of better labour market performance). By contrast, when France is used as a benchmark, GDP per capita caught up more quickly under the Conservatives. The main point, however, is that Britain did well in its macroeconomic performance compared to its peers throughout the post 1997 period.

[3] We note that the growth rates shown in column 1 of Table A.1 and A.3. do not correspond exactly to the GDP per adult growth rates in Table 1. This is because in the appendices, these are calculated using a linear regression of the log of the series on a time trend and a constant. Table 1 reports cumulative annual growth rates which use the start and end year only.

Figure 2: Trends in real GDP per worker and employment per capita (adult) relative to 1997

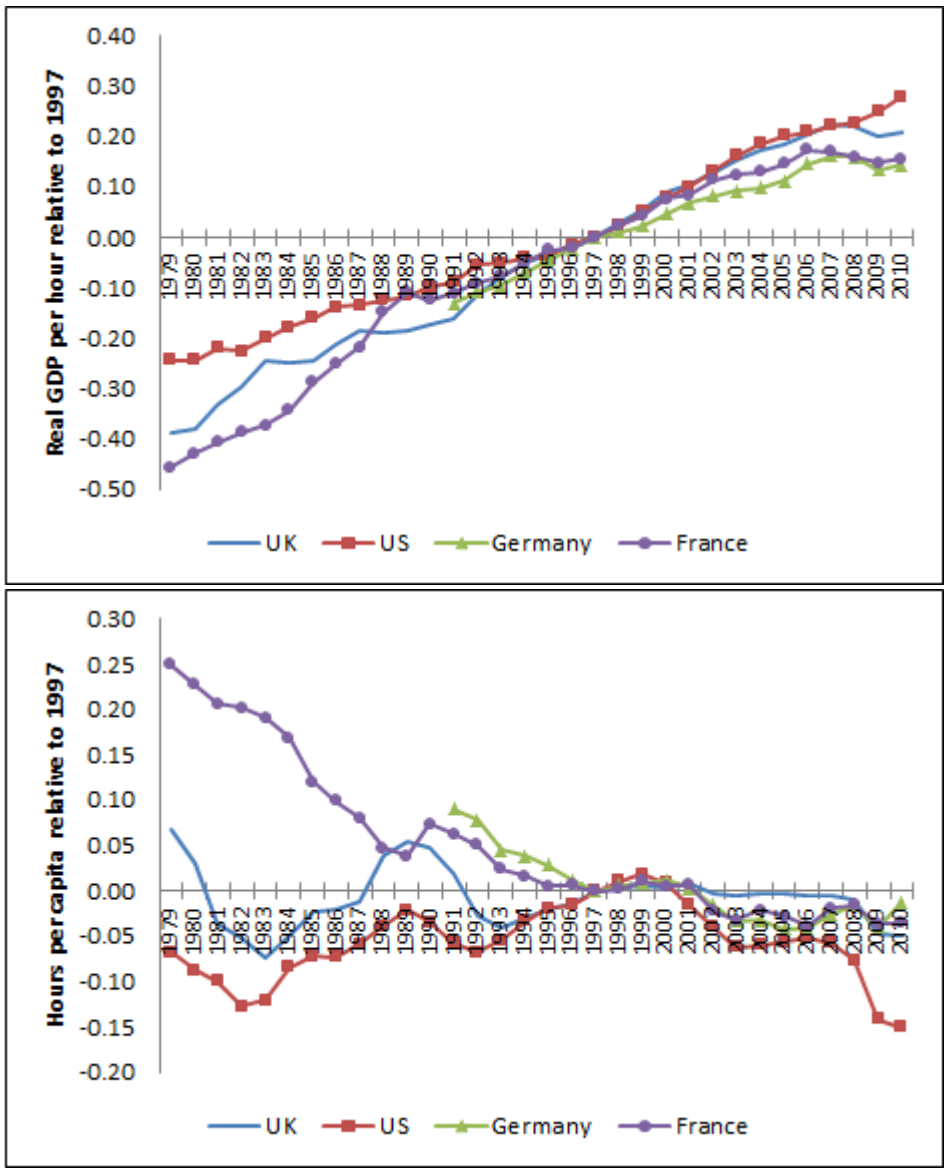
Panel A: GDP per employee, Panel B: Employment per capita



Notes: Analysis based on OECD data (extracted on 28 Oct 2011 from OECD.Stat). GDP is US$, constant prices, constant PPPs, OECD base year (2005) from GDP database. Employment data from OECD productivity database. Adult refers to "working age adults", obtained from US Bureau of Labour Force Statistics, and includes the civilian non-institutional population aged over 16. Data for Unified Germany from 1991. Workers are all persons engaged. For each country the logged series is set to zero in 1997, so the level of the line in any year indicates the cumulative growth rate (e.g. a value of 0.1 in 2001 indicates that the series has grown by exp(0.10)-1=11% between 1997 and 2001). The steeper the slope of the line, the faster growth has been over that period.

Figure 3: Trends in real GDP per hour and hours per capita (adult) relative to 1997

Panel A: GDP per hour, Panel B: Hours per capita



Notes: Analysis based on OECD data (extracted on 28 Oct 2011 from OECD.Stat). GDP is US$, constant prices, constant PPPs, OECD base year (2005) from GDP database. Hours data from OECD productivity database. Adult refers to "working age adults", obtained from US Bureau of Labour Force Statistics, and includes the civilian non-institutional population aged over 16. Data for Unified Germany from 1991. Total hours are those worked by all persons engaged. For each country the logged series is set to zero in 1997, so the level of the line in any year indicates the cumulative growth rate (e.g. a value of 0.1 in 2001 indicates that the series has grown by exp(0.1)-1=11% between 1997 and 2001). The steeper the slope of the line, the faster growth has been over that period.

1.3 Where Did the Growth in UK Productivity Come From?

Introduction

We now turn to the exercise of accounting for what lies beneath these aggregate trends in UK productivity. Rigorous and comparable cross-national data at the industry level is not currently available after 2008, so we first focus on the period up until the Great Recession (Section 4 analyses the Great Recession period using the most recent available UK data and is, by necessity, more provisional). For these purposes we use the KLEMS database [4] (Timmer, 2007), which is the best available source of harmonised productivity data (at the time of writing, October 2011) for the major countries that we want to look at. It is consistent with national accounts, describes all assumptions made and contains comparable data on education by industry (which is important for labour quality measurement)[5].

We consider two ways to decompose growth. First, we look at the contributions of the "factor inputs" to growth – i.e. the quantity and quality of capital and labour. Second, we examine the contributions of various industries to the aggregate productivity performance of the UK and its key comparators. Broadly we find that during Labour's period, overall labour productivity growth was similar to that in the previous Conservative period, but its composition changed – human capital and ICT (information and communication technologies) accounted for more of the growth. Low tech capital became less important and overall efficiency growth (called "Total Factor Productivity" or TFP) remained at about 1% throughout. Perhaps the most striking fact we will discuss is that looking at sectors, finance was *not* responsible for much productivity growth (around 14%), implying that finance was unlikely to be the main cause of the strong productivity performance[6].

Decomposing growth into factor inputs: The growing importance of skills and computer technologies

A full growth accounting exercise for the UK's total economy, split into main sectors is present in Appendix 2 (the same analysis is reproduced for the US for comparison). We summarize the results in this sub-section primarily focusing on the "market economy" as defined by KLEMS, which strips out the public sector and real estate. For the public sector, value added is particularly hard to measure (we discuss these non-market economy sectors below), and international comparisons are therefore problematic. Real estate is excluded because output in this industry mostly reflects imputed housing rents rather than the sales of firms, consequently residential buildings are also excluded from the market economy capital stock (Timmer et al., 2010). In the UK, the market economy makes up around three quarters of the total economy, slightly less in the comparator countries (see Figure 4). Carrying out

[4] This is available at http://www.euklems.net/. See O'MAHONY, M. & TIMMER, M. P. 2009. Output, Input and Productivity Measures at the Industry Level: The EU KLEMS Database. *Economic Journal*, 119**,** F374-F403.

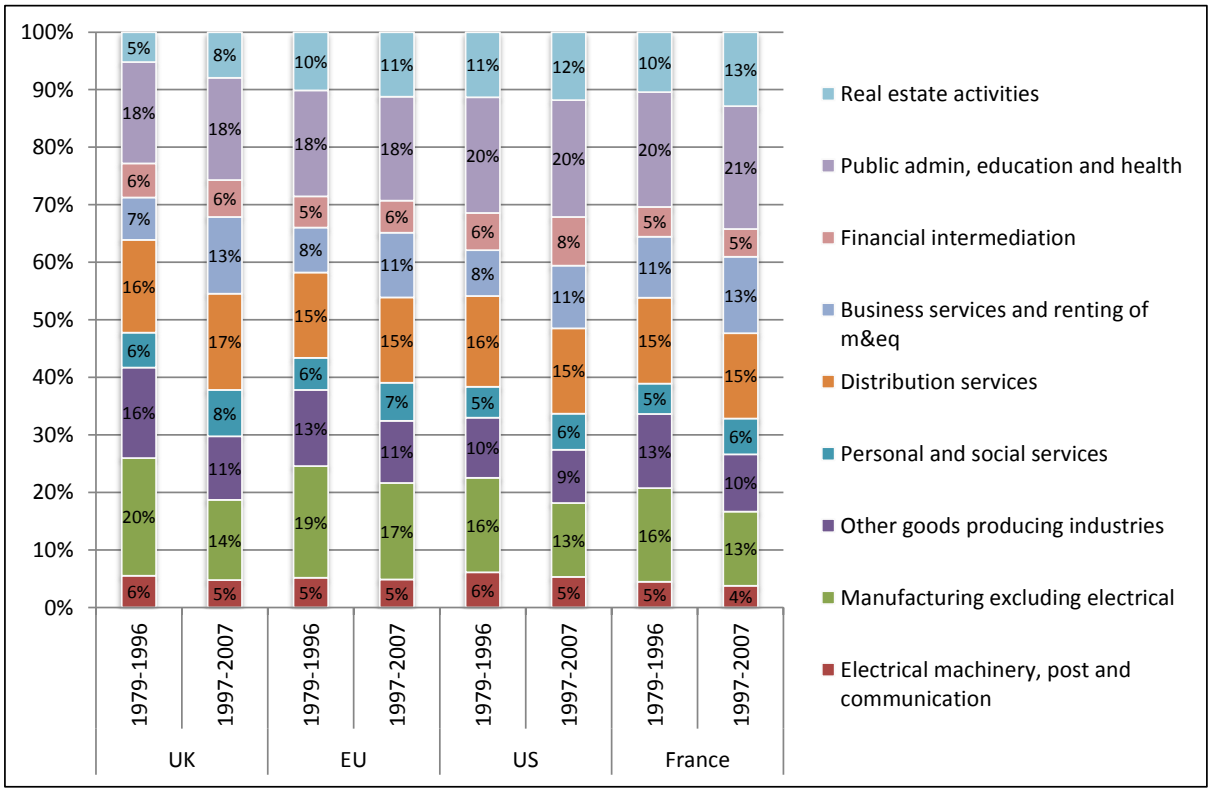
[5] The OECD also has a similar database, STAN, but this does not include education data and it is harder to track through some of the assumptions used (and how they have changed over time). We use the 1.0 version because the 2.0 version of KLEMs is still under construction.

[6] Furthermore, it is worth noting that the aggregate GDP growth numbers are not affected by mis-measurement of the output of the investment banks "toxic assets" (such as Mortgage Backed Securities, CDO^2, etc.). This is because national accounts look at annual growth using an expenditure-based GDP rather than the output-based measure of GDP. The "toxic rubbish" part of the banking sector are all classified as intermediate inputs sold to non-financial businesses, so do not really show up as GDP. The exception is net exports where "toxic rubbish" could show up. But this is in total only 1.5% of GDP, so even this would make only a minor contribution to growth even if all of the net exports could be placed in this category. The contribution of finance to GDP is from plain vanilla banking services sold to households.

this analysis for Gross Value Added[7] (GVA) as our measure of output, we find that a similar picture of strong UK performance emerges as with the GDP numbers in Table 1.

Figure 4 shows how aggregate value added splits between different sectors since 1979. In all countries, there has been a strong trend away from manufacturing and other goods producing sectors and towards services. But this trend is particularly strong in the UK with a shift towards business services (its share of aggregate value added rises from 7% to 13%).

Figure 4: Sector shares of total economy GVA



Notes: Data: EU KLEMS. EU represents all EU-15 countries for which growth accounting could be performed, i.e. AUT, BEL, DNK, ESP, FIN, FRA, GER, ITA, NLD & UK. Data for France and the EU are available from 1981 onwards. Market economy only.

Significantly, Figure 4 shows that the growth in the public sector, finance and real estate sectors between the Conservative and the Labour periods has been less than often imagined. Financial intermediation is about 6% of aggregate value added in both periods and the public sector (public administration, health and education) also remains constant at 18% of value added. Real estate activities have grown, but only from 5% to 8%. According to Figure 4 the size of the market economy was only three percentage points smaller under Labour that in the previous period. This fall was less than in France (4 percentage point fall) but more than in the US and EU as a whole (1 percentage point fall).

We now focus on the market economy. Table 2 shows a decomposition of average annual growth in value added showing that the UK enjoyed overall growth of 3.2% over 1997-2007 only slightly behind the US (3.4%), and much faster than the EU average (2.5%) and France (2.6%). In addition, this was faster than the pre-1997 period, when the average annual growth rate was 2.3%. However, this performance was largely due to the contribution of total hours worked (driven by rising employment). If we strip out the contribution of hours to UK growth

[7] GVA + taxes on products - subsidies on products = GDP

of 0.4%, we are left with labour productivity growth of 2.8%, very similar to the pre-1997 period of 2.7%.

Despite this constancy on the surface, the composition of UK productivity growth changed between the two periods. The contribution of each factor input is the product of growth in that input and its share in value added, while the contribution of TFP (Total Factor Productivity – a measure of technical change) is calculated as a residual. The labour composition index takes into account differences in the composition of the workforce in terms of skills, gender and age[8].

The numbers are detailed in Table 2 and shown graphically in Figure 5. Although TFP growth was similar at about 1% p.a in both periods, the contribution of labour composition and ICT capital increased in importance post 1997 and the contribution of non-ICT capital has fallen. Overall, contribution from the "knowledge economy" (labour composition, ICT capital and TFP) has increased in the UK from 2 to 2.3%, compared to a fall in the EU and a larger increase in US driven mainly by higher TFP growth[9].

Table 2: Decomposition of growth in value added, market economy

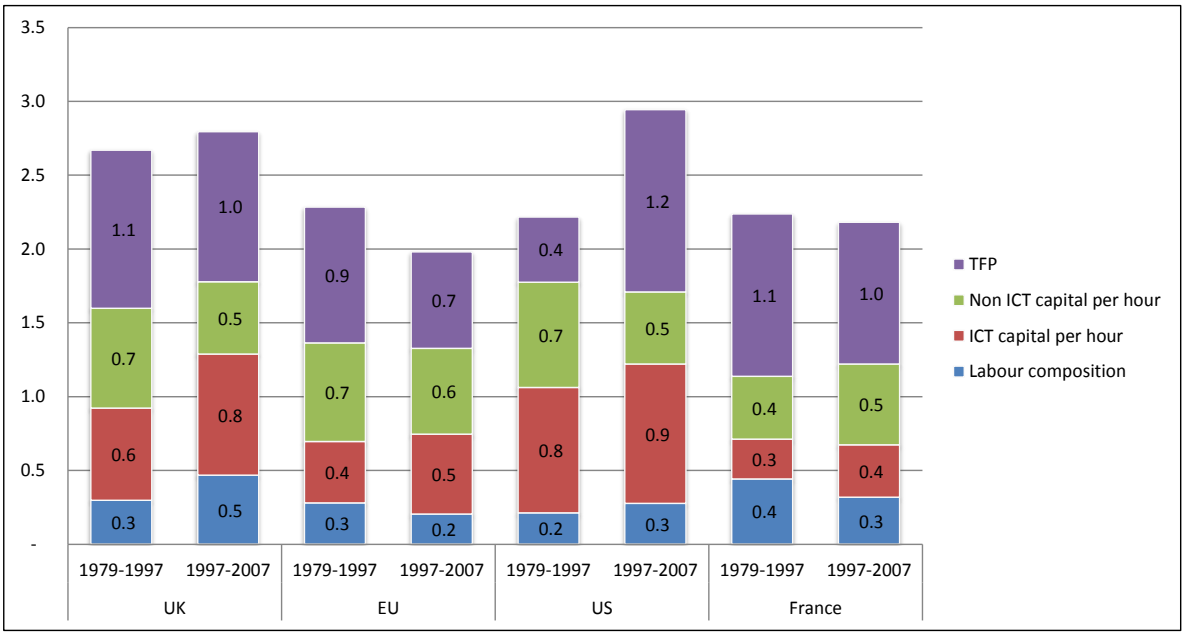
		UK		EU		US		France	
		1979-1997	1997-2007	1979-1997	1997-2007	1979-1997	1997-2007	1979-1997	1997-2007
1	Market economy output (2+3)	2.3	3.2	2.1	2.5	3.2	3.4	1.8	2.6
2	Hours worked	-0.4	0.4	-0.2	0.5	0.9	0.5	-0.4	0.4
3	Labour productivity (4+5+6+7)	2.7	2.8	2.3	2.0	2.2	2.9	2.2	2.2
	Contributions from								
4	Labour composition	0.3	0.5	0.3	0.2	0.2	0.3	0.4	0.3
5	ICT capital per hour	0.6	0.8	0.4	0.5	0.8	0.9	0.3	0.4
6	Non ICT capital per hour	0.7	0.5	0.7	0.6	0.7	0.5	0.4	0.5
7	TFP	1.1	1.0	0.9	0.7	0.4	1.2	1.1	1.0
8	Contribution from knowledge economy (4+5+7)	2.0	2.3	1.6	1.4	1.5	2.5	1.8	1.6

Notes: Data: EU KLEMS. EU represents all EU-15 countries for which growth accounting could be performed, i.e. AUT, BEL, DNK, ESP, FIN, FRA, GER, ITA, NLD & UK. Data for France and EU are available from 1981 onwards.

[8] See O'MAHONY, M. & TIMMER, M. P. 2009. Output, Input and Productivity Measures at the Industry Level: The EU KLEMS Database. *Economic Journal,* 119**,** F374-F403. This explains the construction of the labour composition component in EU KLEMS, which depends on skills (measured by educational attainment), age and sex of the workforce. Timmer et al (2010) explain that the impact of an ageing population (which implies higher wage workers) and the increasing employment of females (who tend to be paid less) tend to counterbalance each other. Hence trends in labour composition tend to be dominated by changes in skill composition.

[9] Timmer et al (2007) note that while the use of educational attainment as a measure of skill may lead to difficulties with cross-country comparisons (since educational systems, classifications and quality vary between countries), it is useful for tracking developments over time within the same country.

Figure 5: Sources of labour productivity growth, market economy



Notes: Data: EU KLEMS. EU represents all EU-15 countries for which growth accounting could be performed, i.e. AUT, BEL, DNK, ESP, FIN, FRA, GER, ITA, NLD & UK. Data for France and EU are available from 1981 onwards. ICT = Information and Communication Technology and TFP = Total Factor Productivity.

Which sectors are responsible for productivity growth? It wasn't all a financial bubble

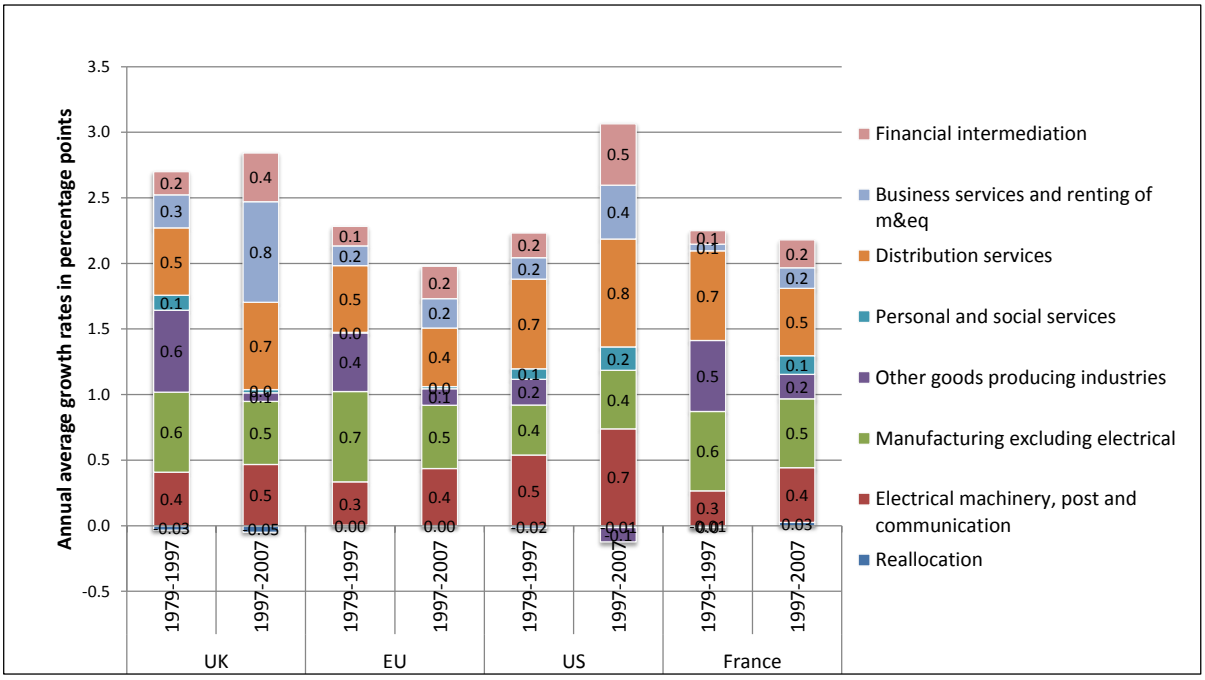
The second growth decomposition we implement is to look at the contribution of different sectors to aggregate productivity. Appendix 2 shows the full growth accounting exercise by sector. This shows that the highest productivity growth sectors over the 1997-2007 period were electrical machinery, post and communication, financial intermediation, business services and distribution (in descending order). These sectors saw high contributions from both ICT capital per hour and TFP.

However, a sector's contribution to overall market economy productivity growth depends on both its productivity growth and its size (share of total market economy GVA). Nationwide aggregate productivity growth can increase either because a sector increases productivity ("within effect") or a high productivity sector grows in size at the expense of a low productivity sector ("between effect"). Figure 6 shows the breakdown by broad sector, calculated by multiplying the average productivity growth of a sector by its average share in GVA over the corresponding period (the calculations underlying this are present in Appendix 3, Table A.8) [10]. Interestingly, financial intermediation was responsible for only 0.4 percentage points of the 2.8 percentage points annual growth in productivity under Labour. Accounting for 14% (= 100*0.4/2.8) of productivity growth with only 9% of the market economy value added is no small achievement, but this sector *already* accounted for 0.2 percentage points of the growth under the Conservatives (when it constituted 8% of market

[10] We note that we are using a methodology that is consistent with the use of KLEMS data in Timmer et al (2010), Van Ark et al (2008) and Timmer et al (2007) who look at the periods 1980-1995 and 1995-2004 or 2005. Using a different approach, and apportioning GVA growth to sectors over 2000-2007, Dal Borgo et al (2011), find similar results in terms of the relative contributions of the different sectors to aggregate VA growth. Of the total growth of 2.83%, 0.31p.p relates to financial services, with larger contributions coming from Distribution (0.88p.p) and Business Services (0.55p.p). See DAL BORGO, M., GOODRIDGE, P., HASKEL, J. E. & PESOLE, A. 2011. Productivity and Growth in UK Industries: An Intangible Investment Approach. *Imperial College*.

economy value added). And this leaves 86% of aggregate market economy growth due to other sectors. Further, the contribution of finance also increased in other economies: its contribution more than doubled in the US over the same periods (from 0.2 to 0.5) and doubled in the EU as a whole (0.1 to 0.2). So the idea that all of the productivity growth in the UK relative to others was due to a bubble in finance does not seem to square with this evidence. Furthermore, if we exclude the effect of finance altogether, productivity growth in the UK would have been broadly constant at around 2.5% per annum in the pre and post-1997 periods[11].

Figure 6: Sector contributions to market economy productivity growth



Notes: Analysis based on EU KLEMS data. EU represents all EU-15 countries for which growth accounting could be performed, i.e. AUT, BEL, DNK, ESP, FIN, FRA, GER, ITA, NLD & UK. Data for France and EU are available from 1981 onwards. Average sectoral growth rates for the periods 1979-1997 and 1997-2007 are weighted by each sector's average share in market economy nominal GVA over the relevant period. The reallocation effect refers to the labour productivity effects of reallocations of labour between sectors that have different productivity levels.

Although the productivity growth performance does not seem directly attributable to the "bubble" sectors of finance, property and the public sector, there could be some other indirect mechanism. Could productivity in business services, for example, all be driven by the demands from financial services? This seems somewhat unlikely, as many parts of business services (e.g. consultancy and legal) are serving primarily non-financial firms. A more subtle argument is that the financial bubble created a kind of unsustainable excess consumption

[11] Note that we weight the sector contributions to productivity growth using nominal GVA to be consistent with the KLEMS growth accounting methodology. We also experimented with weighting by GVA share in constant prices, and by share of employment (not reported here). The picture does not change much and business services remain the sector with the largest increase in contribution between the pre and post-1997 periods. When we use constant prices GVA, we see that electrical machinery, post and communication, a sector that has seen productivity gains of 7.2% (Appendix 2), makes a larger contribution, due to the fact that prices in the sub-sectors have fallen in recent years (following technology improvements and the impact of competition and regulation in the telecoms and postal sectors) and hence a smaller share in current price GVA compared to constant price GVA. When we use sector shares in employment we see that electrical machinery, post and communication makes a much smaller contribution as these are not labour intensive sectors.

demand that was propping up fundamentally inefficient companies. However, (Giles, 2011c) shows that the data does not support the assertion that there was a great consumer boom before the financial crisis. In fact, there was a drop in household consumption as a share of national income, from 63.3% in 2002 to 61.3% in 2007. Furthermore, even if this consumption bubble story were true, it is unlikely that this would artificially inflate productivity. A general bubble would increase output and employment hours (temporarily) above their sustainable levels. But it is unclear why this would flatter the productivity numbers. In fact, if generally unproductive activities were being drawn in, this would be more likely to lower measured productivity.

We return to this issue in Section 4 when evaluating the situation of the economy since 2008.

The role of non-market sectors

Our focus has been on the market economy, but one could also perform a growth accounting exercise for health, education, public administration activities and real estate (see Appendix 2). This is unlikely to be very reliable because output is extremely hard to measure in these primarily public service activities (Timmer et al., 2010) with productivity growth assumed to be zero in most sectors and in most countries. Nevertheless taking this for a moment at face value, we find that UK output growth in the non-market sectors was greater in the Labour period than under the Conservatives, but that labour productivity growth fell from 0.6% pa to zero. Other EU countries also experienced a decline (but not the US). This appears to be largely due to negative TFP growth which affected all countries but was strongest in the UK (see Table 3).

This is consistent with the story that the large increase in public services expenditures led to a fall in productivity in these sectors. For example, even after improvements in measurement following the Atkinson Review (2005), NHS productivity appears to be at best flat. Undoubtedly, low productivity in the public sector is a major problem and there is much debate over whether Labour's much-delayed reforms to public services had any effect on efficiency. We discuss public sector productivity in more detail in Section 5 and show some evidence that some of the reforms did raise productivity (e.g. in healthcare).Nonetheless, as we discussed in the first section even including (measured) public services, aggregate productivity performance of the UK was second only to the US since 1997.

Table 3: Decomposition of growth in value added, public admin, education and health

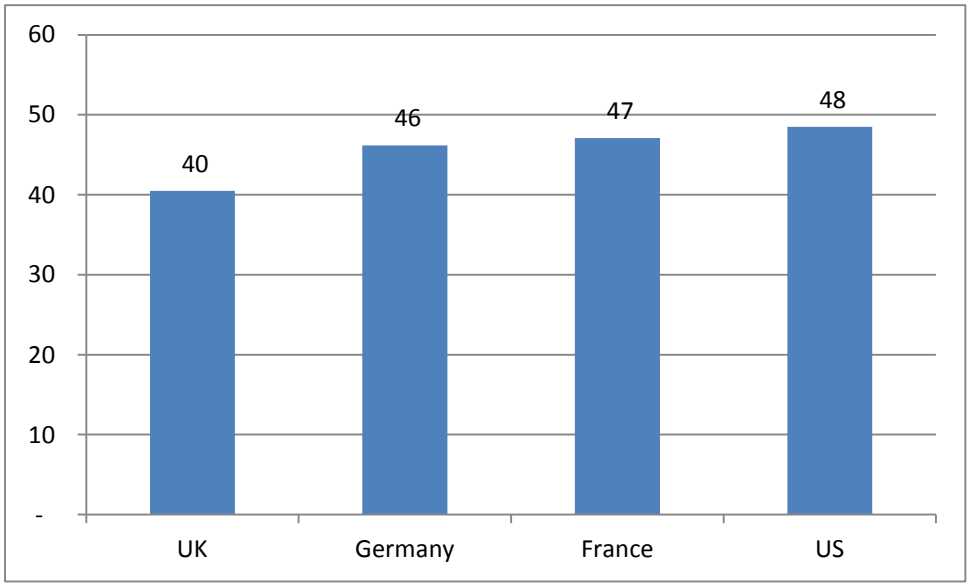
		UK		EU		US		France	
		1979-1997	1997-2007	1979-1997	1997-2007	1979-1997	1997-2007	1979-1997	1997-2007
1	Output (2+3)	0.9	1.5	1.8	1.5	1.4	1.7	2.2	0.8
2	Hours worked	0.3	1.5	0.8	0.8	1.5	1.4	1.0	0.4
3	Labour productivity (4+5+6+7)	0.6	0.0	1.0	0.7	-0.1	0.3	1.2	0.4
	Contributions from								
4	Labour composition	0.6	0.6	0.3	0.3	0.3	0.3	0.4	0.2
5	ICT capital per hour	0.3	0.2	0.2	0.2	0.3	0.4	0.1	0.2
6	Non ICT capital per hour	0.2	0.1	0.3	0.3	0.6	0.5	0.3	0.3
7	TFP	-0.5	-0.9	0.2	-0.1	-1.4	-0.9	0.4	-0.3
8	Contribution from knowledge economy (4+5+7)	0.4	-0.1	0.7	0.4	-0.8	-0.2	0.9	0.1

Notes: Data: EU KLEMS. EU represents all EU-15 countries for which growth accounting could be performed, i.e. AUT, BEL, DNK, ESP, FIN, FRA, GER, ITA, NLD & UK. Data for France and EU are available from 1981 onwards.

Productivity levels

Although the UK's overall productivity growth has been strong, it is worth recalling that productivity in terms of levels still lags behind other countries despite the gap narrowing since the early 1990s. Over the 2000s, UK GDP per hour worked was 17% below the US in 2010, 14% lower than France and 12% lower than Germany (see Figure 7).

Figure 7: Labour productivity levels, GDP per hour, average over 2000-2010 (2005 $ PPP)



Notes: Analysis based on OECD data (extracted on 28 Oct 2011 from OECD.Stat). GDP from GDP database, hours data from OECD productivity database. GDP is US$, constant prices, constant PPPs, OECD base year (2005).

1.4 Summary on Overall UK Economic Performance since 1997

Since 1997 UK economic performance has been strong compared to other countries, and this continues a historical trend which began after 1979 with Mrs Thatcher. GDP per capita grew faster than the other G6 nations between 1997 and 2010 with productivity growth second to only the American "productivity miracle". This UK performance was due to a continued rapid rate of TFP growth and an increasingly important role for skills and ICT. Importantly, the performance was *not* primarily driven by finance which contributed only around 0.4% of the 2.8% productivity growth in the market sector during the Labour period (compared to 0.2% of the 2.7% productivity growth under the Conservatives). Business services and distribution were much more important sectors. The growth in hours in the non-market sector due to rising government expenditure and a property boom held aggregate productivity back, but not enough to make much of a change in Britain's relative growth position (see Table 1).

2. Other Measures of Business Performance

2.1 Introduction

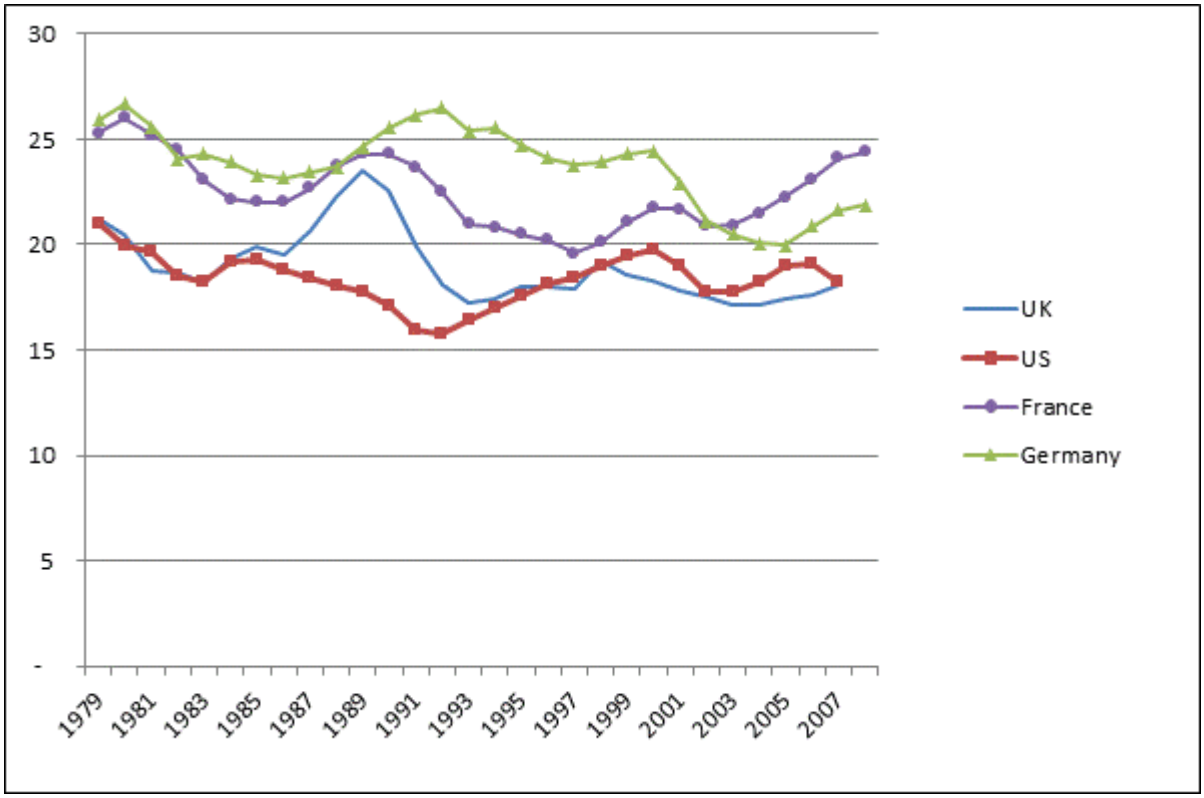
We have focused on productivity because, for economists, this is the key measure of long-run performance. In this section we present a short tour of other indicators of business performance (including regional inequality). This is more of a mixed bag, but overall our sense is that these alternative indicators support a continuation of the positive trends in business performance since 1997, but with many remaining problems of the levels of performance relative to other countries. We investigate investment (domestic and foreign direct), innovation, management, skills, entrepreneurship, exports, profits and regional differences. Data constraints prevent us from implementing the fully consistent analysis of all of these performance measures of the UK relative to other countries before and after Labour, but we use the data available where we can.

2.2 Analysis of Key Indicators

Investment

In sub-section 1.3 we showed the importance of investments in ICT and non ICT capital to productivity growth. The contribution of ICT capital to growth was nearly as high in the UK as in the US (and higher than the EU), and the contribution of non-ICT capital in the UK was the same as the US in both the pre and post-1997 periods. However, when we look at the levels of total investment, standardised as a percentage of value added, UK levels are consistently lower than France and Germany, but similar to the US (Figure 8). In the post-1997 period, average UK investment was 17.9% of value added compared to 18.7% in the US, 21.8% in France and 22.1% in Germany.

Figure 8: Total economy investment as a share of GVA (%)

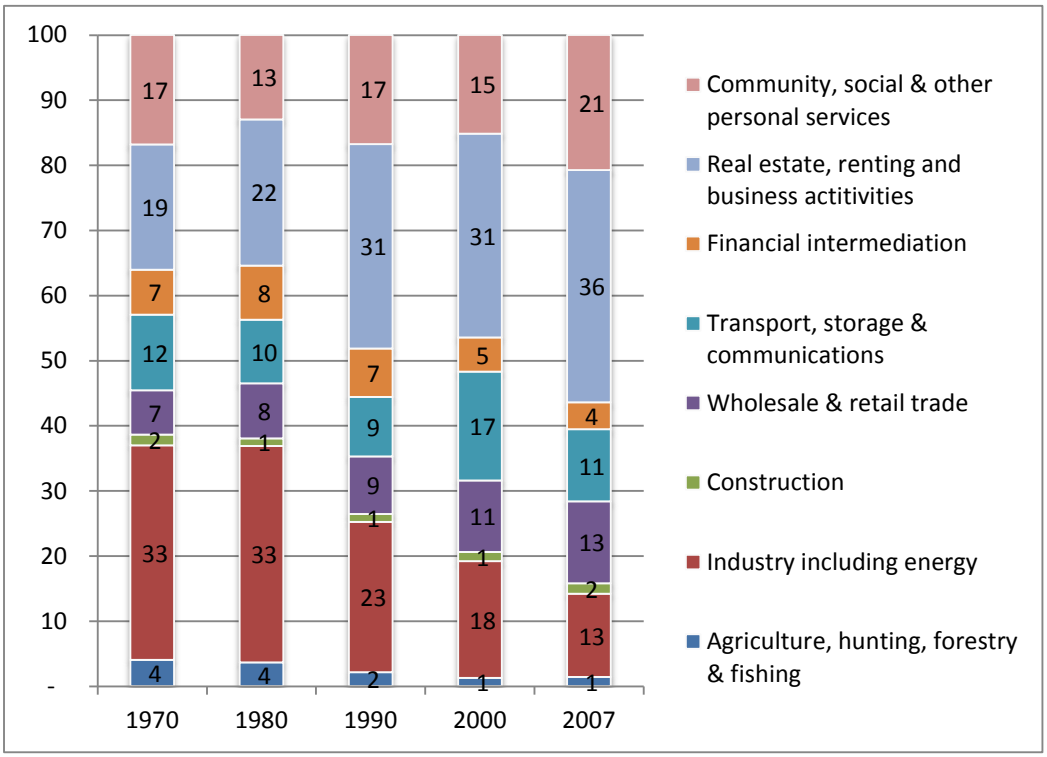


Notes: OECD STAN database. Investment intensity is calculated as the ratio of gross fixed capital formation to value added.

The more favourable performance of the UK in the late 1980s was mainly driven by real estate during the Lawson boom as shown by Figure 9, which gives the sector breakdown of total investment. Indeed, the largest share for the most part has related to real estate[12].

[12] The split between real estate and renting and business activities is only available from the early 1990s, but most of this overall investment consists of real estate activity.

Figure 9: Sector shares of total investment (%)



Notes: OECD STAN database. Investment share represents investment composition of the total economy. It is calculated by dividing each industry's gross fixed capital formation by gross fixed capital formation for the total economy.

The classic interpretation problem with investment is whether it is "too low" in the Anglo-Saxon countries because of access to finance, short-termism, low public investment or "too high" in Continental Europe due to (for example) high minimum wages and union bargaining power. In either case, things have not changed much over time.

Foreign Direct Investment

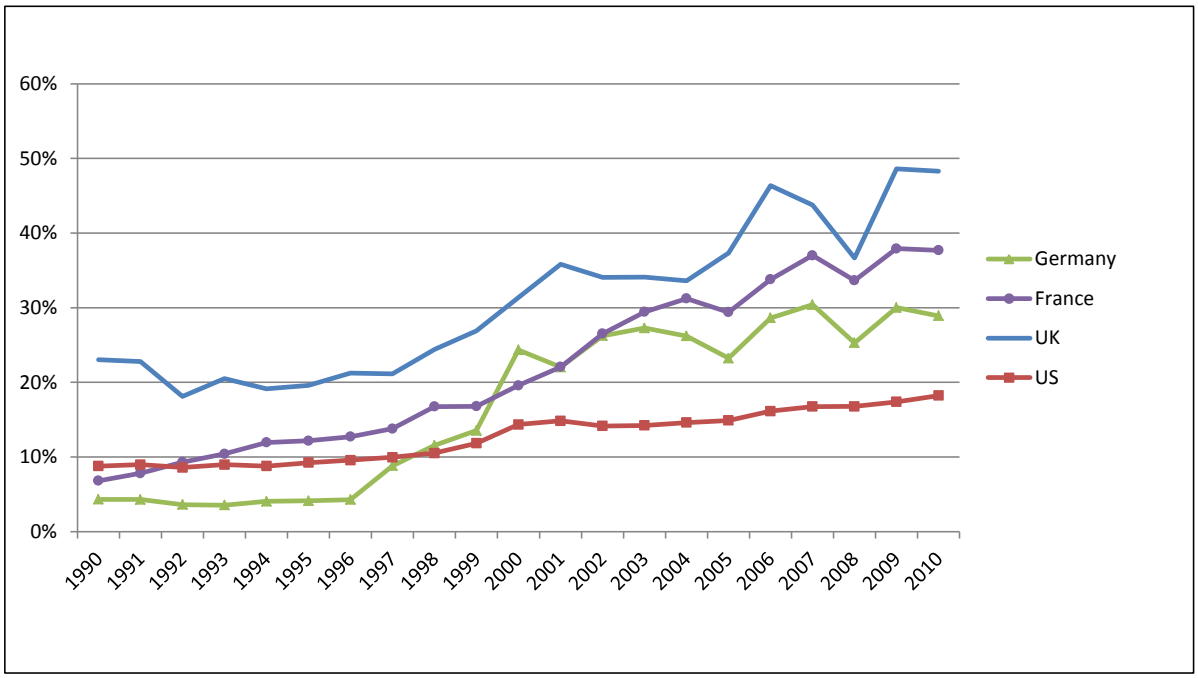
Foreign Direct Investment (FDI) may be important for two reasons. First, it is a signal of the success of the UK in attracting overseas firms. Second, FDI may bring new technologies and modern management practices as well as stimulating greater competition (Bloom et al., 2011b). These mechanisms mean that FDI may create positive spillovers raising the productivity of domestic firms[13].

The UK has been successful at attracting FDI, with inward FDI stocks higher than comparators both pre and post-1997 as shown in Figure 10 (unfortunately, OECD data is not available on a consistent basis pre 1990). All countries shown have grown between 1997 and 2010, with Germany showing the highest cumulative annual growth rate of 10%, compared to 7% for the UK. The relative acceleration witnessed in the UK, France and Germany may be due to the effects of European integration since the mid-1990s (the growth in US FDI stocks has been constant). UK FDI inflows appeared to be strongly pro-cyclical, picking up from

[13] The evidence on FDI spillovers is mixed (see HASKEL, J. E., PEREIRA, S. C. & SLAUGHTER, M. J. 2007. Does inward foreign direct investment boost the productivity of domestic firms? *Review of Economics and Statistics*, 89**,** 482-496.)

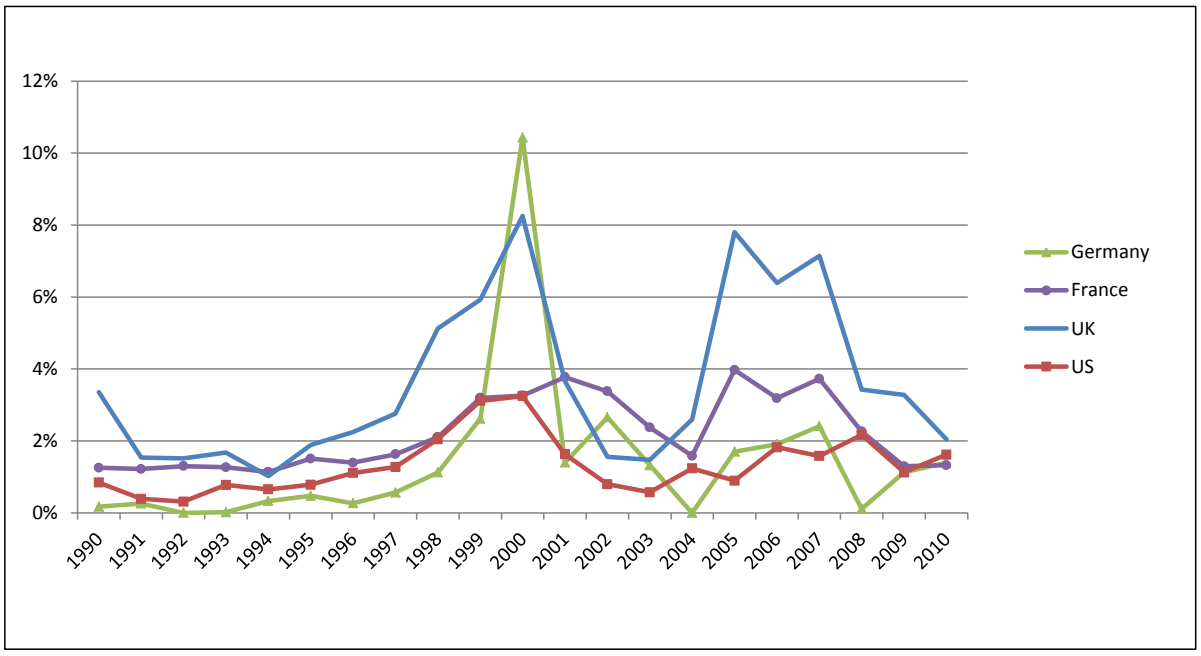
1997, reaching a peak of 8% of GDP in 2000 during the "dot com boom" before falling back to pre-1997 levels until another peak in the mid-2000s (see Figure 11)[14].

Figure 10: Inward FDI stocks (% GDP)



Notes: Analysis based on OECD data sourced from www.oecd.org/investment/statistics

Figure 11: FDI Inflows (% GDP)



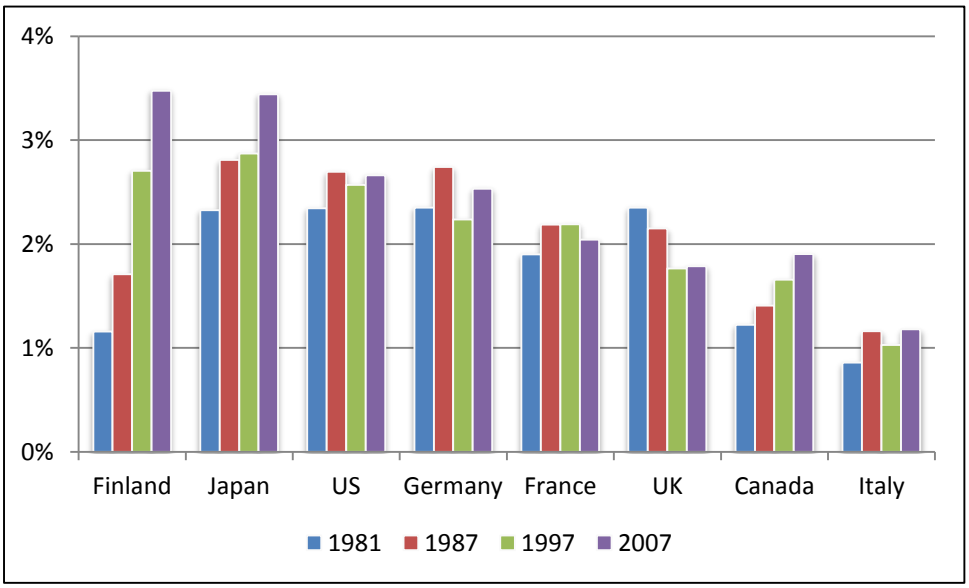
Notes: Analysis based on OECD data sourced from www.oecd.org/investment/statistics

[14] Outward FDI followed a similar pattern to inward FDI. The UK had higher outward FDI stocks than its comparators since the early 1990s, and these began to accelerate for the European countries. France saw the highest CAGR since 1997 of 10%, compared with 8% for the UK. FDI outflows follow a pro-cyclical pattern, with a peak of 16% of GDP in 2000, and another peak of nearly 12% of GDP just before the Great Recession.

Innovation

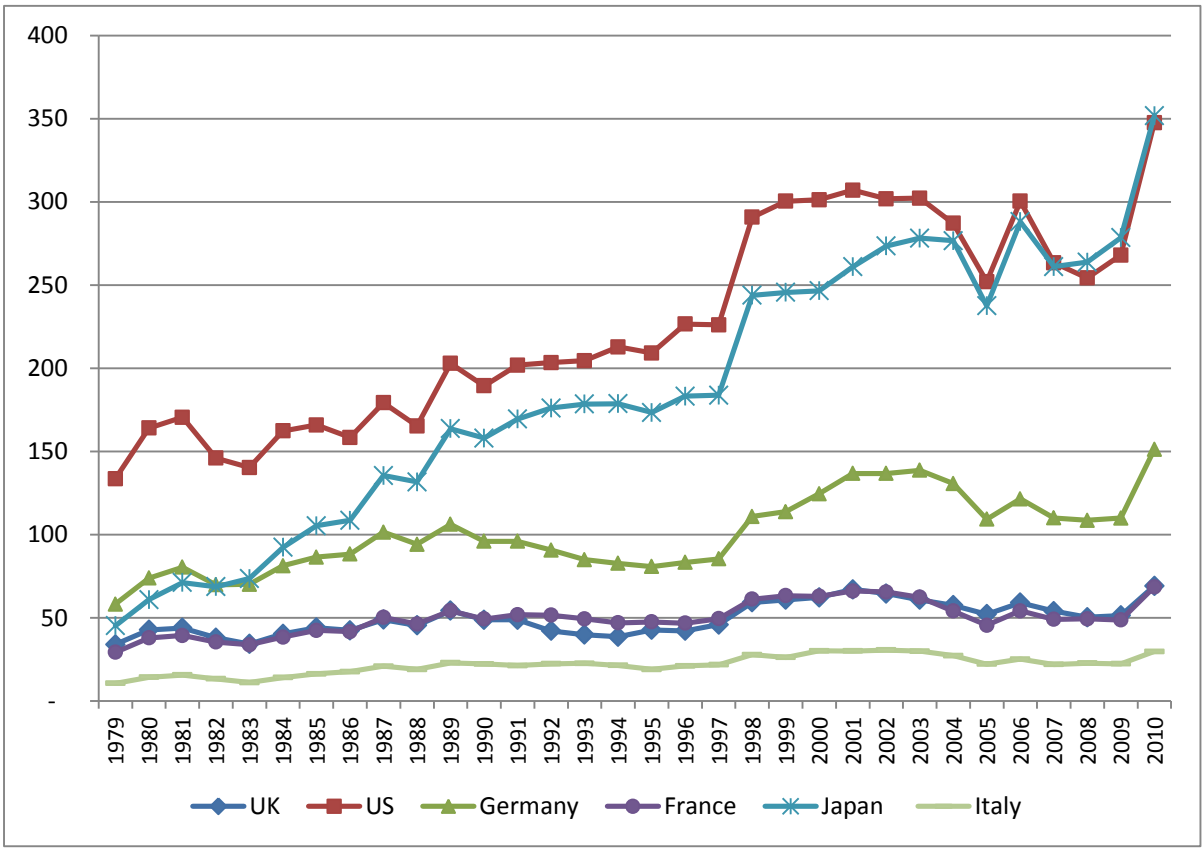
A standard measure of innovative inputs is R&D (business financed R&D makes up 62% of the total in the UK (BIS, 2010a)). R&D has increased slightly as a proportion of GDP between 1997 and 2008 after falling steadily since the late 1970s (Van Reenen, 1997). Still at 1.8% the ratio is lower than other major developed countries (see Figure 12). Similarly, the UK lags behind the US and Germany with respect to patents granted, though it has been tracking France since the 1990s (see Figure 13).

Figure 12: Gross domestic expenditure on R&D (GERD) (% GDP)



Notes: Analysis based on OECD MSTI June 2010 (data not available on a consistent basic prior to 1981)

Figure 13: USPTO patents granted, per million of the population

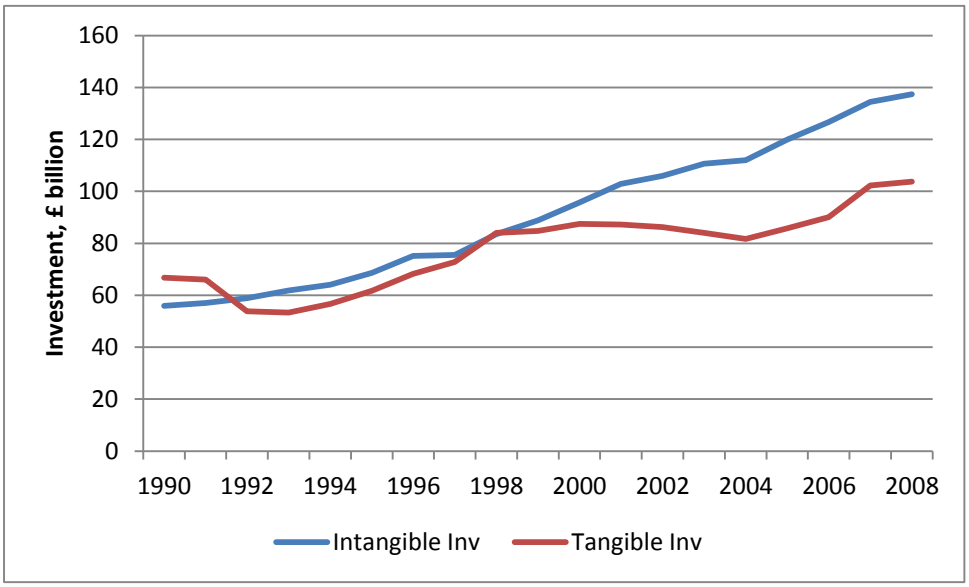


Notes: Data on patents granted from US Patent and Trade Mark Office, population data from OECD.

A wider view of intangibles should also be considered. These are difficult to measure and to compare across countries. On one set of recent data the inclusion of intangibles indicates that the UK had a higher share of value added in intangibles than all other G7 nations (BIS, 2010c). In addition to "traditional innovation" which refers to R&D, design and IP; "software development" and "economic competencies" are included (the latter comprises training, organisational development, marketing and branding). Capturing the intangibles gives a better view of the service sector's investment on innovation that is probably understated in the traditional Frascati-based measures of R&D. Other sources of intangible data however show the UK in a less favourable light compared to other countries (e.g. some OECD data).

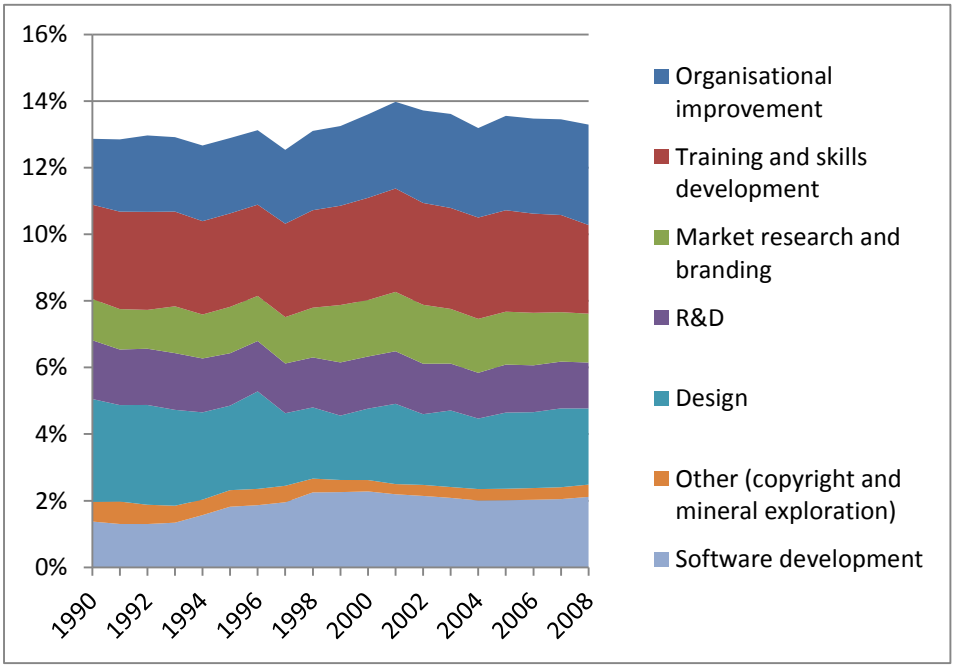
Intangible investment has been increasing over time (Figure 14). Nominal investments in intangibles have increased faster than tangible assets: the gap between these different types of investments has widened since 1998 such that by 2008 investments in intangibles were £34 billion higher than those of tangibles. We note however, that intangible investment as a share of market output (excluding government) remained broadly stable in recent years, as has its composition (Figure 15).

Figure 14: Investment by UK firms in intangible and tangible assets, 1990-2008



Notes: NESTA/BIS Annual Innovation Report 2010.

Figure 15: Investment by UK firms in intangible assets by category – share of market sector GVA, 1990-2008



Notes: NESTA/BIS Annual Innovation Report 2010.

Management

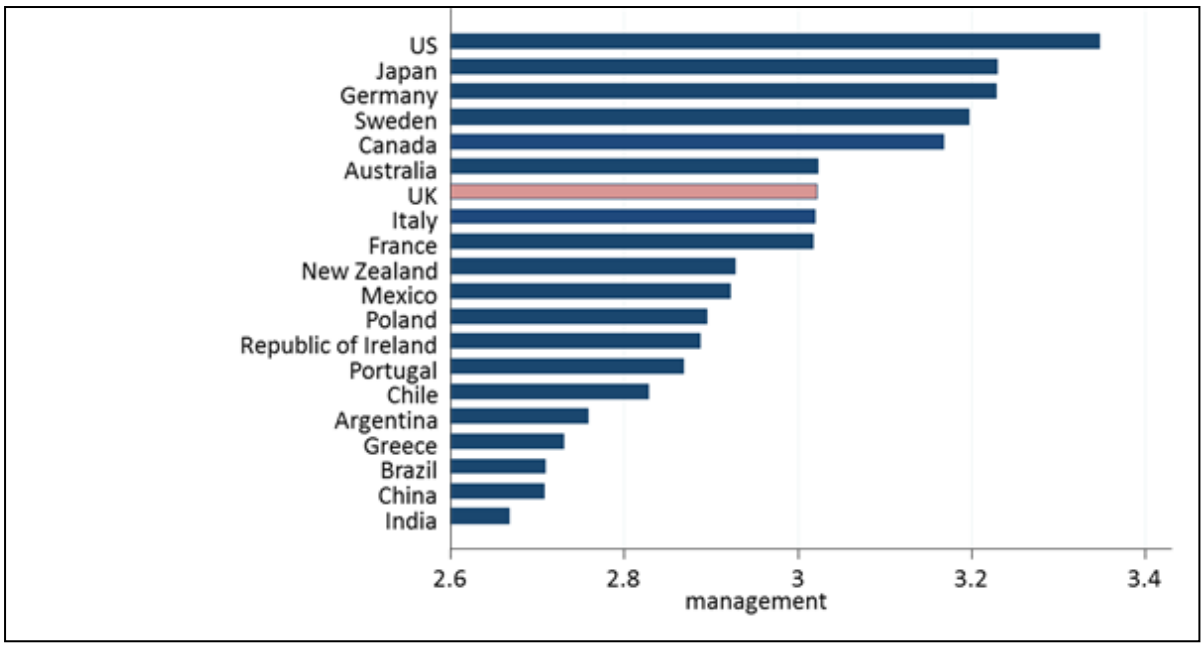
Management is believed to be an important factor in raising productivity and the UK is generally perceived to have a deficit of quality compared with some other leading nations. This perception may just be based on the popularity of British exports of TV programmes showcasing poor managers in "The Office" and Fawlty Towers", of course. It is very difficult to credibly measure management practices, but Bloom and Van Reenen (2007), (2010) have recently developed techniques to gauge some important aspects of it related to monitoring,

targets and incentives management practices. The latest version of their database covers 20 countries including the UK.

In terms of average management scores, the UK is in the middle of the pack, similar to Italy and France but significantly below the "Premier League" of nations lead by the US, but also including Japan and Germany (Figure 16). Bloom and Van Reenen (2007) show that the UK's management gap with the US is accounted for by the preponderance of family firms, lower human capital and weaker competition.

Unfortunately, the time series of their management data is too short to examine the whole of the 1997-2010 period. However, there did appear to be some catching up with the US over the 2004-2010 period on management scores (Bloom and Van Reenen, 2010).

Figure 16: Average management quality across countries



Notes: Analysis from Bloom and Van Reenen (2010). Average score across 18 questions.

Education and Skills

Public investment on education increased in the UK between 1995 and 2007, from 5% to 5.4% of GDP (see Table 4). In 2007, public expenditure on education in the UK exceeded that in the US (5.3%) and Germany (4.5%) and was just below France (5.6%).

Table 4: Public expenditure on education as a percentage of total GDP (% total public expenditure)

	1995	2000	2007
UK	5.0 (11.4)	4.3 (11.0)	5.4 (11.7)
US	4.7 (12.6)	4.9 (14.4)	5.3 (14.1)
Germany	4.6 (8.5)	4.4 (9.8)	4.5 (10.3)
France	6.3 (11)	6.0 (12.5)	5.6 (12.5)

Notes: Expenditure on educational institutions as a percentage of GDP, reproduced from IPPR (Lent and Nash, 2011) based on OECD Education at a glance data. Note that Public expenditure presented here includes subsidies to households for living costs (scholarships and grants to students/households and students loans).

Since 1997, the proportion of tertiary (or post-secondary school) educated adults rose from 23% to 33% in the UK, representing an average annual growth rate of 3.2%, which is higher than its comparators. In levels, the UK does better than Germany and France with 25% and 27% respectively in 2008; however it still lags behind the US where 41% of 25-64 year olds have a tertiary education (see Table 5).

Table 5: Percentage of 25-64 year old population by educational level

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	ave growth
UK	Below upper secondary	41	40	38	37	37	36	35	34	33	32	32	30	-2.7
	Upper secondary and post-secondary non-tertiary	37	36	37	37	37	37	37	37	37	38	37	37	0.2
	Tertiary education	23	24	25	26	26	27	28	29	30	31	32	33	3.2
US	Below upper secondary	14	14	13	13	12	13	12	12	12	12	12	11	-1.8
	Upper secondary and post-secondary non-tertiary	52	52	51	51	50	49	49	49	49	48	48	48	-0.8
	Tertiary education	34	35	36	36	37	38	38	39	39	39	40	41	1.7
Germany	Below upper secondary	17	16	19	18	17	17	17	16	17	17	16	15	-1.0
	Upper secondary and post-secondary non-tertiary	61	61	58	58	59	60	59	59	59	59	60	60	-0.1
	Tertiary education	23	23	23	23	23	23	24	25	25	24	24	25	1.0
France	Below upper secondary	41	39	38	37	36	35	35	34	33	33	31	30	-2.6
	Upper secondary and post-secondary non-tertiary	39	40	40	41	41	41	41	41	41	41	42	43	0.6
	Tertiary education	20	21	21	22	23	24	24	24	25	26	27	27	2.9

Notes: OECD Education at a glance, www.oecd.org/edu/eag2010, See Annex 3 for notes (www.oecd.org/edu/eag2010).

The UK does more poorly with upper secondary and post-secondary, non-tertiary education (which tends to represent vocational courses). Only 37% of 25-64 year olds in the UK have education of this level, compared with 43%, 48% and 60% in France, US and Germany respectively. However, this proportion has risen since 1997, with an average annual growth rate of 0.2% (compared with a decline in US and Germany but a greater rise in France).

Finally, the percentage of 25-64 year olds with below upper secondary education is 30% in the UK in 2008 (Table 5). This has fallen from 41% in 1997, at an average annual rate of 2.7%, representing a faster decline than its comparators. In 2008, the unskilled proportion of the workforce in the UK was of a similar level to France, but much higher than in Germany (15%) and the US (11%).

Therefore it appears that since 1997 progress was made, at faster rates than in comparator countries. However, given the gap at the beginning of the period, the UK is continuing to lag behind its comparators in levels - apart from in tertiary education where the UK is beaten only by the US.

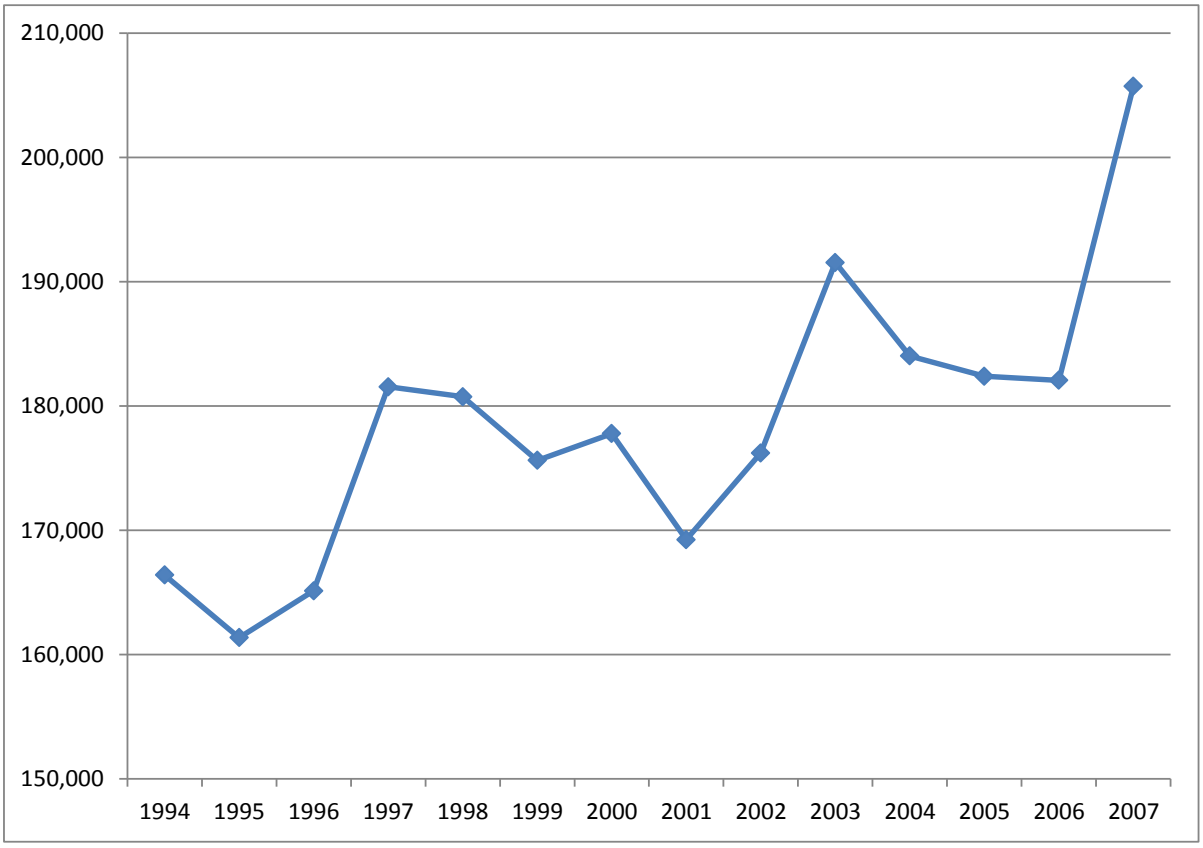
In terms of vocational skills, the UK is well-known to have problems with apprenticeships compared with some European countries like Germany, Austria and Switzerland (Steedman, 2010).

Entrepreneurship

A crude measure of entrepreneurial activity is the number of new firms being registered for VAT. Of course, many companies are registered and are actually non-trading entities, for example for tax purposes, therefore this measure is imperfect. In aggregate there has been an overall rise in registrations, from around 170,000 in 1994 to over 200,000 registrations in 2007 (see Figure 17).

Disaggregating total VAT registrations by sector, much of the aggregate rise appears to have been driven by "renting and business activities", the same sector that has made the largest contribution to productivity gains since 1997. Within this category, further investigation (not reported here) shows that the largest sectors were legal and accounting services, which grew consistently over the period and IT/data services for which registrations were also high.

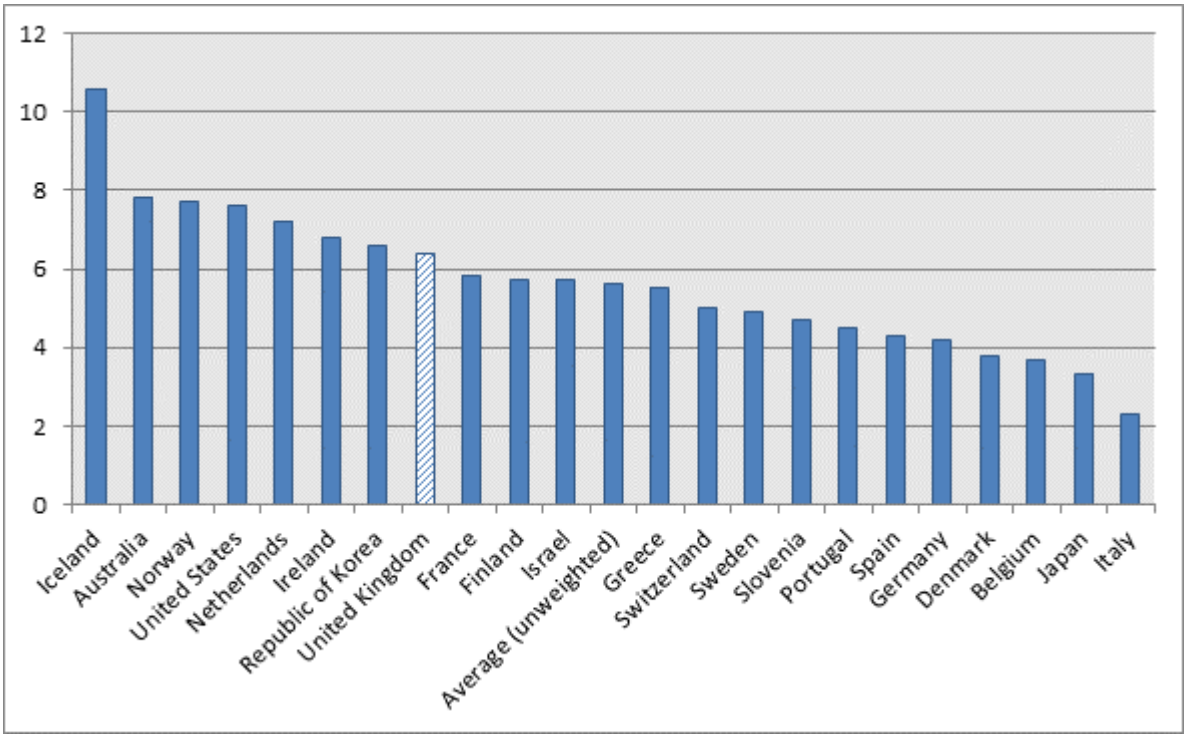
Figure 17: UK VAT registrations



Notes: BIS, http://stats.bis.gov.uk/ed/vat/index.htm

A measure based on survey data, collected by Global Entrepreneurship Monitor, is Total Early State Entrepreneurial Activity (TEA). This measures the prevalence of working age adults who are either nascent entrepreneurs (about to start up a business) or are working in a new firm (defined as the first 42 months since a business was launched). According to this data, the UK ranks above average and above Germany and France (though below the US), with just over 6% of working age adults involved in entrepreneurial activity (See Figure 18).

Figure 18: Total early stage entrepreneurial activity

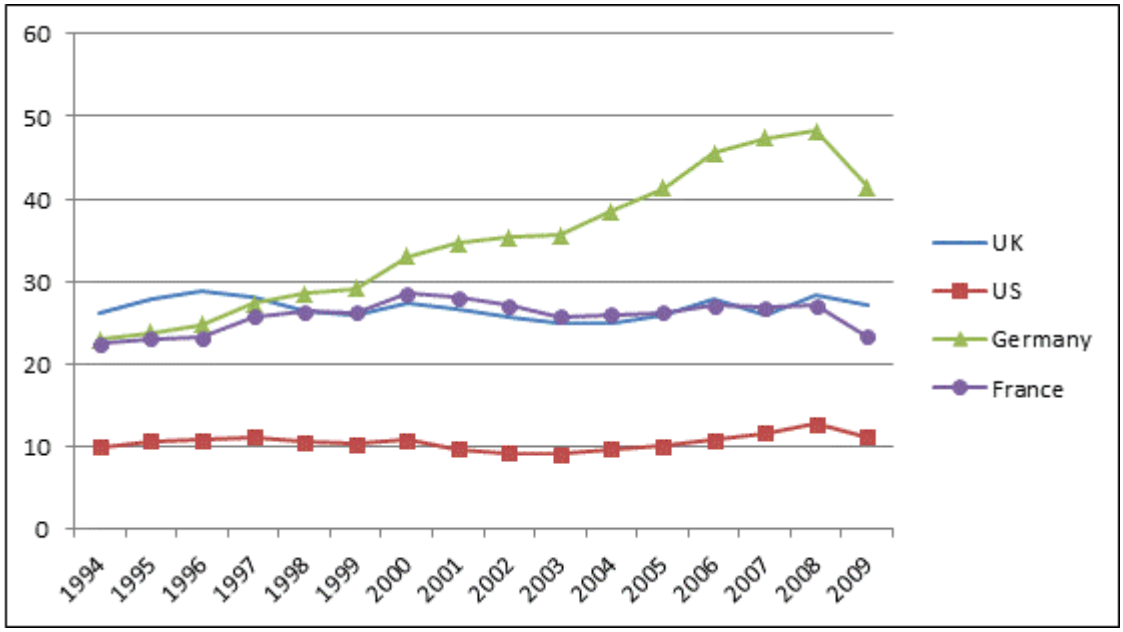


Notes: Data sourced from Global Entrepreneurship Monitor, 2010 Global Report, based on a 2009 survey. Total Early Stage Entrepreneurial Activity refers to proportion of working age population involved in starting or growing a new business (under 42 months old).

Exports

Since the early 1990s, exports as a proportion of GDP have remained around 25-28% in the UK, which has been similar to France (see Figure 19). Exports make up a lower proportion of GDP in the US, at around 10-11%. All three countries have seen relatively flat trends. However, Germany's exports have increased from around 25% to nearly 50% of GDP before the Great Recession, falling to 40% in 2009.

Figure 19: Exports of goods and services as a percentage of GDP



Notes: Data sourced from IMF data mapper, balance of payments statistics.
http://www.imf.org/external/datamapper/index.php

In terms of export mix, 41% of UK exports are related to services in 2009 (BIS, 2010b). The UK's share of the world goods export market has declined in recent years, falling from 4 % in 2000 to 3% in 2009 (BIS, 2010b). With the exception of Germany (whose share increased during the same period) other major industrial economies have experienced a similar trend, due to the rising shares of emerging economies. However, the UK has increased its share of world services exports since 1990, reaching 7% in 2009 (one of the few developed countries to do so), and has remained the second (to the US) largest exporter of services.

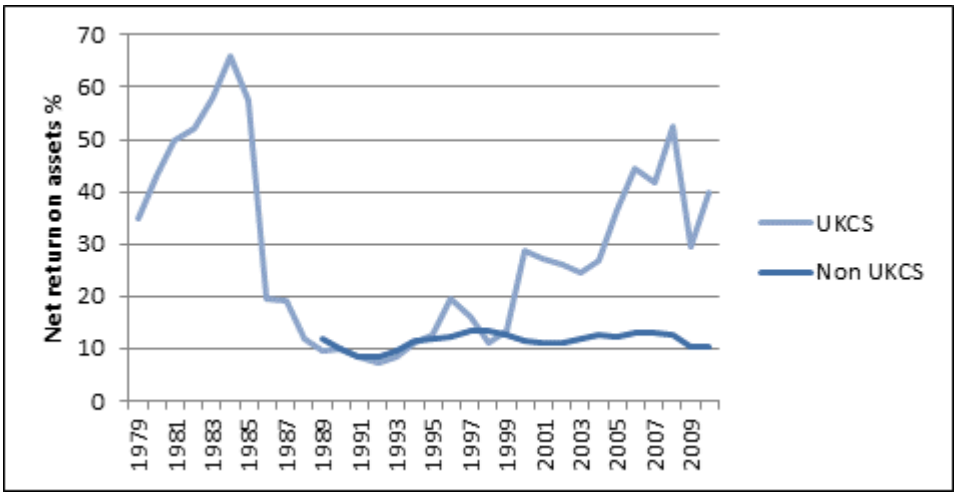
The UK's export and import performance has been rather poor after 2008 despite a huge devaluation of sterling. We discuss this in more detail in Section 4.

Profitability

While economists and policy makers measure focus on productivity, businesses themselves naturally focus on their bottom line. Profitability is rather an ambiguous indicator from a welfare point of view as it might rise for positive reasons (e.g. innovation) or negative ones (e.g. monopoly power).

Data from the ONS gives a time series of profitability measured as net operating profits over net capital employed. Figure 20 splits UK Continental Shelf (UKCS), which refers to North Sea Oil, from all other private non-financial institutions. While UKCS profitability has tended to track the oil price, Non-UKCS profits have been relatively flat at around 10-15% over the period since 1989 for which data are available. There is no evidence of any systematic decline under Labour.

Figure 20: Annual net rates of return of private non-financial corporations, UKCS and non UKCS split

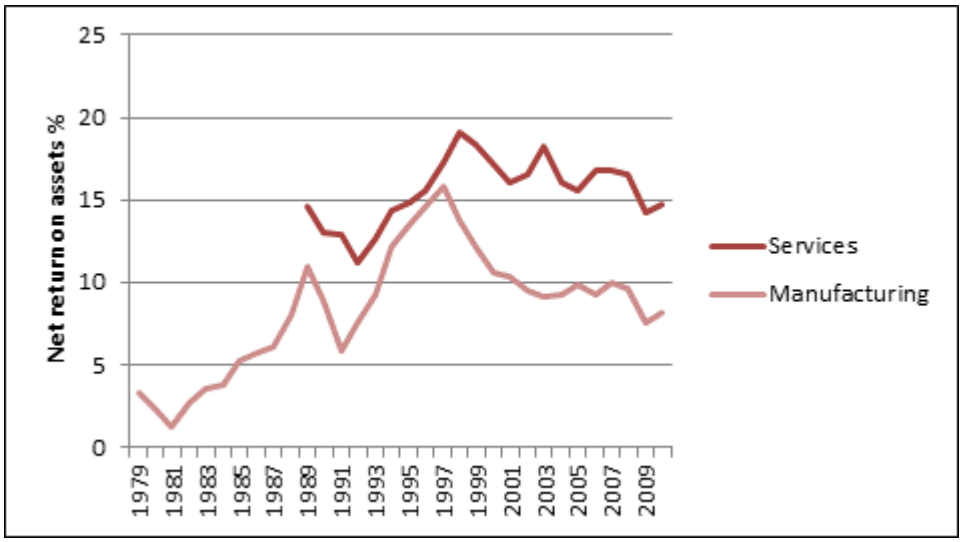


Notes: Analysis based on ONS data. UKCS refers to UK Continental Shelf, North Sea Oil production. Non UKCS consists of manufacturing, services, construction, electricity and gas, agriculture, mining, quarrying etc.

The ONS splits Non-UKCS companies between services and manufacturing, as shown in Figure 21. Here we see that profitability in both services and manufacturing appeared to peak around 1997. Interestingly, the decline in manufacturing margins post-1997 coinciding with a strong value of Sterling, and increasing competition from globalisation which puts downward pressure on margins. The margin seems to have settled around 10% from the early 2000s until the Great Recession. Services margins fluctuated at a higher level, with an average of 17% over the period 1997 to 2008, dropping off again during the recession.

Analysis of the share of profits in national income also shows considerable stability in the UK over time (Pessoa and Van Reenen, 2011).

Figure 21: Annual net rates of return of private non-financial corporations, services and manufacturing split



Notes: Analysis based on ONS data, net operating surplus divided by net average capital employed.

2.3 Regional Disparities

Regional disparities are often said to be a major problem for the UK and a cause not only of social concern but of worse overall performance. In particular it is thought that London's dominance over England (and the other three countries) "holds back" the UK. These claims need to be given some thought. Inequality can certainly be a moral concern, especially as this has grown dramatically since 1979 (Machin and Van Reenen, 2010). But it is ultimately inequality between individuals or households which is the main concern, not between areas *per se*. Since only a very small amount of the inequality between people appears to be accounted for by their region, it is hard to see why spatial inequalities should get as high a weight vis-à-vis individual and household inequality as they do (except for politicians whose constituencies are geographically based).

Since our focus in this report is on aggregate performance rather than distribution, a regional analysis would be relevant if it were the case that regional inequality was a causal influence on slower growth. But the evidence is that greater equality across places is consistent with faster and slower aggregate growth: there is no well-founded empirical or theoretical relationship. On the other hand, if growth is exclusively in one area (London and the South East), we can get situations of excess demand for labour and assets which can push up equilibrium unemployment (NAIRU). In addition, much literature on the benefits of agglomeration show that cities should be the engines of growth and the UK's failure – especially in the 1980s - to have strongly growing cities outside London cannot have helped in efforts to secure growth and productivity.

With this in mind, what are the facts?

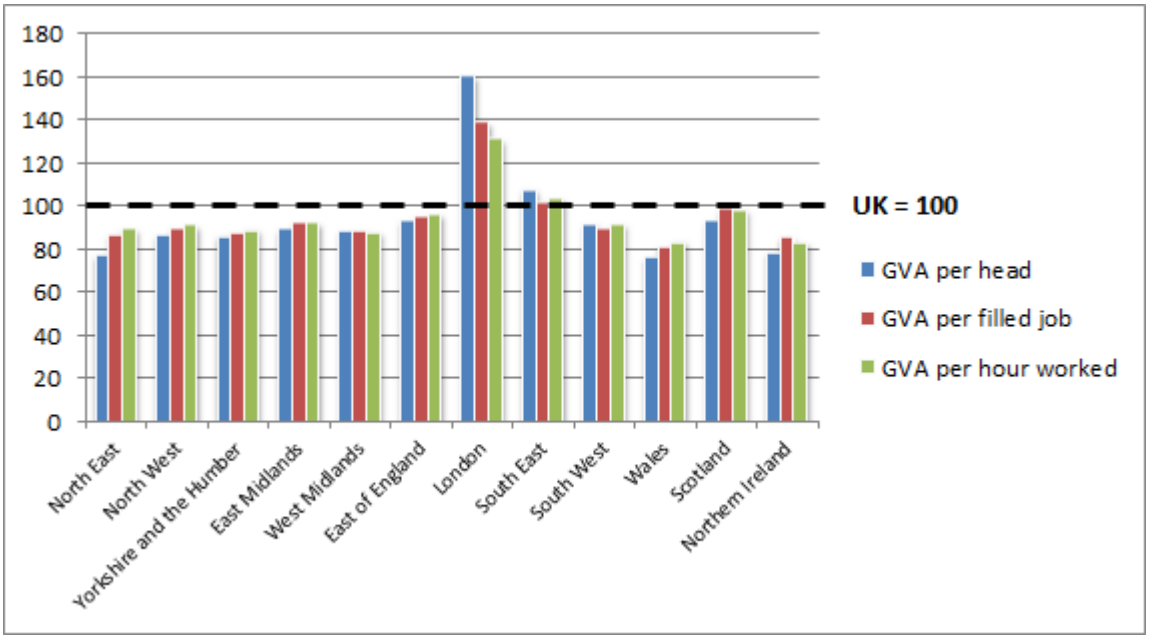
UK regions are unequal

UK regions, cities and neighbourhoods appear unequal under a number of measures: average earnings, employment, and many other socio-economic outcomes. In terms of Gross-Value-

Added per head, the top ranked 10% of UK (NUTS3 level[15]) regions have value added at least 50% higher than the bottom ranked 10% (SERC, 2011). Similarly, value added per hour in 2008 was over 50% higher in London than in Wales.

Figure 22 presents value added per head, per filled job and per hour at the level of the more aggregated (NUTS1) regions. Value added per head shows larger variation due to commuting patterns: commuters contribute to London's output which is then shared between Londoners. Therefore, productivity measures give a clearer picture. Value added per hour worked in London was at 32% above the UK average in 2009.

Figure 22: Regional economic indicators by NUTS1 region, 2009



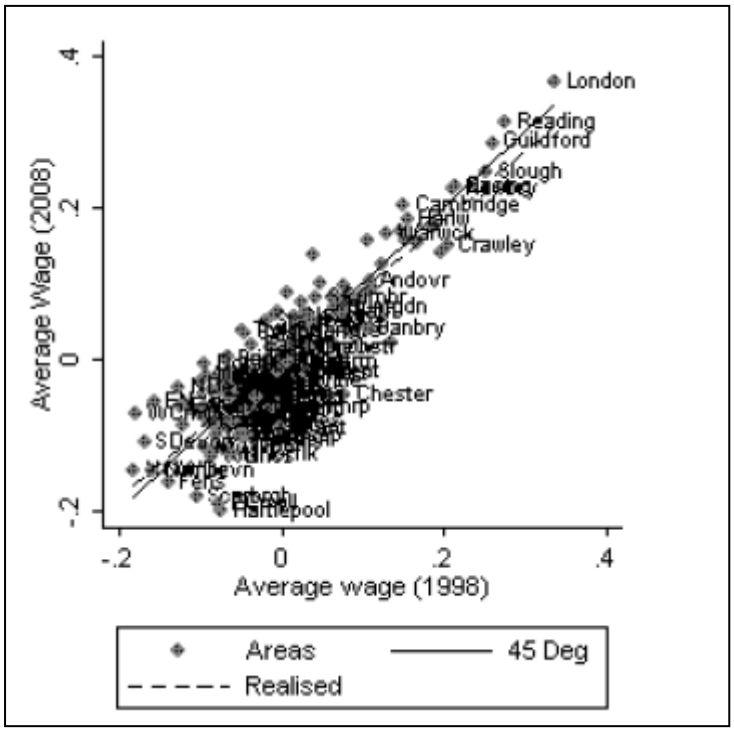
Notes: Data sourced from BIS regional economic performance indicators, based on ONS data.

Regional inequality persists over time

Regional inequality in the UK (as measured by wages or productivity) has been very stable since 1997. Overman (2010) analyses regional wages (rather than productivity) because (i) wages are linked to productivity and (ii) good individual level (micro) data on wages is available. The regions analysed are 157 "labour market areas" of which 79 are single "urban" travel to work areas and 78 are "rural areas" over the period 1998-2008. The overall level of between area wage disparities has remained roughly constant during the period. Figure 23 shows average wages in 2008 plotted against average wages in 1998. Wages are normalised by dividing by the year average.

[15] The NUTS classification is a hierarchical system for dividing up the economic territory of the EU for the purpose of regional analysis and policy. NUTS 1 are the major socio-economic regions, NUTS 2: basic regions for the application of regional policies and NUTS 3 are small regions for specific diagnoses. For further detail see http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

Figure 23: Normalised hourly wage in 1998 and 2008 across 157 areas



Notes: SERC (2010), graph plots average area wage in 1998 against average area wage in 2008 (expressed as a ratio to the UK average)

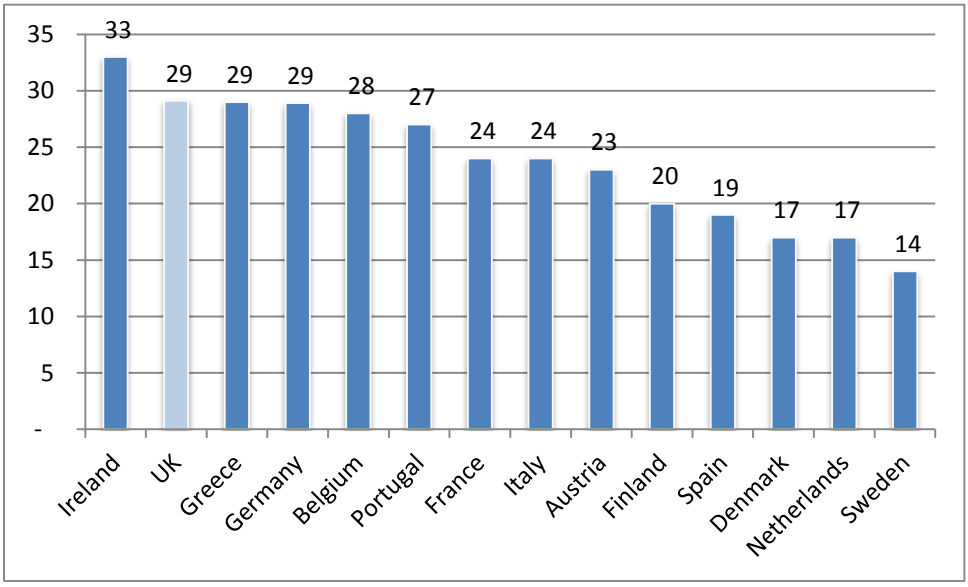
If relative average area wages were completely persistent across time the dots would sit on the 45 degree line. The dashed line (which shows the results from regressing 2008 normalised wages on 1998 normalised wages) shows this is not quite the case. On average, the lowest wages areas have caught up slightly, while the highest wages areas have fallen back although the effect is not very pronounced. Further, it appears that this 'churning' tendency amongst the rankings is not being driven by the highest wage areas which tend, if anything, to have seen their position improve (as they mainly sit above the 45 degree line).

To what extent do these disparities arise because of differences in the types of workers in different areas (sorting) versus different outcomes for the same types of workers in different areas (area effects)? Empirically, most of this wage disparity across areas is due to individual characteristics – i.e. who you are turns to be is more important than where you live.

Regional disparities in the UK are larger than other EU countries

The UK does seem to have somewhat greater inequality between regions than other countries, primarily because of the success of London. This is shown in Figure 24: compared to other EU15 countries, the UK is second only to Ireland in terms of the average regional difference from national GDP per capita.

Figure 24: Dispersion of regional GVA per capita (average regional difference from national GDP per capita (%) in 2007)



Notes: Eurostat data on EU15 minus Luxembourg

Summary on regional differences

London has higher productivity and wages than other UK regions and this regional disparity is greater than most other countries. Most spatial inequality of wages is between individuals rather than regions (or more disaggregated areas) and most of this is due to individual characteristics rather than space-based "agglomeration" effects. In other words, the higher wages in London are mainly because more productive people live and work in London rather than because London somehow makes everyone who works there more productive.

The spatial distribution has been reasonably stable despite a lot of policies to try and get other regions growing faster than London since 1997. How much of this regional dispersion is an economic or ethical problem of an "unbalanced" economy is unclear.

2.4 Summary on Indicators of Business Performance

The UK's economy shows some long-standing problems in terms of the level of business performance (e.g. in productivity, innovation and intermediate skills) but also shows some sign of improvement in recent years mirroring the productivity improvement. Skills, especially for college education have grown rapidly as has ICT investment. R&D intensity remains low, but has stopped falling and intangible investments and entrepreneurship seem impressive. Investment is lower than in Continental European countries, but FDI remains strong. Taken as a whole, these indicators certainly do not suggest that business performance and the underpinning requirements for productivity growth deteriorated under Labour since 1997, and there were clearly some movements in the right direction especially for human capital and innovation.

3. Was The UK's Strong Post 1997 Performance Anything to do With Labour's Policies?

3.1 Introduction

Our assessment so far suggests that the performance of UK business 1997-2010 was good by international standards. UK per capita GDP grew faster than all other major advanced countries and only the US had a better productivity growth record. A natural question to ask, however, is whether any of this was due to Labour policies? After all, growth may have been as fast (or even faster) under the Conservatives or Liberal Democrats.

Indeed, as noted earlier, the UK's growth of GDP per adult was about 1.4% p.a. 1997-2010 compared to 2% p.a. under the Conservatives between 1979 and 1997 (Table A.1). So although Labour did better relative to other countries on this measure it did not do better relative to the Thatcher-Major years. Similarly hourly productivity growth was 1.7% p.a. under Labour compared to 2% p.a. under the Conservatives. The picture looks better for Labour (with similar growth rates of around 2% p.a. in both periods as shown in Table A.3) if we end in 2007 prior to the Great Recession of course, as productivity has fallen dramatically during the recession as a consequence of employment falling less quickly than output.

One argument is that Labour merely reaped the dividends of structural changes that were instituted during the Conservative period – for example, more flexible labour laws, privatisation, reductions in government subsidies, some tougher enforcement of welfare payments, lower marginal tax rates, and other market-friendly policies take time to bed down. The lagged effects of these policy reforms may have boosted productivity in the late 1990s and beyond.

If this were the case Labour could still claim some credit for the glass being "half-full rather than half-empty". The good growth performance of the UK relative to other countries post 1997 could have been worse had Labour reversed many of the Conservatives' pro-growth policies. Labour did not return to 1970s style high rates of marginal taxation, re-nationalization or reinstate damaging pro-union laws, for example.

A deeper point, however, is that although many of the reforms under the Conservatives may have increased the level of productivity, it is unlikely that they led to a *permanent* increase in the rate of productivity *growth*. In order to continue to narrow the productivity gap with other countries, continuous reform is likely to be necessary, especially as many other countries were also reforming their labour and product markets. Consider union legislation, for example. There is a lively debate on whether unions reduce the level of productivity or not. Although arguments can be made on either side, it seems likely that 1970s style British unionism was a drag on productivity (Metcalf, 2003). Nevertheless, it also seems improbable that anti-union laws would have a permanent effect on productivity growth. Unions would have to have a seriously negative effect on innovation and there is no compelling evidence of this (Menezes-Filho and Van Reenen, 2003).

3.2 Analysis of Some Specific Policies

Tying aggregate productivity performance to specific policies is extremely difficult, especially as (unfortunately) British governments rarely submit their policies to rigorous evaluation and have, for various reasons, shied away from allowing randomised control trials

of business and other policies. Nevertheless, we can analyse several policies in broad scope as well as looking in detail at some specific "case studies"[16].

Competition policy

A robust finding from a host of studies suggests that increases in product market competition boost productivity (for example, Nickell (1996) and Blundell et al, (1999) on UK productivity; Bloom and Van Reenen, (2007, 2010) on management and Holmes and Schmitz, (2010), for a survey). Crafts (2011) argues that the reduction in competitive intensity in the inter-war period was a major cause of the relative decline of UK productivity which only turned around after pro-competitive reforms were implemented after 1979.

The importance of competition for improving performance were emphasised by the Treasury, Prime Minister and the Chancellor in the Labour years. Several pieces of legislation significantly strengthened competition policy. The 1998 Competition Act and the 2002 Enterprise Act both strengthened the hand of the competition authorities. In particular there was an enhanced role and greater autonomy for the Competition Commission, a de-politicisation of merger reviews and tougher punishments for cartels. Indices of product market liberalization and the quality of competition enforcement regularly place the UK as the best in the EU and sometimes the OECD.

Although demonstrating a link between competition laws and performance improvements is challenging (although see Symeonidis (2000)), it seems likely that competition policy has helped improve business performance and productivity. Since Labour introduced the most serious changes to toughen the competition policy regime this should have boosted productivity.

Human capital

Education and skills have direct effects on productivity through raising the quality of labour inputs. This has been demonstrated in hundreds of studies and is taken for granted in all growth accounting (e.g. Sianesi and Van Reenen (2003)). But education may have an effect on productivity that is even stronger than would be suggested by conventional growth accounting if there are "spillovers" – for example if having more educated people reduces crime or enables others to learn more easily. Furthermore, if human capital causes innovation as assumed by modern growth theory, then higher levels of education could have permanent effects on the growth rate. The evidence for the existence and magnitude of human capital spillovers and growth effects is mixed (e.g. Angrist and Acemoglu, (2000)) although recent evidence has been encouraging (Moretti, 2003), especially for management education (Gennaioli et al., 2011).

The university system certainly expanded under Labour. Section 2 showed that the proportion of university educated people rose much faster than in other countries from under a quarter to over a third. Similarly there have been increases in the staying on rates past the compulsory schooling age of 16. This has been aided by policies such as the Education Maintenance Allowance (EMA) which subsidised young people from low income families to stay on. High quality evaluations of this program suggest that the EMA significantly increased participation rates (Dearden et al., 2009), and passed a cost-benefit test. Since low income pupils are much more likely to drop out before 18, this benefited a part of the population that the UK schooling system has let down. Towards the end of its term Labour also brought in plans

[16] For an account of the key policies introduced and the objectives lying behind them see CORRY, D. 2011a. Labour and the Economy, 1997–2010: More than a Faustian Pact, . *In:* DIAMOND, P. & KENNY, M. (eds.) *Reassessing New Labour: Market, State and Society under Blair and Brown*

(continued by the Coalition) to raise the education leaving age to 18. Similarly, the City Academies movement, focused under Labour on the most troubled schools in the most challenging areas, appears to have improved outcomes for pupils in deprived areas (Machin and Venoit, 2011).

Although the proportions in education have improved, it is less clear-cut that quality has increased – especially relative to competitor countries. There has been a large increase in qualifications, even if there is a concern that some of this might reflect grade inflation rather than a real improvement (English PISA scores remain stubbornly low). Some elements of educational reform such as the Literacy and Numeracy Hour do appear to demonstrate positive improvements (McNally, 2010).

Research and development

The UK introduced its first R&D tax credits in 2001 (for small firms) and 2003 (for large firms). There is good international evidence that R&D is a major source of productivity growth and also that such fiscal incentives are an effective way to increase research (e.g. Hall and Van Reenen (2000); Bloom et al, (2002a)). In addition, there were substantial increases in direct grants through the science budget.

It is likely that these policies helped to stabilise the decline in R&D intensity which had been occurring in the UK since the late 1970s, in contrast to the increases in other nations. Although there have unfortunately been no direct evaluations of the UK R&D tax credit, US evidence does suggest that these fiscal incentives raise productivity and innovation (Bloom et al., 2002b). Haskel and Wallis (2010) show that there do seem to be substantial spillovers from spending on the Science Budget via research councils.

Utilities regulation: A case study of telecom regulation

The UK was a pioneer in privatising many state-owned monopolies. The first wave of this began under Mrs Thatcher after 1979 and continued in the decades thereafter. Mostly, this process has been a success in the sense that prices and quality have seen dramatic improvements (Green and Haskel, 2004). Furthermore, the financial and business service skills surrounding the privatisation and regulated sectors (e.g. utilities) has been a huge growth industry. As the privatisation model became copied overseas, these skills (e.g. consultancy) have added to Britain's export revenues.

A criticism of the privatisations was that in many cases, public sector monopolies were allowed to remain private sector monopolies who could exploit their market power. Labour was more aggressive in moving from regulation to effective competition fostering greater entry of newcomers into the business markets of the incumbents, but then allowing these incumbents more freedom to set prices and compete.

To illustrate this we look at the example of telecom regulation. In 1981 Mercury was licensed to be the first competitor for the incumbent British Telecom (BT), which was privatised in 1984. At this stage the aim was for Mercury to build its own infrastructure to compete with BT, with limited access to BT's network. RPI-X regulation was designed for BT in order to control its prices. While more competitors were allowed to enter the market, the focus remained on infrastructure competition until 1997. At this point, access to BT's network was at retail prices and cable TV operators began to build networks offering telecoms bundled together with TV channels. Competition became more service provider based after 1997 as

various measures were introduced by the regulator Oftel to enable new entrants to access BT's network. In 2000 BT was required to unbundle the local loop[17]

However, until the early 2000s, significant barriers to entry remained. A key milestone was the 2003 Communications Act, which replaced Oftel with Ofcom and established a new regulatory framework. Ofcom's Telecommunications Strategic Review called for the restructuring of BT into four business units- specifically separating the network part of the business (Openreach) so that BT would offer access to its network on equal terms to competitors as it did to its own retail and wholesale services. Following the creation of Openreach in 2006, all of BT's retail prices have been deregulated, together with some of BT's wholesale products. The access and local loop prices charged by Openreach are controlled.

Most commentators see the strengthening of competition in telecoms as a success story with lower prices, improved quality, high innovation and greater customer choice. Some of the changes were prompted by European Regulation, but Labour's decision to create Ofcom and its strategic review were important in accelerating the liberalisation of the sector. The shares of new entrants and consumer welfare rose quickly after BT's restructuring in the mid-2000s (Pollitt, 2009).

3.3 Summary on Linking Post 1997 Performance to Post 1997 Policy

Determining the causal effects of any policy is difficult, so the task of determining what part of aggregate productivity growth was explicitly due to any of Labour's policies is a Herculean task. There was a relative productivity improvement post 1997 and we deem it unlikely that all of this occurred simply as a long lagged response to the Conservative reforms in the 1980s. These would unlikely have led to permanent improvements in productivity growth.

We have pointed to several areas of policy which seemed to raise productivity – competition and regulation policy strengthened markets and human capital and innovation policies strengthened UK capacities. The nature of these policies was in many respects a continuation of past trends, deepening competition through more aggressive interventions. Their success is perhaps indicated that for the most part they have not been reversed.

4. The Great Recession and Beyond

4.1 Introduction

In this section we focus on events since the beginning of 2008 to the current day - broadly with data through the second quarter of 2011. We call this the "Great Recession" period although one could say we are formally out of the recession as growth has been (just about) positive.

The key question is whether the recession has put the economy on a lower long-term productivity growth path than pre-recession (i.e. broadly the 1979-2007 productivity growth rate)? A second question is how much of the fall in potential output is permanent and how much is transitory? The answers to these questions determine the view one takes of the path of potential output, the output gap and therefore the "room" policy makers have for stimulating the economy through fiscal and monetary means. The pessimistic view is that the UK is currently near potential output, so there is little or even no space for demand to

[17] This enabled other operators to use the connection between customers' premises and the local exchange to offer fixed telephony and broadband services.

increase real output without igniting further inflation. In other words, the "economic speed limit" has been lowered. A more optimistic reading would suggest a larger output gap and therefore a greater role for demand stimulus; or equivalently, less of a need for fiscal austerity.

While a full analysis of the recession is outside the scope of this paper, we consider whether the structure of the economy which emerged under Labour caused the UK to enter the recession in a particularly vulnerable position, implying that our current output gap is small and future growth will be slower than that of the pre-crisis years. To address this we first ask why we focus on the Great Recession (sub-section 0) and what it reveals about Labour's record (sub-section 0). Then we look at the productivity record (sub-section 0), which leads us into the debate around the output gap (sub-section 0). We discuss the reasons why the financial crisis and other factors may have dampened productivity permanently (sub-sections 0 and 0) and critically review the evidence on this in (sub-section 0).

4.2 Why Look at the Great Recession?

To most readers, it would seem obvious to focus on the last few years because this is the obsession in policy and media circles. But from an academic perspective this period is by far and away the hardest to analyse because recent data, especially on output, is subject to large revisions. This is especially so during times of huge changes when GDP has fallen by more than at any time since the Great Depression and this makes judgements open to an unusually high degree of uncertainty. Industry-level data is not available at the level of detail that we used in Section 1. Looking at even broad industries from an international perspective is impossible as the data has not yet been constructed in a comparable way (although it will be in time).

Despite these difficulties it is important to do some analysis. First, because of the widespread view that the economic problems of recent years reveal that the good 1997-2007 performance was an illusion. Second, because many commentators have taken strong views on what UK performance is likely to be going forward that we believe are based on false certainties. Finally, policy has to be based on our best guess of where we are, so we seek to inform this debate to the best of our ability, at least in order to clarify the differences in the arguments.

4.3 What Does the Great Recession Reveal About Labour's Policies?

There are a number of stories that try to link the problems of the UK economy now to what happened in the Labour period. These tend to get mixed up and it is important to distinguish and analyse them separately.

Were the 1997-2007 productivity improvements a statistical illusion?

In pride of place is the argument that the productivity improvements from 1997-2007 were mainly froth, driven by a finance and real estate bubble. Thus when the crash happened the mask was removed and the UK was revealed to have a much lower trend rate of growth and productivity than had been previously maintained. Potential output was lower than we had thought and so despite a massive fall-off in output now compared to what it would have been if trend had been maintained, the UK has virtually no gap between potential and actual output. Our work in the previous chapters suggests this argument does not really stack up. As we have seen, the financial sector only contributed about 0.4% of the 2.8% annual growth in the UK market economy, which excludes the public sector and real estate, both of which held back aggregate productivity. We also saw that productivity increases were mainly based in business services and distribution and generated through the increased importance of human

capital and ICT (compared to low-tech capital). It is difficult to see why such activities could be solely generated by an artificial financial or property bubble.

Was the Great Recession due to Labour's policies?

The second argument is that the crash itself was the result of Labour policies. One reason for this is the weak regulation of the financial sector which clearly had a role to play in causing the financial crisis. This "light touch" regulation was supported by the previous government, and was a global phenomenon with the catalyst being in the US and not the UK. So although the global financial liberalisation in the 1990s and 2000s was generally supported by Labour, it is likely that broadly the same policies would have been pursued by the Conservatives. It is hard to blame the global crash on the UK policies.

Did Labour do the wrong things after the crash occurred?

The third argument is that the wrong things were done once the crash occurred. However, as our work shows, the record even through to 2010 was not that bad. If anything the vigorous counter-cyclical and interventionist actions that were taken, and which had real and confidence effects from 2008, meant that output and employment did not fall nearly as much as it could have. Recapitalising banks and maintaining demand through fiscal policies were common throughout the OECD and indicated that policy lessons had been learned from the Great Depression.

Productivity fell, but primarily because employment stayed much higher than would be expected compared to previous recessions (Gregg and Wadsworth, 2011). Real wages have fallen substantially since the Great Recession, and this has been an important factor in keeping unemployment much lower than we would expect. Additionally, the effectiveness of the Employment Service is greater than in previous recessions.

Did Labour's policies leave the UK more vulnerable to the effects of the downturn than other countries?

The strongest challenge is that the UK economy was particularly vulnerable to a downturn because of policy mistakes made by Labour. The primary mistakes are to do with financial regulation and public debt.

Financial market regulation

Financial market regulation clearly failed. The UK had pioneered the "light touch" rule of reason approach to guiding financial markets – before Labour came into power – and an approach that the new Financial Services Authority[18] pursued. The direction of travel was similar to many other countries such as the US, but the UK was clearly a supporter or even a leader in some areas. Other nations such as Canada, were more prudent and this is one reason why they have weathered the financial storm much better.

The light touch regulation helped the development of the financial services industry and there have been benefits of this in terms of access to credit. But it was clear this went too far (although nowhere nearly as bad as in the US sub-prime fiasco). The wholesale end of the finance sector concentrated in the City of London is the strongest cluster in the UK and created huge amounts of tax revenue and high paying jobs. It also drew a lot of talented people in the UK towards this sector and out of other industries that would be more

[18] The Financial Services Authority (FSA) is the UK financial regulator, an independent non-governmental body which was given statutory powers by the Financial Services and Markets Act 2000.

favourable to long-term growth. Because the UK has a larger financial sector than other countries it took a harder hit in the downturn. On the positive side, however, if there is a reallocation of British talent away from finance towards sectors that are creating more real and durable output, this could in the long-term be a boost to national income.

Section 5 discusses some of the policy choices around finance going forward. In retrospect, a major problem was "too big to fail" – equity and bondholders of financial institutions were given too many implicit and explicit guarantees of protection if they got into trouble. This encouraged banks to take excessive risks and disguise these risks by creating exotic and opaque financial instruments. By being protected on the downside for the risks, but being handsomely rewarded on the upside, this created a form of structural moral hazard so that all agents from shareholders, to CEOs to traders were incentivised to take these risks. When the crisis hit, the state had little choice but to bailout the failing institutions. But during the good times, and with hindsight, it is clear that regulatory policy should have been more vigilant in all countries in (a) creating a mechanism for the orderly break-up of failing banks (such as so-called "living wills"); (b) demanding higher capital requirement to prevent the excessive leveraging of debt (a la Basel 3); (c) keeping a greater separation between the "casino" (investment) and "utility" (retail) part of banking; (d) controlling the exposure of utility banking to raising finance in the wholesale market (Northern Rock's problem) and (e) paying more attention to asset bubbles (such as in housing).

There is a huge debate over the causes of the financial crisis and we do not have space to go through all the arguments here (for an excellent discussion of these issues see *inter alia* Reinhart and Rogoff (2009); LSE Future of Finance (Turner et al., 2010); Rajan (2010); Squam Lake Report (Turner et al., 2010)). Labour's policies towards the financial sector were remiss and a better approach to the financial sector would have reduced some of the costs in lost output. On the other hand, it is likely that Conservative policies would have been broadly similar. The failure of financial market regulation was really a global problem, whose consequences we will be living with for a long time to come.

Public debt

Financial deregulation also meant that consumers were able to borrow money easily and build up very large debts. In the light of the current Eurozone sovereign debt crisis, however, the greater concern has been with the level of public debt.

In retrospect, it is clear that public debt levels were too high for the stage of the cycle in 2008 in the UK (alongside many other countries like the US, Ireland and Spain). This reflected the large increase in public spending after 2000 with what we now can see were insufficient increases in tax to fully pay for this, which meant that the budget deficits were running up debt. The debt position has exacerbated the pain of recession. However, the "structural" element of the deficit, excluding investment spending, that was not related to cycle was only about 1% of GDP in 2008 (Portes, 2011). Over the next two years this jumped to 5% because of the crisis – the poor state of the public finances was a consequence of the recession, not a cause of it.

Having said this, a sense of perspective is required the UK debt and deficit position is not catastrophic in an historical context. In 2010 national debt stood at 52% of GDP, high in comparison to the 1980s and 1990s (see OECD Economic Outlook Database, 2010)., but lower than much of the 20th Century (between 1750 and 1850 debt exceeded 100% of GDP). Compared to other countries the maturity of UK sovereign debt is very long which means that the Chancellor does not have to raise finance frequently (like Italy). The UK is not Greece. According to Reinhart and Rogoff (2009) (see data in Table 10.2) between 1800 and

2008 Greece was in default or rescheduling public debt 50.6% of the time and the figure for Spain was 23.7%. Britain, by contrast was in such a state zero per cent of the time.

As discussed below, Labour left office with a plan to eliminate the structural deficit in eight years. In July 2010, the Coalition replaced this with a plan to eliminate the structural deficit in four years. Thus there is and was a cross-party consensus over the medium term plan to reduce the deficit: the question is more to do with its pace and timing – perhaps a second order issue but a crucial one nevertheless.

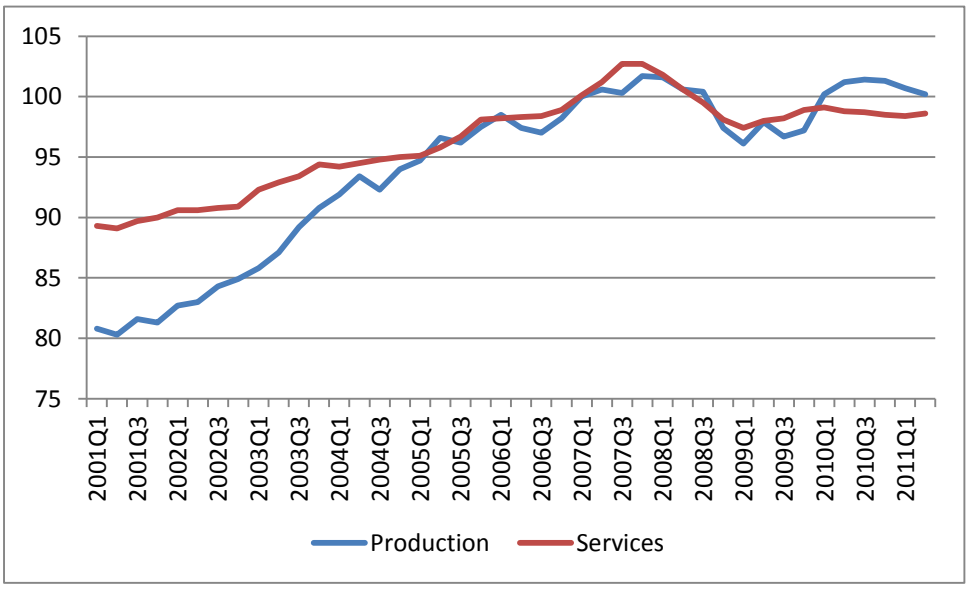
Summary

The Great Recession does not overturn our assessment of real productivity improvements pre-2007 and certainly does not show that Labour was to blame for the recession. However, the failure to properly regulate finance and the failure to bring the deficit down by more during the good times were, in retrospective, clearly policy mistakes which left the country vulnerable to the downturn.

4.4 UK Productivity Performance in the Great Recession

We have seen, in sub-section 0 that productivity has suffered substantially since 2008, the onset of the Great Recession. As previously discussed, EU KLEMS data is not available beyond 2007, and therefore it is not possible to carry out the cross-country sectoral productivity analysis on the same basis. We therefore consider recent ONS data for the UK only in Figure 25 (GDP per job looks similar). While service sector productivity appears to have been more flat during the recession, GDP per hour in the production sectors saw a sharper dip on 2009, followed by some recovery and then decline since 2010. Understanding this shortfall in productivity is at the heart of the debate over the output gap: the difference between current level of output and the *potential* level of output.

Figure 25: Output per hour worked, seasonally adjusted, Index=100 in 2008



Notes: Analysis based on ONS Labour Productivity Statistical Bulletin, Q2 2011. Production consists of mining & quarrying, manufacturing and electricity, gas and water. The services sector comprises of distribution, hotels & restaurants, transport storage and communication and business services & finance.

4.5 The Output Gap and its Estimation

What is the output gap?

The output gap is defined as the difference between potential output and actual output. Potential output is not observed and must be estimated. It can be thought of as the amount of output consistent with stable inflation. Formally, potential output is defined as the highest possible level of output that can be achieved by the potential labour force (assuming some natural rate of unemployment) and the capital stock that can be employed, without inflationary pressures, and given the state of technology (Van Ark, 2010). It is important because an economy where the output gap is zero cannot stimulate demand without causing an inflationary spiral.

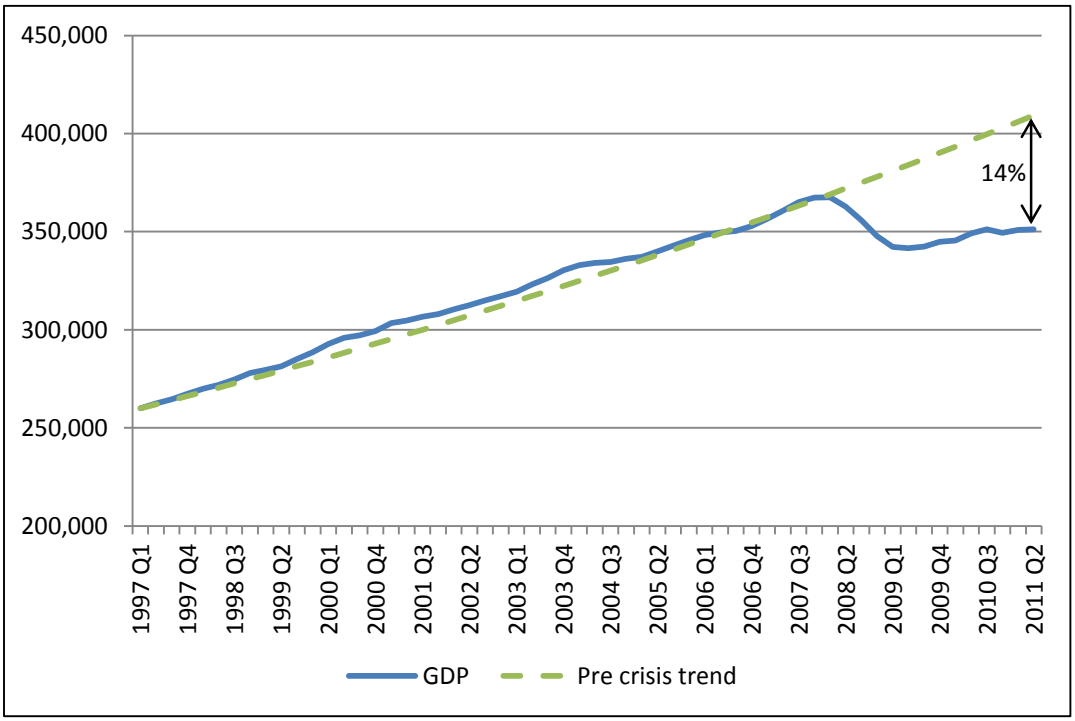
The output gap is a crude concept, easy to think of in the manufacturing economy as "spare capacity" but increasingly irrelevant in a service driven economy as many service sectors activity can be scaled up very quickly should demand appear. Physical capital is much less important that human capital and business capabilities in the service sector and, as noted in Section 2, such forms of intangible capital are exceptionally hard to measure. Furthermore, potential output is also affected by demand. The degree of long term unemployment depresses potential output and the ability to expand, as long-term unemployed lose skills and motivation and cease to put downward pressure on wages. Long periods of deficient demand will build up structural unemployment and so cause "hysteresis" increasing the output gap.

Figure 26 shows the latest available GDP figures from the ONS[19], which increased its estimates of the pre-crisis trend growth rate up to 3.2% (based on GDP at market prices), and revised its view of the recession as being deeper than previously thought. The result is that output in Q2 2011 was around 14% lower than we may have expected without the crisis[20]. The dashed line in Figure 26 extrapolates the 1997Q1 to 2007Q4 average growth rates through to 2011Q2.

[19] The 2011Q3 figures released in early November from ONS are preliminary and do not have a fully restated time series in the same format as the Q2 quarterly bulletin.

[20] This is higher than the 11% based on Bank of England's May forecasts, GILES, C. 2011a. The 14 per cent question. *Financial Times*.

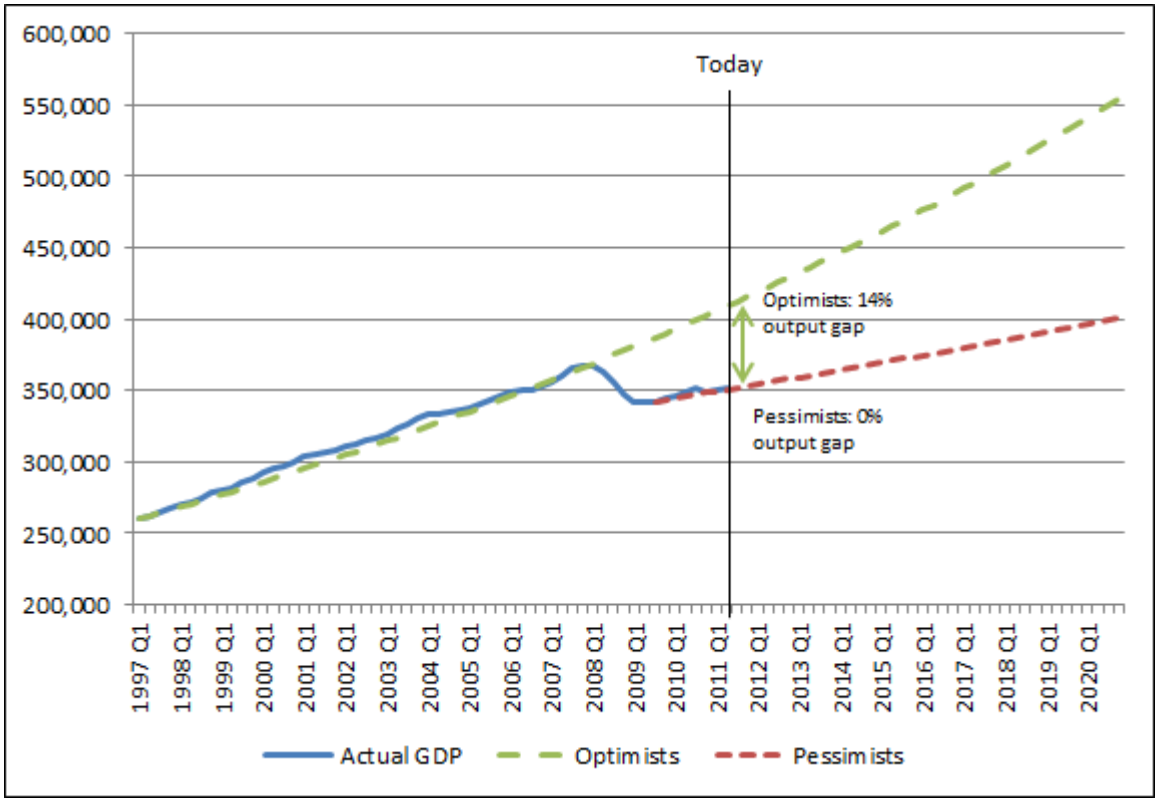
Figure 26: GDP at market prices (£ million)



Notes: Analysis based on ONS Q2 2011 Quarterly National Accounts, downloaded 25th October 2011, which runs through to Q2 2011. GDP in £ million, in real terms at market prices (chained volume measure (reference year 2008), seasonally adjusted, together with a trend line calculated based on the average annual growth rate between 1997 and the end of 2007.

In stylised form, Figure 27 shows the nature of the different positions taken on the output gap which are more or less bounded between what we call the "extreme" optimists and pessimists. An extreme optimist would believe that the economy could continue to grow at a similar rate as prior to the recession *and* that there has not been a permanent reduction in the level of output so the output gap is very large. This is the upper dashed line in Figure 27. Pessimists believe that not only has the economy taken a permanent hit to the level of output it is now on a lower growth path (this is the lower dashed line in Figure 27). The current level of output is on or close to potential output in the supply side pessimists' view.

Figure 27: Extreme optimists and pessimists' views potential output and the output gap

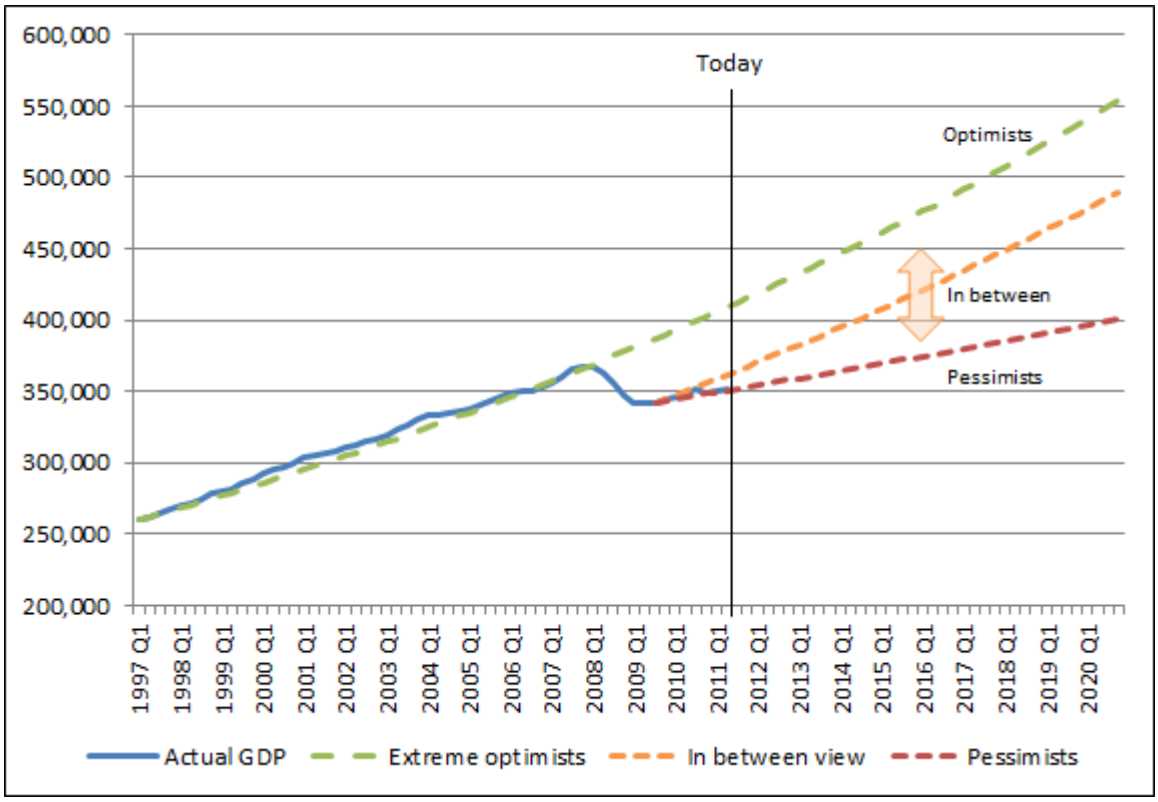


Notes: Analysis based on ONS Q2 2011 Quarterly National Accounts, downloaded 25th October 2011, which runs through to Q2 2011. GDP in £ million in real terms at market prices, (chained volume measure, reference year 2008), seasonally adjusted. Stylised optimists' view of potential output corresponds to the trend line based on the average annual growth rate between 1997 and the end of 2007. Stylised extreme pessimists' view of potential output corresponds to a trend line based on the average quarterly growth rate between Q2 2009 and Q2 2011.

Most other views lie in between these two extremes (Figure 28)[21]. For instance one might have a belief that after a permanent drop-off in the level of output, the economy could have grown at its old prior rate (this is labelled an "In-between" view in (Figure 28). One could also believe that there has been some permanent fall in output (smaller than the fall shown in Figure 26), combined with a slightly lower trend growth rate. Policy choices during the recession itself are highly likely to have also lowered the sustainable rate.

[21] Although of course there are ultra-pessimists who believe things may get even worse with a collapse of the Eurozone, further slowdown of the US and China, etc. Their projections would be even further south of the dotted line.

Figure 28: Most views of potential output, and hence the output gap lie somewhere in between



Notes: Analysis based on ONS Q2 2011 Quarterly National Accounts, downloaded 25th October 2011, which runs through to Q2 2011. GDP in £ million, in real terms at market prices (chained volume measure (reference year 2008), seasonally adjusted. Stylised in between view allows for a loss in productive potential following the crisis (the amount may vary), but the economy can return to pre-crisis trends.

In general we would not expect the output gap to be merely the difference between current output and a simple extrapolation of a pre-crisis trend, particularly where major structural changes have occurred in the economy as a result of the crisis some of them a factor of demand itself. Thus the extreme optimist position is unlikely to be correct. Such changes may reduce the economy's productive potential, for example via the scrapping of human and fixed capital, reduced innovation and lower workforce participation. On the other hand, bad times may be a period where lower productivity firms go under and when firms invest in technological and organizational innovation building up potential productive capacity when the upturn comes; indeed after a 'typical' recession we often see steep recoveries and high growth rates. Given all these uncertainties therefore, the output gap is typically estimated using some model as discussed in the next sub-section.

The concept of the output gap is central to the Office for Budget Responsibility's (OBR) economic and fiscal forecasts, and its assessment of whether the Government is on track in meetings its deficit reduction targets. As the output gap determines the extent that the economy can grow in a sustainable fashion, it tells us how much of the current deficit can be reduced as the economy recovers as opposed to needing to be dealt with through further austerity.

Estimating the output gap

The key issue in measuring the output gap is that potential output is unobservable, and must be estimated. A number of approaches may be used in order to estimate potential output, each with its own advantages and limitations[22]:

- *Statistical filters*: Statistical filters such as the Hodrick-Prescott filter can be used to extract a smoothed trend from an output series, approximating the path of potential output. Such methods have the advantage that they are transparent and easy to replicate, but they lack economic foundations and suffer from end point issues, particularly in the presence of a structural break (like the financial crisis)[23]. A lot will depend on over what period the smoothing is taken. As Figure 27 shows using 1997-2007 would look like the optimists whereas using 2007-2011 would give something very pessimistic.

- *Production function approach*: Estimates of potential output are derived from assumptions on the potential level of capital and labour, and TFP. This is the approach favoured by most of the institutions that publish output gap estimates[24]. The production approach has the advantage that it is based on a solid economic model, and the contributions of different factors to potential growth can be assessed. However, a number of judgements and measurement issues are involved in the estimation, these methods often involve statistical filters for obtaining their inputs, and this method is highly sensitive to revisions in national accounts. The key element in the production function will be the estimation of TFP growth: if this is deemed to be the same as the 1979-2007 trends (about 1% pa in the market sector) then this will generate reasonably optimistic outcomes.

- *Cyclical Indicators:* A wide range of indicators (including business surveys and other national statistics) are used to inform the estimate of the output gap. These indicators must be combined and weighted to produce an aggregate output gap estimate. This is the approach used by the Office of Budget Responsibility (OBR), and two different methods are used for combining the information in the cyclical indicators (OBR, 2011a): the "aggregate composites method" and "principal components analysis". The series obtained from these alternative methods are standardised and then scaled to the historical OECD output gap series (using its mean and standard deviation). Since this is based on a production function approach the cyclical indicator method "piggy backs" off this other method, and therefore shares many of the same problems. It does have the advantage of using a wide range of indicators relevant for assessing the output gap, and is less sensitive to national accounts revisions. However, there are still huge measurement error issues, particularly in survey data (e.g. Bank of England Inflation Report (BoE, August 2011) for discussion). It is extremely unclear that "recruitment difficulties" means the same thing over time, especially after a massive fall in output

[22] For a good high level evaluation of statistical filter versus production function approaches, see COTIS, J.-P., ELMESKOV, J. & MOUROUGANE, A. 2005. Estimates of potential output: Benefits and pitfalls from a policy perspective. *In:* REICHLIN, L. (ed.) *The Euro Area Business Cycle: Stylised Facts and Measurement Issues.* London: CEPR. Appendix **4** gives more detail on the methodologies used by OBR, OECD, IMF, NIESR and the EC.

[23] We note that rather than standing on their own, such methods are often used within a production function framework (for series such as NAIRU, TFP or participation rates).

[24] See the OECD, European Commission (EC), NIESR, and until recently, IMF.

and jobs. In addition this method is highly sensitive to the variance in the OECD historical forecasts.

- *Semi-structural approaches*: These are mixed methods, relying on both structural econometric foundations and recent econometric techniques, such as unobservable components models[25]. The IMF has recently adopted this type of approach in its "Global Projection Model" (IMF, 2010), conditioning potential output on three variables (in addition to output itself): unemployment, capacity utilisation and inflation. In general, unobserved components models have the advantage of being based on economic foundations, however estimates tend to be very sensitive to econometric specification (e.g. EC Economic Policy Committee (2001)) and are subject to large margins of error (Orphanides and van Norden, 2002).

Despite their apparent sophistication, these methods are little more than educated guesses, especially when the economy has been experiencing a major recession. There exists enormous uncertainty over the output gap level. Table 6 summarises the most recent published estimates of the UK output gap, together with the methodology used. While the OBR currently uses a cyclical indicators approach to produce its own estimates, it compares these with the estimates of other leading forecasters, and performs sensitivity analysis on central estimates[26].

Table 6: Recent published estimates of the UK output gap, expressed as a percentage of potential GDP

Source	Methodology	Output gap	Year	Trend GDP growth rate assumed
MPC, Adam Posen, 2010	Not specified	3-over 4%	2010	suggests that it is largely unchanged
MPC, Martin Weale, Nov 2010	Not specified	4-6.5%	2010	"trend growth has probably fallen a little"
European Commission, Autumn Forecast, 2010	Production function	just over 5%	2010	n/a
IMF, World Economic Outlook, October, 2010	Semi-structural approach	2.6%	2010	n/a
NIESR, January Economic Review, January 2011	Production function	4% or more	2010	"not much greater than 2%"
OECD, Economic Survey of the United Kingdom, March 2011	Production function	4.6%	2010	n/a
OBR, Economic and Fiscal Outlook, March 2011	Cyclical indicators	3%	2010	2.35% to end 2013, 2.10% after
IMF, World Economic Outlook, October, 2011	Semi-structural approach	2.9%	2011	n/a
Chris Giles, FT, September 2011	Cyclical indicators	2.6%	2011	n/a

Notes: Extension of the summary provided in the OBR Economic and Fiscal Outlook, Office of Budget Responsibility, March 2011 (OBR, 2011b). Output gap expressed as a percentage of potential GDP. MPC references are speeches given by Posen (2010) and Weale (2010).

[25] Statistical filter methods are nested within the group of unobserved components models (Orphanides and van Norden, 2002).
[26] The OBR may soon change its methodology, GILES, C. 2011e. Spare capacity doubt clouds growth picture. *Financial Times*.

At the time of writing (November 2011) the most recent published estimates have been made by the FT (Giles, 2011f), using the OBR methodology but updating it for the three additional quarters of data which are now available (the March OBR estimates used data up to 2010 Q3). The estimate of spare capacity using the "aggregate composite" approach is 1.7% (down from the 3.9% it expected in the second quarter of 2011). On the second measure ("principal components"), the estimate of spare capacity is higher at 3.5%. When the OBR's standard practice of averaging the results from the two techniques is used, the estimate of spare capacity is 2.6%.

Overall, the consensus is that some spare capacity still exists in the economy, but the extent of this seems to range from 1.7% to over 6.5%. Given that there are also standard errors around these, such estimates would seem a poor guide to policy decision-making.

More recent estimates of output gap appear to be getting smaller. This could be due to (i) revisions in the data; (ii) because the damage done by the recession was deeper than originally thought; (iii) much of the capacity before the recession was illusory; (iv) human and physical capital scrapping (i.e. loss of skills due to unemployment and less job related training – see Weale (2010) and Barrell and Kirby (2011)); or (v) lower investment. If (iv) and (v) are a response to insufficient demand then potential output will fall. It is not clear how low the output gap has to be to make demand expansion too risky. It is often implied that we are already there but in fact even the lowest estimates are still quite large. There is also a general lesson. Even if the real output gap was large (say 6% or more), if policy makers mistakenly believe it is small and keep demand low this will reduce potential output and make the output gap small. Thus pessimism becomes a self-fulfilling prophecy.

4.6 Supply Side Pessimism: the Financial Sector

Why are banking crises so bad for output?

A commonly held view is that lower productivity is due to a permanent and structural loss in productive capacity, and the economy will not return to pre-crisis trends (OBR, 2011b), (Giles, 2011d). In this case, the output gap is very small, and we will not return to the types of growth rates witnessed pre-crisis, but stay on a lower growth trajectory.

The challenge for the pessimists is to explain why underlying productivity growth suffered so much and so quickly. One potential explanation that has been put forward is the contraction of banking (Giles, 2011d, HMT, 2010, OBR, 2010, Weale, 2009). Banking could damage productivity in at least two ways. Firstly, there is a mechanical reallocation effect whereby since banking is a high (measured) productivity sector, the shift of workers out of banking jobs and into lower productivity sectors will have a permanent negative impact on aggregate productivity. Giles (2011d) in fact accounts for 74% of the fall in the output with this effect. The calculations below, however, suggest that this is an over-estimate.

A second way the financial sector may have more general effects on productivity are more indirect including:

- Loss of productivity due to a less efficient allocation of capital (BoE, November 2009, Haugh et al., 2009, OBR, 2010).
- Reduction in business investment in response to increase cost of finance, due to market risk aversion and banks' capital needs (Barrell, 2011, Barrell and Kirby, 2011, BoE, February 2011, OBR, 2010).
- Fewer new company formations and increased capital scrapping or liquidation of companies during the recession (BoE, February, May, August 2011)

- Diversion of managerial time to deal with financial relationships rather than productivity improvements (Dale, 2011,)
- Small firms are disproportionately hurt and these small firms are disproportionately innovative (Dale, 2011)[27]

Recessions caused by banking crises are believed to be more severe than general recessions for these reasons. There is some evidence that this is the case from macro-econometric analyses (Cerra and Sexana, (2008); Furceri and Mourougane (2009), IMF (Cerra et al., 2009)). For example, Reinhart and Rogoff (2009) compile data from 800 years across many countries to show the damage done by financial booms and subsequent busts. But as they concede (p.165) "It is beyond the scope of this book to ascertain the longer-run growth consequences of banking crises."

One might wonder how convincing these arguments are, what scale of impact they could have and how long lasting they will be. For example, if we thought that the boom in finance in the 2000s led to severe distortions in the allocation of capital (financial and human) an unwinding of these positions could in the longer term increase output as resources are released to more productive uses.

A dramatic example is the Great Depression who proximate cause was a banking crisis. In the US GNP levels appeared to fall by about 17-19%: the peak-to-trough decline in GNP was 27% so that real output did not return to its 1929 level until 1939. However, the long-run *growth rate* was largely unchanged (Perron (1989), Ben-David et al. (2003)). Further, during the Great Depression, policy makers made many mistakes including attempting to balance the budget and running high interest rates. These were compounded by policies that reduced competition in product markets through tariffs and government sponsored cartels. The hope is that in this respect at least "this time it's different" as states responded aggressively to shore up the banking system, and stimulate the economy with expansionary fiscal and monetary policy. Thus, it is not inevitable that we repeat the errors of the inter-war period and suffer such a large loss in permanent output.

So far it has been hard to explain all the loss in productivity through these arguments alone (Dale, 2011, Martin, 2011). We examine this evidence in detail next.

Evidence on the direct role of banking to lower growth in the recession

We first focus on the direct role of banking which is easier to assess. We have already seen in sub-section 0 that productivity growth in the period preceding the crisis was *not* predominantly explained by finance. What about during the crisis?

Using unpublished industry-level ONS data, analysis by Martin (2011) rejects the view that the contraction of banking alone can explain the productivity shortfall. Table 7 reproduces some of this analysis, showing the sectoral average annual growth rates in productivity, measured in terms of gross value added (GVA) per job for the pre-crisis period (2001 to 2007) and the period since then (Q1 2008 to Q4 2010), together with an output gap measured as the difference between actual output and what it would have been had it followed the pre-crisis trend. It is clear that average productivity growth fell substantially in finance, by 5.1 percentage points. But large falls were witnessed in most other sectors too, particularly agriculture, mining and utilities (which includes oil). Slightly smaller falls were seen in

[27] This is a highly contested claim. R&D and patents are concentrated in larger firms. Smaller firms tend to be less productive, worse managed and pay lower wages. Contrary to popular belief, smaller firms do not create on net more jobs than larger firms - but newer firms do. See HALTIWANGER, J. C., JARMIN, R. S. & MIRANDA, J. 2011. Who Creates Jobs? Small vs. Large vs. Young. *NBER Working Paper*.

sectors that make up a larger share of the economy (and therefore make a larger contribution to the aggregate fall in productivity), including manufacturing, distribution and transport. In fact a smaller deceleration was seen in business services which is the largest of the market economy sectors (at 24%, the same as "government and other services").

Table 7: Productivity growth by sector, 2001-2010 and 2010 productivity gap

	Annual average growth, %		Difference,	Productivity	Sector share
	2001-2007	2008-2010	%	gap, %	of economy
Output per worker	1.7	-0.9	-2.6	-6.7	
Output per job	1.7	-0.9	-2.6	-6.8	
Of which					
Agriculture, mining and utilities	-2.2	-10.1	-7.9	-21.4	4%
Manufacturing	4.3	0.4	-3.9	-10.4	12%
Construction	1.1	0.9	-0.2	-3.0	6%
Distribution, hotels and catering	3.0	-0.7	-3.7	-8.5	16%
Transport and communications	2.4	-0.9	-3.3	-8.4	7%
Government and other services	0.0	-1.2	-1.2	-3.4	24%
Business services and finance	2.0	0.0	-2.0	-4.3	32%
Of which					
Business services	1.2	0.0	-1.2	-1.8	24%
Business services "proper"	2.3	-0.6	-2.9	-6.3	17%
Financial intermediation	5.4	0.3	-5.1	-13.3	8%
Of which					
Banking	7.7	2.5	-5.2	12.9	5%

Notes: Table sourced from Martin (2011) based on published and unpublished data from the ONS. Output is GVA at basic prices chained volume measure (ONS code ABMM); exact index equivalent (c.f. ONS series code CGCE). Martin infers annual average output, workers and productivity from the quarterly data: the ONS provides an index of whole economy workers (code TXEL) which the inferred series closely approximates. Rounding errors arise because of the use of indices published by ONS to 1decimal place. The growth rates in the first two columns are annual CAGRs rates for Q4 2000 to Q4 2007 and Q4 2007 and Q4 2010 respectively. The productivity gaps are calculated as the difference between outturn productivity and an extrapolated level, based the quarterly CAGRs using the Q4 2000 to Q4 2007 period. For further details see Martin (2011).

Martin goes on to attribute the national productivity shortfall (national GVA per job compared to pre-recession trend) to each sector, distinguishing between a direct impact (the sector's productivity shortfall weighted by its share in total trend output) and an indirect effect which comes from the shift of workers in or out of that sector (this latter effect is larger for sectors with above average trend levels of productivity). He finds that of the total productivity gap of 6.8%, only 0.8% is explained by shifts in employment- with the loss of jobs in finance and business services contributing to this, though for different reasons. The impact of business services has its root in the fact that previously the sector had rapidly expanding employment, whereas the impact of finance is due to it being a high productivity sector in which employment had not previously grown.

In its August 2011 Inflation report, the Bank of England agrees that changes in employment shares from high productivity sectors (such as banking) to low productivity sectors can only explain a small proportion of the productivity gap, and that productivity weakness itself is spread across a range of sectors. Therefore, the most recent analyses suggest that the productivity gap cannot easily be explained by structural changes in the economy with jobs moving permanently from high productivity to low productivity sectors.

4.7 Supply Side Pessimism: Other Evidence

Even if the direct effect of the financial sector cannot account for the pessimists' views of a large fall in potential output, the theoretical indirect effects of the banking crisis could have a more widespread effect. To complement the evidence that the banking crisis has caused major supply side damage, pessimists would point to several other pieces of evidence on growth, oil, inflation, jobs, trade and surveys of capacity utilisation. We discuss these in turn.

Growth

It is correct that past growth is not a guarantee of future growth, so we cannot simply assume that the productivity experience of 1979-2007 will continue in the future, and of course it is wise to take recent history into account. Thus pessimists give more weight in their projections of potential output to the last few years (recall Figures 2.7 and 2.8). The fact that other OECD countries have also taken a growth hit demonstrates that there are common effects at play. Nevertheless, it is hard to be sure that such common growth problems are a symptom of a common supply shock, rather than a common problem of a deep recession compounded by too little aggregate demand. And as discussed above, the theoretical arguments are not dispositive over what has happened to potential output. Our reading of growth theory is that long-run growth is unlikely to be affected as this is determined by fundamentals such as human capital, institutions, the innovation system and the rule of law. There is likely to be some fall in the level of potential output, but the magnitude is unclear and policy-dependent.

The Decline of North Sea Oil

In addition to finance, the high value added oil sector is in decline as North Sea Oil runs out. This has been a long run trend, however as the rate of productivity growth has slowed since the mid-1990s, and gone into decline since 2003 (see Dale, 2011). In our analysis oil is included within the "other goods producing industries", in the sub-sector "mining and quarrying". The sector overall contributed 0.6 p.p. to productivity growth between 1979 and 1997 but only 0.1 p.p. in 1997-2007[28]. Thus it is not one of the high productivity growth sectors in the Labour period and so it is unlikely to have a material effect on the overall productivity position.

Inflation

For pessimists high recent inflation has been an indicator that the economy is near full capacity. However, the key indicator of being near full capacity is domestic wage inflation. This has been extraordinarily subdued during the current recession. Real wages have fallen significantly which is something which was not witnessed in the 1980s and 1990s recession. Real wages have also been much more subdued than in other countries which were also

[28] Dale (2011) considers that the productivity gap is 9% based on extrapolating a pre-crisis trend from Q1 1987 to Q1 2008, and comparing to actual productivity. He then re-estimates the scale of the productivity shortfall using more plausible estimates for trend productivity in both the financial services and energy extraction sectors, obtaining a reduction of 2pp. The majority of this 2pp difference is due to slower underlying productivity growth in the energy extraction sector. In his analysis, the pre-crisis period includes the late 1980s to mid-1990s when productivity in energy extraction was increasing rapidly (see Chart 4, Dale (2011)). Our analysis in Section 1 looks at the 1997-2007 period, and therefore excludes the 1987-1995 period of rapid productivity growth. Therefore, our average annual productivity growth rate of 2.8% does *not* rely on a rapidly growing oil sector. In fact that average rate of productivity growth of "mining and quarrying" (which includes energy extraction), was negative at -2.9% per annum over 1997-2007. The average share of market economy GVA of this sector was 3% during this period. Mining and quarrying is within "other goods producing industries together with "electricity, gas and water supply", "construction" and "agriculture, hunting, forestry and fishing" – all sectors which saw average productivity increases over the period 1997-2007.

severely affected by the recession such as Spain. Low wages reflect the increased flexibility of the labour market in the UK compared to previous recessions, partly reflecting changes in union membership. For example, in 2010 only 24% of workers were in trade unions compared to over half in the early 1980s recession. In the private sector the proportion is only 14%[29]. This wage flexibility is probably the major reason why employment rates have remained high in the UK despite the 7% fall in output, which was far greater than all other recessions since the World War II. An additional reason for lower than expected unemployment is a better functioning Employment Service which attempts to keep job seekers attached to the labour market rather than shifting them into other benefits or not enforcing work search.

Inflation has been mainly driven by escalating import prices associated with the fall of the exchange rate, an increase in VAT and rising high commodity prices. Overall, domestic sources of inflation – wages and profits per unit of output have remained subdued (BoE, August 2011).

Employment

As a matter of arithmetic the fall in labour productivity is because output has fallen while employment has held up in the UK. In the US labour productivity looks good because employment has dropped by a lot more.

Private sector employment rose in 2010 and 2011 and this is interpreted by pessimists as a further sign that there really has been a large negative supply shock. If firms were labour hoarding during the temporary downturn in demand then they would have responded by expanding output rather than hiring. Thus, more hiring is taken as a sign that productivity is genuinely lower and spare capacity is limited.

There is a different interpretation of the events however. First, the rise in private sector employment was hardly spectacular. After falling by 4.2% in 2008-2009, it rose by 1.5% in 2009-2010 and by only 1.1% in 2011-2010[30]. Second, there was some expectation of coming out of the recession, especially with government stimulus in the UK and overseas. Third, as already noted wages are also low, encouraging job creation. So firms may have hired with the hope of continued better demand out-turns. Subsequently, demand has been lower than expected as fiscal consolidation bites and the global outlook darkens. Again, it is unclear that better than expected job outcomes should be interpreted as firms' response to a big permanent fall in productivity.

Additionally, it is very relevant to the current outlook what view is taken of equilibrium unemployment (NAIRU). Even though current unemployment rates are lower than we might expect from earlier recessions, they are still high by historical standards at around 8%. Most estimates of the NAIRU are still around 5-6% which suggested considerable room for demand expansion without igniting inflation.

Surveys of Capacity Utilisation

If some sectors were operating above their normal level of capacity prior to the downturn then this could account for some of the productivity fall. Dale (2011) reckons this could account for 1 percentage point. But since the trends noted above were over the whole 1997-2007 period, there would have to be above average capacity utilisation over the period taken

[29] www.bis.gov.uk/assets/biscore/employment-matters/docs/t/11-p77-trade-union-membership-2010.pdf
[30] ONS Labour Market Statistics database 12th October 2011.

as a whole. Furthermore, the responses to these surveys are hard to interpret as discussed in sub-section 0.

Trade

Giles (2011b)emphasises that the UK's trade performance has been unexpectedly bad in a way that is consistent with a larger permanent fall in productivity. Despite a 20% fall in the value of sterling over the past 4 years, there has been little import substitution and only a similar level of exports to pre-crisis. The UK has done no better than Spain, for example, which is (currently) still in the Eurozone.

It is certainly true that these trade figures are disappointing, but it is unclear how much we can conclude from them in terms of productivity issues. Amongst possible explanations, there is a well-known J-curve effect in trade whereby a depreciation in the exchange rate can take several years before having an effect on trade (Carlin et al., 2001). At first, a depreciation may actually worsen exports, for example, as quantities take time to adjust and prices change. So the value of exports usually falls (all else equal) immediately after a depreciation, even if the quantity of exports do not. Eventually these should adjust too, though, so the UK's poor trade performance remains somewhat of a puzzle.

Summary on evidence over supply side pessimism

The supply side pessimists have arguments that are cogent and cannot be dismissed. But the evidence of a large and permanent fall in potential output (and trend productivity growth) can all be contested. Certainly, the data on the financial and oil, growth, inflation, jobs and surveys does not seem compelling. The trade data is perhaps the biggest concern.

4.8 A More Optimistic View

One bit of optimism is that the GDP numbers may well be understated. Dale (2011), for example, notes that the Monetary Policy Committee (MPC) believes that actual productivity is about 1.8 percentage points higher than the current numbers suggest.

Even with this adjustment, a sizeable gap remains in current productivity from pre-crisis levels. The pessimistic view is that this is mainly a negative supply shock. The alternative view is that weak demand is constraining economic activity. Real wages have fallen, containing the rise in unemployment and leaving overall profitability at an acceptable level. Inflationary pressures have come from world commodity and factor prices. Under this view, there has been, at least until recently, large-scale labour hoarding combined with a fall in average hours worked implying the existence of spare labour resource ready to meet a recovery in demand. Pre-crisis trends in productivity can be resumed as the economy has not suffered much permanent damage to its supply potential.

Of course a prolonged period of weak demand can itself lead to supply-side damage (through a loss or lack of investment in skills, or destruction of capital) and therefore a vicious cycle. Labour market factors may also be important here, including the growth in unemployment – especially youth unemployment and long term unemployment. As mentioned above, there may be a loss of skills; less job related training and so on. These hysteresis factors can prolong the consequences of the downturn. This fact has prompted debate into whether the austerity package, based on the "supply side" view, may actually become self-fulfilling even if the "demand side" view is closer to the truth (Wolf, 2011). We discuss austerity under the rubric of short to medium term growth strategies in the final section.

4.9 Summary on Output Gaps and Productivity

There is huge uncertainty over whether the more pessimistic or optimistic view of the economy is closer to the truth. Pessimists see the current level of output as near full capacity whereas optimists believe there is a substantial output gap and room for demand expansion without sparking more inflation. Most commentators take a position between these two extremes seeing that there is some permanent loss of output and (perhaps) a permanent fall in the trend rate of growth. The difference between the realistic optimists and pessimists is how large or small these changes are, and this leaves room for reasonable people to disagree.

In our view, it is likely that some capacity has been destroyed, while at the same time a lack of demand is depressing productivity, but the precise size of the output gap is uncertain. Based upon our analysis it does not appear that the recession is simply a bursting of the financial bubble with no hope of returning to pre-recession growth trends. Consequently, we would tend towards the more optimistic view of the UK economy.

We now turn to the issue of what policies for growth should be pursued in the light of our analysis in the short to medium run and in the longer run.

5. Policies for Long-Term Growth

5.1 Introduction

Our report has analysed the UK's recent experience of growth. The period since 1997 has been better than is commonly thought as much has been coloured by the Great Recession. In our view the Labour years 1997-2010 were a successful period in terms of GDP per capita and productivity growth with a continuation of the good rate of productivity growth from 1979. The last 30 years marked a sharp break in the relative decline of the UK compared to other advanced nations since the late Nineteenth Century, a decline that was flattered for the most part by the benign economic conditions in the Post-war recovery (see Table A5).

We end with some thoughts on what this means for growth policies. Promoting long term growth is about how we expand the potential of the economy, whereas recovering from recession is about how we ensure that the economy runs at its current potential. At present we need policies for both[31].

Building on our analysis in the earlier parts of the report we look first briefly at growth policies in the short-run. Turning to the long-run, we examine *principles*, *practices* and *particulars* for growth policy. This is meant to stimulate further thought and lay out an agenda rather than providing definitive answers.

5.2 Growth Policies in the Short and Medium Run

The view that one takes of the UK's productivity performance is an important (although by no means the only) influence in how to regard the policy stance over the next 4-5 years. Many of factors that will determine UK growth and productivity are outside the direct influence of economic policy – the Eurozone crisis, the development of the Arab Spring (which has influenced oil prices), US policy stalemate over public debt and the sustainability of growth in India and China will be more important than the exact macro-economic position of the UK. Nevertheless, UK policy still matter to some degree.

[31] Some of this is based on work done by Dan Corry and colleagues for a report for Centreforum, see BEATSON, M., CORRY, D., LEUNIG, T., NICHOLSON, C. & PRYCE, V. 2011. Growth Matters: Why the Budget must be for the long term. *CentreForum, FTI Consulting*.

The urgent question facing the government is the fiscal stance and whether to continue with "Plan A". This is to eliminate the structural deficit within five years. The planned fiscal consolidation announced in the July 2010 Emergency Budget was based upon this strategy was a mixture of tax rises and spending cuts amounting to 7% of GDP by 2014/15.. Various alternative "Plan Bs" have been put forward which have a slower degree of fiscal consolidation. Labour's March 2010 Budget suggested a consolidation of 5% of GDP by 2016/17, for example, with further consolidation afterwards to eliminate the structural deficit. There have been many calls to slow down the rate of fiscal consolidation for example by temporarily reversing the increase in VAT taxes, reducing employers' National Insurance (especially for the young), or slowing the cuts to public spending.

Much has happened since the July 2010 Budget. In particular, UK growth has been more anaemic than expected. Whether the austerity programme was a partial cause of this slowdown is fiercely debated: growth started slowing down before the major cuts in public spending started to bite, but public sector job cuts are now much larger and expectations of spending cuts could also have a depressing effect on demand. Regardless of the causal influence of austerity, the policy response to the slowdown of growth depends crucially on whether one regards this as driven by fundamental supply side weaknesses or demand side problems. If one believes that slow growth is driven by a weaker supply side due to low productivity, then attempts to stimulate demand through monetary policy or by slowing down the fiscal austerity program will be ineffective because this will merely stoke up inflation. In this "pessimistic" scenario, there is a case for actually accelerating the austerity program in order to meet the Chancellor's fiscal plans.

If one believes that the slowed growth is primarily a demand phenomenon and that the output gap is much greater than zero (see the previous section) then this leaves a greater role for a "Plan B". Overall, our analysis suggests that the output gap may be larger than many pessimistic commentators assume because of (i) the strong productivity performance leading up to the Great Recession and (ii) the fact that this performance was not driven primarily by finance, property or oil.

To Plan B or not to Plan B? That is the question

Believing that there is a large output gap does not automatically imply that the government must depart from its Plan A for fiscal consolidation. There are at least three reasons for this: the monetary policy alternative, the efficacy of fiscal policy and the issue of (bond market) confidence.

First, there is the question of whether monetary policy can deliver the necessary boost in demand. In normal times, monetary policy is the natural tool to reach for – it is much easier to fine-tune than fiscal policy and less likely to be wasted by politicians in "vanity projects". These are not normal times, however. The UK monetary authorities (and the Federal Reserve and the ECB) are keeping interest rates low. There are rounds of quantitative easing, but there are strong limitations over what monetary policy can achieve when the interest rate is close to zero as it currently is. Fiscal policy becomes more attractive in these periods, especially those that can be more easily reversed such as temporary cuts to VAT and/or employer NI contributions (as recommended by our colleague Nobel Laureate Chris Pissarides[32]) or reversing some of the planned cuts in building investments (e.g. on schools, road and rail). These are not permanent increases in the public sector headcount or wages which are harder to reverse.

[32] http://www.newstatesman.com/economy/2011/10/deficit-recession-vat

Second, there is the issue of whether domestic fiscal policy actually works at all. Our CEP colleague, Ethan Ilzetzki[33] has produced the best evidence on fiscal multipliers and (like the IMF) rejected the more extreme claims that the multiplier is zero and that austerity can boost demand through expectations of smaller future public debts. He does find, however, that consistent with the Mundell-Fleming model fiscal policy is less effective in countries like the UK with floating exchange rates. However, there are sizeable standard errors around his estimates and they do not distinguish between spending during a deep recession, when fiscal policy is likely to be effective, and more normal times.

Third, there is the vexed question of "confidence" in the bond markets. The Coalition government's main argument given for frontloading the fiscal consolidation was to restore confidence in the financial markets over the credibility of the deficit reduction plan. The concern was that UK debt levels were unsustainable and that government borrowing costs would rise (as they have done for Greece, Portugal. Spain and Italy) in the absence of such a Plan A. This is a question of market psychology and there are at least two parts to the confidence question. The first issue is whether in 2010 frontloading the fiscal consolidation (compared to Labour's plans) meant that borrowing costs fell significantly? Recall that the March 2010 budget of Alistair Darling had already proposed a tough plan to reduce the deficit. We argued in the previous section that although it was Labour's policy mistake not to have reduced the deficit in the pre-crisis period by more, debt and deficit levels were not very high and even today's levels in historical perspective are quite manageable. It is certainly true that borrowing costs for the UK at the time of the election were low and have remained low despite market turmoil. But is that because of confidence in the government's fiscal hair shirt or the markets' belief that the economy is going to be stuck at a very low growth rate and so the MPC will keep interest rates low? The evidence seems more consistent with the latter interpretation[34].

The second part of the confidence question is whether the Chancellor is right to stick to Plan A because to depart from it would radically undermine his credibility. In other words, even if the original Plan A was a mistake relative to Labour's previous fiscal strategy, it is better to stick with it to avoid scaring the markets. It is hard to believe that the markets would punish a slowing down of fiscal consolidation in light of worse economic news, especially if the Plan B was based around sensible capital investment projects or temporary tax cuts.

Summary on short-term plan for growth

One view is that given slower growth (due to a supply side shock) we need to further tighten austerity to meet the government's target to eliminate the structural deficit. We would argue against a further tightening of austerity and tend to side with those who are calling for a "Plan B" which actually slows down the current rate of deficit reduction. The attempt to meet this target is likely to cause economic harm and reduce long-term potential output.

Space limitations mean that we do not enter a more detailed debate here on the exact changes to the fiscal stance a Plan B would involve, e.g. the mix between temporary VAT cuts, payroll tax reductions, slowdowns in the cuts of public investment in schools, roads and other capital projects[35]. The plan to have a medium credible deficit reduction needs to be combined

[33] http://cep.lse.ac.uk/pubs/download/dp1016.pdf

[34] One test (Portes, 2011) is to look at the correlation between changes in 10 year gilt yields and measures of confidence in UK growth such as the stock market and exchange rate. The evidence here is the opposite of the government's argument. The correlation between these three indicators is strongly positive since May 2010. In other words, borrowing costs fall when the stock market falls and when sterling falls. Falling borrowing costs are an indication of lack of confidence in UK economic growth rather than an endorsement of fiscal prudence.

[35] For more discussion see PORTES, J. 2011. The Coalition's Confidence Trick. *The New Statesman*.

with sensible shorter run policies to avoid an (unintended) co-ordinated bout of international austerity.

Whatever the short and medium-run responses to the current crisis are, we need a longer-run strategy for growth in order to restore fiscal and economic health. We now turn to this.

5.3 Long-Run Growth Policies: Principles

We will go into some policy details below, but it is useful to begin with five broad principles for long-run growth. First, we have learned some things from academic research into growth. Modern growth theory stresses the fundamental importance of innovation and human capital. Recent developments have shown that aggregate productivity is driven as much by the reallocation of activity towards the more productive firms and away from the less efficient (creative destruction) as improvements within long-lived firms. Competition is vital to both innovation within firms and the Darwinian process of natural selection between firms.

Research also shows us something about the importance of agglomeration and of incentives and governance at sub-national levels – all of which points to the importance of cities and city-regions as centre of growth and productivity. Other work – and comparisons across countries - suggests one needs a combination of patient capital and good corporate governance, alongside things like venture capital, to encourage investment and innovation.

Second, we have also learned something from the experience of the UK economy in Sections 1 and 2**Error! Reference source not found.** and this in part supports some of the academic analysis in the growth literature. As discussed in Section 3, the improved UK productivity performance since 1979 that continued after 1997 was built upon improvements in product market competition, the accumulation of human capital, balanced regulation (although with a major failure on finance), and innovation policies.

Third, there is a difference between policies that improve the labour market and those that improve productivity. While both are to be welcomed, this report has been focused less on jobs growth and more on how more output can be obtained from these jobs (i.e. productivity). Although at the firm level, boosts to productivity will generally increase sales and therefore employment growth, policies that improve productivity at the macro level do not necessarily mean more employment (although to the extent real wages increase this may draw more people into the labour market and out of welfare). Similarly, it is an error to believe that since measured productivity will often fall when we bring less skilled workers into the workforce, there is a trade-off between productivity and jobs. Potential output is improved by expanding the effective labour force and there is no reason to expect overall efficiency (TFP) to fall as the job market expands.

Fourth, everyone should confess their ignorance on growth. There is no single "magic bullet" to growth and there is a desperate need to draw together the best international evidence and brainpower to analyse the experience of growth and what policies can influence it. It is a scandal that there are still so few rigorous quantitative evaluations of productivity (and other) policies and there remains poor funding to look into what works. The growth of Growth Commissions is to be welcomed in this respect, if these promote the sifting of the evidence and the stimulation of better thinking. The acceptance of fallibility in our knowledge places a premium on experimentation, evaluation and learning in policies – not the assumption that

the expert knows what to do and the government machine needs merely to have its lever pulled to deliver[36].

The development of sensible growth policies based on sound analysis is necessary but not sufficient for success. These policies have to be adopted by governments and effectively implemented. The current machinery of economic decision making and implementation in the UK does not seem fit for purpose (Corry, 2011b). Alongside the analysis of how to improve growth policies is a need to understand how best to deliver them.

Finally, we have to move beyond the "laundry list" approach to growth policies. Prioritising key areas is the right approach, but bullet points of piecemeal reforms (which we will of course do below!) are insufficient. There has to be greater awareness of the complementarity between growth policies, prioritisation of where to focus efforts and a strategy to deliver this. Elsewhere we have described this "Plan V" for growth (Valero and Van Reenen, 2011), where the "V" is for a V-shaped recovery as opposed to the double dip recession that we may be heading into.

5.4 Long-Run Growth Policies: Practices

The most important aspect of a productivity growth strategy is to get the general structural conditions right. This involves some basic pre-requisites such as low corruption, a reasonable level of trust, effective rule of law, democracy, open labour and product markets and so on. Most OECD countries like the UK possess these assets. For a country like Britain, the environmental conditions for growth include sensible regulation (especially over competition policy and planning), a good human and physical capital infrastructure, a stable and transparent tax system, effective spatial governance system and a properly regulated financial system. The next sub-section discusses some of these in detail.

An important issue is whether we can go beyond prescriptions for growth that simply focus on the broad economic environment and consider more specific and pro-active interventions. Economists have been rightly wary of a more interventionist stance because it smacks of discredited "industrial policy" and "picking winners". Despite this most governments do have a *de facto* industrial policies (e.g. towards exports and FDI), so some advice on the best way to do it is useful. And recent work does suggest some role in principle for industrial policies (Aghion et al., 2011).

What would a more pro-active growth strategy look like? In our view an effective long-run growth policy requires governments and civil society to consider two key factors. First, where are the likely areas of growth? Second, where does the UK have some comparative advantage? This comparative advantage might be revealed in current patterns of export activity or it could be latent and this harder to discover without experimentation. The latter may be important when there are some public goods which hold the sector back from developing such as skills or local public infrastructure. The intersection between the areas of global growth and comparative advantage is where policy makers should focus. Are there barriers stifling the potential growth of these industries in the form of laws, regulations and policies that could be removed? Are there some pro-active policies that could foster the development of such sectors? The government is inevitably involved in one way or another as procurer, regulator, and investor across many fields and in many sectors so that sensible,

[36] This is very much in the spirit of LSE Nobel Laureate Von Hayek. See HARFORD, T. 2010. *Adapt*, Great Britain, Little Brown. for a recent treatment.

considered use of its leverage can be used to help key sectors (without creating competitive distortions)[37].

This type of analysis can be done at a local level as well as a national one. It should involve key players – not just policy makers, but also business people. It is more a way of thinking than a particular prescriptive set of policies (Rodrik, 2007).

It is easy to offer examples of such a Plan V. Guessing future growth sectors may seem like a fool's errand but we do have some ideas of where these are – for example, healthcare, education, green technologies, business services and digital businesses. Similarly the UK has clear comparative advantages in areas such as bio-pharmaceuticals, financial and business services, creative industries and some areas of ICT (e.g. ARM). So the task is not hopeless – it is hard to be precise, but there are examples, such as higher education.

Higher Education is a sector where the UK has some comparative advantage with globally recognised universities that attract the second largest proportion of overseas students in the world. In order to create a better higher education market, the increase in the fees cap and the reduction in direct subsidy are the right direction of travel, even though the speed and uncertainty are creating severe problems. More damaging, however, is the decision to cap net immigration at 100,000 per year, as well as the cut in "tier 1" visas for the exceptionally talented and the threat to the Post Study Work Visa. This is economic suicide, and the government should be doing the exact opposite – making it much easier for the very talented to come to the UK to work and study. This will boost a major sector, increase innovation and productivity and may even help curtail inequality by providing more competition for the highly educated.

More generally education and health are likely to be growth sectors all over the world in the next few decades[38]. Ensuring that the UK exploits its many advantages in these sectors is important for prosperity and jobs.

5.5 Long-Run Growth Policies: Particulars

Having eschewed the laundry list approach, we will still look at some key particular policies that are important for long-term growth.

Public sector productivity

One area where the state has a very direct role is in public sector productivity. This remains an issue – not only in the UK but across the developed world. Public services of health, schooling and policing are what economists describe as "superior" goods – the share of family budgets devoted to these public goods increases as the family becomes richer (unlike say, food). And this is also true of societies - the share of national income devoted to these services (especially healthcare) seems to inexorably rise over time and, since they are mostly tax payer-funded, this is a great challenge in a time of austerity.

Public sector productivity in the UK has been flat or declining since 1997. It is hard to measure of course, but even when one makes extensive adjustments for measurement problems (see the 2005 Atkinson Review for example), public sector productivity growth lags hugely behind that of the private sector.

[37] See LENT, A. & LOCKWOOD, M. 2010. Creative Destruction: Placing innovation at the heart of progressive economics. *IPPR*.
[38] See MCKINSEY 2010. From austerity to prosperity: seven priorities for the long term. *McKinsey Global Institute*.

So how can public sector productivity improve? In the second term of Tony Blair, there was an extensive attempt to inject greater competition into the public sector, in order to improve choice and increase diversity. This went alongside a substantial increase in public expenditure after 1999.

In healthcare, there is a growing body of research that suggests that these quasi-market reforms started to improve healthcare after the mid-2000s. The combination of greater autonomy (e.g. Foundation Trusts), money following the patient (e.g. "Payment by Results"), and greater patient choice with information (e.g. "Choose and Book") gave sharper incentives to hospitals to attract patients through improving quality (Bloom et al., 2010, Cooper et al., 2010, Gaynor et al., 2010). Three recent econometric studies have all found that this competition significantly raised clinical quality and efficiency (Cooper et al., 2011). And furthermore, this improvement was especially strong for low-income patients.

Of course, one needs to be very careful that in markets where there are so many asymmetric information and other market failure issues, such moves do not in fact have the opposite effects and simply push up costs – especially where the private sector is involved. Much depends on the particular circumstance and the way that quasi markets are implemented and regulated. For example, the decision to remove price competition from the current Health Bill was correct as otherwise competition could reduce clinical quality as it did in the Internal Market Period (Propper et al., 2008).

A second way to improve public sector performance is to allow more geographical variation in public sector pay, which would involve moving away from national public sector pay bargaining. Propper and Van Reenen (2010) found that the heavily regulated national pay systems in the UK health system have been causing large numbers of unnecessary patient deaths, especially in London and the South-East. Allowing public sector pay to reflect local conditions would rebalance public services geographically and save more lives. A further advantage of greater public sector wage flexibility is that the high level of public sector pay makes it difficult for the private sector to attract skilled labour and so acts as a potential brake on business activity. On the other hand, such changes should not be used as a mechanism to make depressed regions compete simply on low wages. That cannot help us in many tradable areas where countries compete on wages way below the UK minimum wage, and where, due to their poor economic state, there is little demand for lower pay, non- tradable, service sector jobs (Beatson et al., 2011).

The lesson appears to be that intelligent policies to improve product market competition and enhance labour market flexibility are ways of improving productivity in the public sector, just as they have done in the private sector.

Financial markets

The Great Recession was preceded by the worst financial crisis since the Second World War. There were multiple causes of the financial crisis (Garicano, 2010, Reinhart and Rogoff, 2009, Turner et al., 2010), but poor regulation was undoubtedly one factor and the first critical issue is how to improve regulation to mitigate the risks of future crises. While corporate governance is vital overall, despite some reform, it is still weak in the UK. Furthermore, we are sceptical of the view that poor corporate governance was the main cause of the financial crisis as there appears to be little correlation between better measures of corporate governance and bank performance during the crisis. More likely, agents in the financial markets were responding to the incentives they faced (see sub-section 4.3). The knowledge that large banks which posed systemic risk were likely to be partially bailed out as they were "too big to fail" meant that the costs of taking on excessive risk were lower than they should

have been. There were also strong incentives to disguise the true underlying risk by making the exotic financial instruments more complex and opaque to game regulators and credit rating agencies (which also faced their own deep moral hazard issues). Since the rewards on the upside were tremendous, but the costs on the downside were muted all players from the trader working for a huge annual bonus, to the CEO to the Board of Directors had incentives to take on too much camouflaged risk.

Systemic risk can be mitigated in a number of ways through higher capital requirements (Basel 3), living wills, greater transparency and more vigilant regulation. But some type of separation of the "utility" part of banking (for example in retail, which has taxpayer insurance) from the "casino" part of banking (investment, which does not) is necessary. The Vickers Report (Vickers, 2011) moves in this direction, but there remains a question of whether it goes far enough to structurally separate the utility from the casino parts of banking since both activities will remain within the universal banks and whether it will lead to a more diversified sector.

These are necessary long-run reforms, but there is an immediate problem concerning Small and Medium sized Enterprises' (SME) access to finance. Indeed, some of the reforms such as higher capital requirements will make this problem worse as banks are re-building their balance sheets by severely restricting lending to build up such capital buffers. More generally there remains an issue as to whether we have the right portfolio of support to encourage finance for start-ups and post-entry growth. A fundamental point is whether the UK could benefit from a bank to help finance these areas - like the KfW in Germany[39]. The Green Investment Bank could play this role to a degree but there are perhaps other sectors that could do with such a body.

Higher education

The UK has an extremely strong higher education sector. The world rankings are dominated by the US, but the UK is unique in having so many universities appearing alongside these much better financed American schools – for example, in the top 10 of the 2011 Shanghai rankings, Cambridge and Oxford are the only two non-US universities[40].

There are several economic functions of higher education. First, there is the supply of high quality human capital. UK universities have allowed the proportion of people with a college degree to rise massively since 1997. Second, there are innovations flowing from science to industry. The UK is second only to the US in elite science (and ahead of it in scientific productivity as measured by citations and prizes per dollar spent). With less than 1% of the world's population the UK produces over 14% of the most highly cited scientific publications. The concern for the UK is whether or not this academic prowess can be translated into commercial innovations, in the same way MIT or Stanford are able to do. In some areas this has been highly successful, such as bio-pharmaceuticals, but generally this has not been the case.

Third, and less emphasised is that higher education is a major export industry. In the market for overseas students, the UK has the second highest world market share and has been gaining on the US since 9/11 when America sharply restricted its visa policies. There are about 3.3 million overseas students and the market for these overseas students is growing at about 7% a year. These students could be worth £5bn to the UK in tuition fees alone if we can maintain our market share (McKinsey, 2010).

[39] http://www.kfw.de/kfw_/kfw/en/
[40] http://www.arwu.org/ARWU2010.jsp

One of the reasons for the UK's success compared to the other countries has been the high degree of autonomy research-based universities have enjoyed. This trend is continuing as the state withdraws even more subsidy from the system, and universities respond by raising fees. There is certainly a concern with the transition, but also with financial viability, especially in the short-term.

The main current danger to the university system is from an unexpected quarter: immigration policy. The commitment to cut net migration to fewer than 100,000has proved almost impossible due to the fall of emigration and free movement of people around the EU. Consequently the government has tightened the rules for visas for exceptionally highly qualified people and students. This is dramatically self-defeating. It has made it much harder for universities to recruit their customers in overseas students and acquire top notch faculty. Whereas there have been exceptions made for highly paid business people, the government does not seem to realise the damage it is doing to one of its key industries. It is hard to imagine a worse anti-growth strategy.

Immigration

We now turn more directly to the role of immigration. As mentioned the current government has a policy of reducing net immigration to the "tens of thousands" whereas the Labour government – intentionally or not - presided over a period of large inflows of immigration regularly exceeding 200,000 per annum. In 2009 14% of the UK's working population was born abroad, almost a doubling from the level in 1995 (8%). This was in part explicitly policy-driven and partly a reflection of the strong relative jobs market that attracted many migrants (e.g. from Eastern Europe).

There is an extensive literature on whether immigration had a negative effect on wages and unemployment of natives. Broadly, the answer appears to be that this wave of immigration, like those studied in other countries, had little harmful effect on the job market prospects of natives (except a small effect on the labour market prospects of the most unskilled workers)[41]. The UK's labour market appeared able to absorb migrants in large part without disruption.

A tougher question to answer, however, is whether this wave of immigration was beneficial to growth. Mechanically, immigration will swell the size of the population and therefore add to absolute GDP. But this is largely irrelevant from a welfare point of view – what matters is whether immigration improved the material wellbeing of natives, the people already in the country, or more precisely for our purposes, does it raise productivity levels and growth. Many economists feel instinctively that it should. There is much evidence that openness to the movement of goods[42] has positive dynamic effects on productivity and innovation through the spread of ideas and competitive pressure, so why not the free movement of people? This idea seems particularly appealing for immigration of the highly skilled, which are more likely to stimulate innovation, support a comparative advantage for the UK in higher productivity goods and services and (if anything) put downward pressure on inequality by increasing the supply of human capital. Indeed, the points-based migration system introduced by the last government (and modelled on success stories like Canada) was intended to be strongly biased to the most skilled.

[41] See DUSTMANN, C., FRATTINI, T. & PRESTON, I. 2008. The Effect of Immigration along the Distribution of Wages. *CReAM Discussion Paper No. 03/08* and MANACORDA, M., MANNING, A. & WADSWORTH, J. 2006. The Impact of Immigration on the Structure of Male Wages: Theory and Evidence from Britain. *IZA Discussion Papers 2352*.

[42] For example, the impact of opening up trade with China appears to have had large dynamic benefits on the UK and other countries (BLOOM, N., DRACA, M. & VAN REENEN, J. 2011a. Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity. *NBER Working Paper, 16717*.).

Alas, the evidence for such positive dynamic effects of high skilled immigration is very limited. Some US studies have found that very high skilled migrants (like PhD scientists and inventors)[43] do create such innovation benefits and this supports the argument that scientists and entrepreneurs should be allowed to move into the UK as freely as soccer players. But we simply do not know whether such effects exist for say those with college degrees. Moreover, although immigrants are on average better educated and younger than the UK born, the pattern is rather "bimodal" with a hump of extremely highly educated and another hump of very poorly skilled. Finally, although British rates of immigration rose a lot under Labour (although they fell after 2006), immigration is rather higher in many other countries like the US and Germany[44].

In summary, it is unclear whether immigration in general has a very strong positive or negative effect on productivity (at least that is the current state of the evidence). Allowing a maximally free movement of very skilled workers, including scientists, however, is a no brainer.

Education and skills

The UK does relatively well at educating the elite. But it performs spectacularly badly at educating and training the bottom third. There have been major improvements in levels, and recent research suggests at least some closing of the class gap between 2006 and 2010 (Cook, 2011). However, the OECD's internationally comparable Pisa studies of 15 year olds show a mediocre position that has not improved. While there have been improvements, adult literacy and numeracy rates remain among the worst in the OECD. The problem is finding policies that (i) keep the young in schooling for longer and (ii) give effective training to the groups who are not likely to go to college.

On the former, the raising of the education leaving age should help. For the latter, Labour's policies like Individual Learning Accounts and the Leitch agenda to push out level 2 qualifications, delivered much less than had been hoped. Apprenticeships are a key policy tool in this area, but it was only towards the end of Labour's period that these were taken seriously enough. The Coalition has expanded the numbers of apprenticeships, but these have been mainly for adults rather than under 19 year olds (and there are some worries on quality and the degree to which they are going to existing employees[45]). The latter group is where there is a particular problem. The current system is too based on certification rather than learning and employers are insufficiently engaged (Steedman, 2010).

Infrastructure

One reason for the UK's historical productivity gap has been a low level of public investment. At the current juncture of very low global interest rates, investment in infrastructure seems a very attractive proposition and is unlikely to scare the markets in the same way that government consumption would.

Rather than relying on "Grand Projet" such as the planned high speed rail links, the government should consider the myriad smaller schemes of road and rail investments that could have larger and less risky returns. The high speed links are also likely to benefit

[43] HUNT, J. & GAUTHIER-LOISELLE, M. 2010. How Much Does Immigration Boost Innovation? American Economic Journal-Macroeconomics, 2, 31-56.

[44] For the data on Labour's record on immigration see WADSWORTH, J. 2010. Immigration and the UK Labour Market: The Evidence from Economic Research. *CEP Election Analysis*.

45 See STRATTON, A. 2011. Jobs rebranded as apprenticeships, government report warns. *The Guardian*, 27 October.

London more than their connected regions, so believing that they are a form of regional rebalancing (even if this was desirable) is an illusion.

Competition

It is clear to us that competition has been key in driving productivity and when it has not been present historically the UK has suffered. We agree with those who believe that the authorities must be vigilant with market investigations and are concerned that present desire to merge the OFT and Competition Commission will only distract from the pressure for competitive markets.

The Single Market has been a major force in driving greater competition in goods across the EU and has brought tremendous benefits. The stalling of greater market integration (e.g. through the watering down of the Services Directive) and more globally the Doha round is holding back productivity. More dangerously, there are increasing calls for trade protection which would almost guarantee a prolonging of the recession, just as happened in the Inter-war period.

Regulation and planning

Regulation in general

Regulation is the area most frequently cited by business people as a barrier to productivity. This is a rather vague, catch-all phrase, and such evidence has to be treated with care. In addition, since much of the UK's regulatory system stems from Europe, UK policy makers are limited in their ability to affect this. Regulation of industry has been relatively light-touch and in the privatised utilities, this has been generally successful. The issue often debated is whether there has been too little of this sort of regulation: we discussed financial regulation already and there are concerns over the energy market.

Labour market regulation

Labour regulation increased since 1997: there were more rights for trade unions (employers have to grant recognition if a majority of workers vote for it), more opportunities for flexible work and maternity/paternity leave, the first national minimum wage and a shorter time period before employees qualified for unfair dismissal. Productivity growth did not seem to falter in the face of these, and the (small) empirical literature examining these do not seem to have uncovered large negative productivity effects (Draca et al., 2011). Of course one could argue it would have been even higher if the UK had not slid down the OECD's rankings of labour market flexibility. The main point, however, is that the UK retains perhaps the most flexible labour markets in the EU and Labour did not return to the heavily regulated labour market of the 1970s with militant trade unions. Indeed, only 24% of employed people were union members in 2010 compared to 29% in 1995[46]. In the private sector, the figure has fallen to 14% (from 21% in 1995), implying that unions are becoming less and less relevant.

Land regulation

Planning is an area where the UK has had historically tough restrictions. On the residential side it is clear that we are not building enough houses to meet our needs (Barker, 2006, Nickell, 2011). On the commercial side, many reports have emphasised how restrictive planning holds back productivity in the retail sector. Chesire and Hilber (2011), for example, estimate that supermarket productivity is reduced by at least 20% in England by land

[46] http://www.bis.gov.uk/assets/biscore/employment-matters/docs/t/11-p77-trade-union-membership-2010.pdf

restrictions[47]. This keeps UK retail productivity much lower than countries like France or the US (McKinsey, (2010), Haskel and Sadun, (2011)). Although the restrictions on major scale out-of- town supermarkets is a trade-off that policy makers (and some of the public) seem to feel is worthwhile, it is an open question whether they realise the true scale of the damage.

In terms of allowing high tech clusters to grow around Oxford and Cambridge, building constraints seem to be a key factor. This is an example of where a more focused growth policy could help. It is likely that software is going to continue to be a globally high growth sector and the UK has some advantages in this area because of strong academic computer science skills. However, there needs to be a relaxation of physical space constraints for growth to occur. It is not unreasonable for people to support land planning restrictions if they place a high disutility on some green spaces being "concreted over". But the costs of such policies in terms of lost output must be made more explicit – too many of the costs of regulation are hidden.

Current policy here is rather ambiguous. On the one hand there has been more devolution of planning which would seem to encourage Nimbyism. On the other hand the new planning guidance seeks to make an assumption in favour of growth when considering applications. On the face of it, this could stimulate more action, although it seems rather untargeted.

Tax

The structure of UK taxation has been the study of an extensive recent report, the Mirrlees Review (IFS, 2009). We agree with most of what was stressed under this review, such as removing the corporate tax bias towards debt and away from equity. The critical thing is not the level of the rates of marginal taxation which has been the obsession of debate in the media and political circles. Around the marginal rates that exist in the UK and most OECD countries, the loss of output from disincentive effects is relatively minor.

The real problem with the tax system is its complexity and instability. Changes are made piecemeal without much regard to how different parts of the tax system interrelate and how the tax system interacts closely with the benefit system (e.g. housing benefits). Furthermore, much could be gained from removing the bias towards financing investment though debt instead of equity. Finally, the encouragement of family firms through the inheritance tax system is a distortion which reduces productivity and should be scrapped.

5.6 Summary on Policies for Long-Run Growth

The purpose of the report is analytical rather than prescriptive. A blueprint for growth is the subject of a future report from a larger commission. Nevertheless, this section has tried to sketch some principles, practices and particulars.

The most important lesson is to try and get the policy environment right in terms of the physical and human capital infrastructure (including e-infrastructure e.g. internet/telecoms), competition, regulation (especially over finance) and tax. Stability, transparency and simplicity are important rather than obsessive tinkering. This will ensure that when opportunities do arrive, the private sector is in good shape to take advantage of these new (and often unforeseen) chances.

[47] Ironically, the effect of the tougher restrictions on building out of town supermarkets introduced in 1996 does not even appear to have helped the independent retailers in city centres. In response to the regulations, Sadun (2008) shows that the big supermarkets simply entered with small format stores like Tesco Express. See SADUN, R. 2008. Does Planning Regulation Protect Independent Retailers? *CEP Discussion Papers Working Paper Series, No. dp0888*.

Beyond this, however, there is a case for a more pro-active growth strategy. The starting point of this is to examine areas where global growth is likely to come from and where the UK has some comparative advantage. The intersection of these is where attention should be focused on removing barriers and fostering development (in the form of local public goods). One example of such a Plan for Growth would include higher education where current immigration policy is explicitly undermining one of the sectors with great potential. The same immigration policy will also hamper business services which have been an engine of productivity growth since the mid-1990s. A second example would be software, where planning restrictions are holding back development of high tech clusters. A third would be bio-medical research where red tape is accelerating the loss of clinical trials in the UK's leading high tech manufacturing sector.

Such a modern "industrial policy" is not about picking winners, but rather a way of thinking about growth that is much better than the current confusion.

References

AGHION, P., DEWATRIPONT, M., DU, L., HARRISON, A. & LEGROS, P. 2011. Industrial Policy and Competition.

ANGRIST, J. & ACEMOGLU, D. 2000. How Large are Human-Capital Externalities? Evidence from Compulsory-Schooling Laws. *In:* BERNANKE, B. S. & ROGOFF, K. (eds.) *NBER Macroeconomics Annual 2000, Volume 15.* MIT Press.

ATKINSON, A. B. 2005. The Atkinson review: final report. Measurement of government output and productivity for the national accounts.

BARKER, K. 2006. Barker Review of Land Use Planning, HM Treasury.

BARRELL, R. 2011. Fiscal Policy in the Longer Term. *National Institute Economic Review,* 217.

BARRELL, R., HOLLAND, D. & LIADZE, I. 2011. Accounting for UK Economic Performance, 1973-2009. *National Institute Discussion Paper no 359.*

BARRELL, R. & KIRBY, S. 2008. The budgetary implications of global shocks to cycles and trends in output. *ESRI Budget Outlook, Dublin*.

BARRELL, R. & KIRBY, S. 2011. Trend output and the output gap in teh UK. *National Institute Economic Review,* 215.

BARRELL, R. & PAIN, N. 1997. Foreign Direct Investment, Technological Change, and Economic Growth Within Europe *Economic Journal,* 107**,** 1770-1776.

BEATSON, M., CORRY, D., LEUNIG, T., NICHOLSON, C. & PRYCE, V. 2011. Growth Matters: Why the Budget must be for the long term. *CentreForum, FTI Consulting*.

BEFFY, P.-O., OLLIVAUD, P., RICHARDSON, P. & SÉDILLOT, F. 2006. New OECD Methods for supply-side and medium-term assessments: A capital services approach. *OECD Economics Department Working Papers No.482*.

BEN-DAVID, D., LUMSDAINE, R. & PAPELL, D. H. 2003. Unit Root, Postwar Slowdowns and Long-Run Growth: Evidence from Two Structural Breaks. *Empirical Economics,* 28**,** 303-319.

BIS 2010a. Economic Growth. *BIS Economics Paper No.9*.

BIS 2010b. UK Trade Performance: Patterns in UK and global trade growth. *Economics Paper No.8.*

BIS, N. 2010c. Annual Innovation Report.

BLOOM, N., DRACA, M. & VAN REENEN, J. 2011a. Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity. *NBER Working Paper, 16717.*

BLOOM, N., GRIFFITH, R. & VAN REENEN, J. 2002a. Do R&D tax credits work? Evidence from a panel of countries 1979-1997. *Journal of Public Economics,* 85**,** 1-31.

BLOOM, N., PROPPER, C., SEILER, S. & VAN REENEN, J. 2010. The impact of competition on management quality: evidence from public hospitals. *CEP Working Paper*

BLOOM, N., SADUN, R. & VAN REENEN, J. 2011b. Americans Do I.T. Better: U.S. Multinationals and the Productivity Miracle. *American Economic Review (forthcoming)*.

BLOOM, N. & VAN REENEN, J. 2007. Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics,* 122**,** 1351-1408.

BLOOM, N. & VAN REENEN, J. 2010. Why Do Management Practices Differ across Firms and Countries? *Journal of Economic Perspectives,* 24**,** 203-224.

BLOOM, N., VAN REENEN, J. & SCHANKERMAN, M. 2002b. Technology Spillovers and Product Market rivalry. *CEP Discussion Paper* No. 675.

BLUNDELL, R., GRIFFITH, R. & VAN REENEN, J. 1999. Market share, market value and innovation in a panel of British manufacturing firms. *Review of Economic Studies,* 66**,** 529-554.

BOE August 2011. Bank of England Inflation Report.

BOE February 2011. Bank of England Inflation Report.

BOE November 2009. Bank of England Inflation Report.

CARD, D. & FREEMAN, R. B. 2004. What have two decades of British Economic Reform Delivered? *In:* CARD, D., BLUNDELL, R. & FREEMAN, R. B. (eds.) *Seeking a Premier League Economy: The Economic Effects of British Economic Reforms, 1980-2000.* Chicago and London: University of Chicago Press.

CARLIN, W., GLYN, A. & VAN REENEN, J. 2001. Export market performance of OECD countries: An empirical examination of the role of cost competitiveness. *Economic Journal,* 111**,** 128-162.

CERRA, V., PANIZZA, U. & SAXENA, S. C. 2009. International Evidence on Recovery from Recessions. *IMF Working Paper Series,* WP/09/183.

CERRA, V. & SAXENA, S. C. 2008. Growth dynamics: The myth of economic recovery. *American Economic Review,* 98**,** 439-457.

CHESHIRE, P. & HILBER, H. 2011. Land Use Planning: The Damaging Impact on Retail Productivity. *CentrePiece* Summer

COOK, C. 2011. Poorer children close education gap. *Financial Times,* 30 September.

COOPER, Z., GIBBONS, S., JONES, S. & MCGUIRE, A. 2010. Does Hospital Competition Improve Efficiency? An Analysis of the Recent Market-based Reforms to the English NHS. *Centre for Economic Performance*.

COOPER, Z., GIBBONS, S., JONES, S. & MCGUIRE, A. 2011. Does Hospital Competition Save Lives? Evidence from the English Nhs Patient Choice Reforms. *Economic Journal,* 121**,** F228-F260.

CORRY, D. 2011a. Labour and the Economy, 1997–2010: More than a Faustian Pact, . *In:* DIAMOND, P. & KENNY, M. (eds.) *Reassessing New Labour: Market, State and Society under Blair and Brown*

CORRY, D. 2011b. Power at the centre: is the national economic council a model for a new way of organising things? . *The Political Quarterly,* 82**,** 459–468.

COTIS, J.-P., ELMESKOV, J. & MOUROUGANE, A. 2005. Estimates of potential output: Benefits and pitfalls from a policy perspective. *In:* REICHLIN, L. (ed.) *The Euro Area Business Cycle: Stylised Facts and Measurement Issues.* London: CEPR.

CRAFTS, N. 2011. British Relative Economic Decline Revisited: The Role of Competition. *CEPR Discussion Paper Series.*

DAL BORGO, M., GOODRIDGE, P., HASKEL, J. E. & PESOLE, A. 2011. Productivity and Growth in UK Industries: An Intangible Investment Approach. *Imperial College*.

DALE, S. 2011. Productivity and monetary policy. *Bank of England,* Speech, 21 September.

DEARDEN, L., EMMERSON, C., FRAYNE, C. & MEGHIR, C. 2009. Conditional Cash Transfers and School Dropout Rates. *Journal of Human Resources,* 44 827-857

DRACA, M., MACHIN, S. & VAN REENEN, J. 2011. Minimum Wages and Firm Profitability. *American Economic Journal-Applied Economics,* 3**,** 129-151.

DUSTMANN, C., FRATTINI, T. & PRESTON, I. 2008. The Effect of Immigration along the Distribution of Wages. *CReAM Discussion Paper No. 03/08*

EC 2001. Economic Policy Committee Report on Potential Output and the Output Gap. *ECFIN/EPC/670/01/en.*

EC 2011. European Economic Forecast. *Commission Staff Working Document, Directorate-General for Economic and Financial Affairs*.

FURCERI, D. & MOURAGANE, A. 2009. The effect of financial crises on potential output: new empirical evidence from OECD countries. *OECD Economics Department Working Papers No. 699.*

GARICANO, L. 2010. Financial Regulation: Can We Avoid Another Great Recession? *CEP Election Analysis.*

GAYNOR, M., MORENO-SERRA, R. & PROPPER, C. 2010. Death by Market Power: Reform, Competition and Patient Outcomes in the National Health Services. *Bristol: Bristol University*.

GENNAIOLI, N., LA PORTA, R., LOPEZ-DE-SILANES, F. & SHLEIFER, A. 2011. Human Capital and Regional Development. *NBER Working Paper No. 17158*.

GILES, C. 2011a. The 14 per cent question. *Financial Times*.

GILES, C. 2011b. Britain needs to buy more from Bognor, not Barcelona. *Financial times*.

GILES, C. 2011c. Busting the myths on the economy. *Financial times*.

GILES, C. 2011d. New Economic Order Threatens Growth. *Financial Times*.

GILES, C. 2011e. Spare capacity doubt clouds growth picture. *Financial Times*.

GILES, C. 2011f. The UK Structural Deficit. *Financial Times*.

GREEN, R. & HASKEL, J. E. 2004. Seeking a Premier-League Economy: The Role of Privatization. *In:* CARD, D., BLUNDELL, R. & FREEMAN, R. B. (eds.) *Seeking a Premier League Economy: The Economic Effects of British Economic Reforms, 1980-2000.* Chicago and London: University of Chicago Press.

GREGG, P. & WADSWORTH, J. 2011. Jobs in the Recession. *CentrePiece Summer 2011*.

HALL, B. & VAN REENEN, J. 2000. How effective are fiscal incentives for R&D? A review of the evidence. *Research Policy,* 29**,** 449-469.

HALTIWANGER, J. C., JARMIN, R. S. & MIRANDA, J. 2011. Who Creates Jobs? Small vs. Large vs. Young. *NBER Working Paper*.

HARFORD, T. 2010. *Adapt,* Great Britain, Little Brown.

HASKEL, J. E., PEREIRA, S. C. & SLAUGHTER, M. J. 2007. Does inward foreign direct investment boost the productivity of domestic firms? *Review of Economics and Statistics,* 89**,** 482-496.

HASKEL, J. E. & SADUN, R. 2011. Regulation and UK Retailing Productivity: Evidence from Microdata. *Economica*.

HASKEL, J. E. & WALLIS, G. 2010. Public Support for Innovation, Intangible Investment and Productivity Growth in the UK Market Sector. *IZA Discussion Papers 4772*.

HAUGH, H., OLLIVAUD, P. & TURNER, D. 2009. The Macroeconomic Consequences of Banking Crises in OECD countries. *OECD Economics Department Working Papers, OECD,* 683.

HMT 2010. Budget 2010: Securing the Recovery.

HOLMES, T. J. & SCHMITZ, J. A. 2010. Competition and Productivity: A Review of Evidence. *Federal Reserve Bank of Minneapolis, Research Department Staff Report*

HUNT, J. & GAUTHIER-LOISELLE, M. 2010. How Much Does Immigration Boost Innovation? *American Economic Journal-Macroeconomics,* 2**,** 31-56.

IFS 2009. Mirrlees Review, Reforming the tax system for the 21st century. *Institute for Fiscal Studies*.

IMF 2010. World Economic Outlook. October.

IMF 2011. World Economic Outlook. October.

JORGENSON, D. W. 2001. Information technology and the US economy. *American Economic Review*, 91**,** 1-32.

LENT, A. & LOCKWOOD, M. 2010. Creative Destruction: Placing innovation at the heart of progressive economics. *IPPR.*

LENT, A. & NASH, D. 2011. Surviving the Asian Century. *IPPR, New Era Economics Report*.

MACHIN, S. & VAN REENEN, J. 2010. Inequality. *CEP Election Analysis*.

MACHIN, S. & VENOIT, J. 2011. Academies and Their Impact on Educational Achievement CEP, UCL.

MANACORDA, M., MANNING, A. & WADSWORTH, J. 2006. The Impact of Immigration on the Structure of Male Wages: Theory and Evidence from Britain. *IZA Discussion Papers 2352*.

MARTIN, B. 2011. Is the British Economy Supply Constrained? A Critique of Productivity Pessimism. UK Innovation Research Centre, CBR, University of Cambridge, Imperial College London.

MCKINSEY 2010. From austerity to prosperity: seven priorities for the long term. *McKinsey Global Institute*.

MCNALLY, S. 2010. Evaluating Education Policies: The Evidence from Economic Research. *CEP Election Analysis*.

MENEZES-FILHO, N. & VAN REENEN, J. 2003. Unions and innovation: A survey of the theory and empirical evidence. *In:* ADDISON, J. & SCHNABEL, C. (eds.) *International handbook of trade unions* Cheltenham: Edward Elgar.

METCALF, D. 2003. Unions and productivity, financial performance and investment: international evidence. *In:* ADDISON, J. & SCHNABEL, C. (eds.) *International handbook of trade unions.* Cheltenham: Edward Elgar.

MORETTI, E. 2003. Human Capital Externalities in Cities. *NBER Working Paper No. W9641*.

NICKELL, S. 1996. Competition and corporate performance. *Journal of Politicial Economy,* 104(4):**,** 726-46.

NICKELL, S. 2011. Too Many People in Britain? Immigration and the Housing Problem *Centre for Economic Performance 21st Birthday lecture series, Tuesday 21 June 2011*.

O'MAHONY, M. & TIMMER, M. P. 2009. Output, Input and Productivity Measures at the Industry Level: The EU KLEMS Database. *Economic Journal,* 119**,** F374-F403.

OBR 2010. June 2010 Pre-Budget Forecast.

OBR 2011a. Briefing note no.2: Estimating the output gap.

OBR 2011b. Economic and Fiscal Outlook.

OECD 2009. Beyond the Crisis: Medium-term challenges relating to potential output, unemployment and fiscal positions. *OECD Economic Outlook 85, Chapter 4*.

OECD 2011. OECD Economic Surveys: United Kingdom.

ORPHANIDES, A. & VAN NORDEN, S. 2002. The unreliability of output-gap estimates in real time. *Review of Economics and Statistics,* 84**,** 569-583.

OVERMAN, H. 2010. Urban Renewal and Regional Growth: Muddled Objectives and Mixed Progress. *CEP Election Analysis*.

PERRON, P. 1989. The great crash, the oil price shock, and the unit root hypothesis. *Econometrica,* 57**,** 1361-1401.

PESSOA, J. & VAN REENEN, J. 2011. The Decoupling of Wages and Productivity: Myth and Reality. *LSE mimeo*.

POLLITT, M. G. 2009. Does Electricity (and Heat) Network Regulation have anything to learn from Fixed Line Telecoms? *Cambridge Working Papers in Economics, University of Cambridge,* 0925.

PORTES, J. 2011. The Coalition's Confidence Trick. *The New Statesman*.

POSEN, A. 2010. The UK inflation outlook if this time isn't different. *speech given at the Chairman's Annual Christmas Breakfast, Essex Institute of Directors, December*.

PROPPER, C., BURGESS, S. & GOSSAGE, D. 2008. Competition and quality: Evidence from the NHS internal market 1991-9. *Economic Journal,* 118**,** 138-170.

PROPPER, C. & VAN REENEN, J. 2010. Can Pay Regulation Kill? Panel Data Evidence on the Effect of Labor Markets on Hospital Performance. *Journal of Political Economy,* 118**,** 222-273.

RAJAN, R. G. 2010. *Fault Lines: How Hidden Fractures Still Threaten the World Economy*, Princeton University Press.

REINHART, C. M. & ROGOFF, K. S. 2009. The Aftermath of Financial Crises. *NBER Working Paper No. 14656*.

RODRIK, D. 2007. Normalising Industrial Policy. *Harvard University*.

SADUN, R. 2008. Does Planning Regulation Protect Independent Retailers? *CEP Discussion Papers Working Paper Series, No. dp0888*.

SIANESI, B. & VAN REENEN, J. 2003. The returns to education: Macroeconomics. *Journal of Economic Surveys,* 17**,** 157-200.

STEEDMAN, H. 2010. The State of Apprenticeships. *CentrePiece,* Autumn 2010.

STRATTON, A. 2011. Jobs rebranded as apprenticeships, government report warns. *The Guardian,* 27 October.

SYMEONIDIS, G. 2000. Price competition and market structure: The impact of cartel policy on concentration in the UK. *Journal of Industrial Economics,* 48**,** 1-26.

TIMMER, M. P. 2007. EU KLEMS growth and productivity accounts: an overview *National Institute economic review* 200**,** 64.

TIMMER, M. P., INKLAAR, R., O'MAHONY, M. & VAN ARK, B. 2010. *Economic Growth in Europe: A Comparative Industry Perspective,* United Kingdom, Cambridge University Press.

TURNER, A., HALDANE, A., WOOLLEY, P., WADHWANI, S., GOODHART, C., SMITHERS, A., LARGE, A., KAY, J., WOLF, M., BOONE, P., JOHNSON, S. & LAYARD, R. 2010. The Future of Finance: the LSE report.

VALERO, A. & VAN REENEN, J. 2011. *Slow growth does not have to be our 'new normal'. Government needs to change the way it looks at the growth problem in the long term* [Online]. Available: http://blogs.lse.ac.uk/politicsandpolicy/2011/08/02/slow-growth-not-new-normal/ [Accessed].

VAN ARK, B. 2010. Productivity, Sources of Growth and Potential Output in the Euro Area and the United States. *CEPS Intereconomics*.

VAN REENEN, J. 1997. Why has Britain had slower R&D growth? *Research Policy,* 26**,** 493-507.

VICKERS, J. 2011. Final Report: Recommendations. *Independent Commission on Banking*.

WADSWORTH, J. 2010. Immigration and the UK Labour Market: The Evidence from Economic Research. *CEP Election Analysis*.

WEALE, M. 2009. Commentary: Growth Prospects and Financial Services. *National Institute Economic Review,* 207.

WEALE, M. 2010. After the recession: Thoughts on the growth potential of the United Kingdom. *National Institute Economic Review,* 207.

WOLF, M. 2011. Britain must escape its longest depression. *Financial Times*.

Appendices

Appendix 1: Details of Decompositions of UK Macro-Economic Performance

Figure 1-3 graphically displayed UK performance and this appendix contains the key numbers underlying these graphs. Table A.1 summarises the two decompositions of GDP per capita for the UK and comparator countries: US, Germany and France in the pre and post-1997 periods[48]. The UK had a GDP per capita growth rate of 1.36 percentage points per year after 1997 (see Table 1). This is broken down into a 1.31% contribution from GDP per worker and 0.05% contribution from labour per capita (Panel A). In hours terms the 1.36% is broken down into GDP per hour growth of 1.69% and hours per capita growth of -0.32% in Panel B. This indicates that although the employment rate was broadly stable, hours worked per worker have declined. Looking down column (2) we can see that on both the per worker and per hour basis, productivity growth was faster in the US than the UK, but labour market performance (column (3)) was stronger in the UK than the US (which underperformed relative to Europe over this period).

Columns (4)-(6) compare these to the 1979-1997 ("Conservative") period and the last three columns gives the differences. In Panel A we see that per capita GDP growth was stronger under the Conservatives by 0.66% (column (7)) and this was driven by faster productivity growth (over a percentage point higher: 1.97% compared to 1.31%). The growth in the employment rate was the same (0.05%). For GDP per hour in Panel B we see that both productivity and hours per worker were lower under Labour, by 0.36% and 0.30% respectively.

It is noticeable that all the countries did worse in the post 1997 period however, as column (7) shows negative numbers for the US and France too. This suggests that there were global macro-economic shocks which made things harder everywhere (especially the Great Recession).

Table A.2 tries to account for these worldwide trends in a "difference in difference" framework by looking at the UK's relative performance before and after Labour took power. If we consider the US as the "control" country then we see that the per capita GDP grew faster in the UK in the Labour period by 0.42% p.a. But it also grew faster than the US in the Conservative period by 0.13% per annum. The improvement under Labour in this "difference in difference" estimate was 0.29% (=0.42%-0.13%). So this suggests that compared to the US which is the usual benchmark, the UK accelerated the "catch up" process post 1997. However, Table A.2 also shows that if France was the control group for the UK, then the improvement slowed down under Labour. Under the Conservatives the UK grew 0.74% faster than France, but under Labour it only grew 0.46% than France: a difference in difference of 0.28%. The pattern is even more complex when we look at the decompositions. The difference in difference shows that the UK's improvement over the US was a labour market phenomenon with the growth of the British employment rate much better than America's (productivity catch up was actually better under the Conservative's). The opposite is true for France. Although in terms of overall GDP per capita catch-up with France Labour fared worse the Conservatives, Labour's productivity catch-up was faster than it was pre-1979.

There is no right or wrong answer here as other countries have also been instituting policy reforms so there is no clean "placebo" group. The UK certainly improved relative to its main

[48] Growth rates for the Unified Germany are shown for the post-1997 period only as it was not possible to obtain a full and consistent time series of working age adults for the East and West Germany pre-1997.

peers since 1997 and in GDP per capita terms this seems to have sped up against the US and slowed down against France.

The Great Recession has had a major effect on the world economy and the UK in particular. We repeat Table A.1 and Table A.2 but stop the series in 2007 to show the importance of the crisis. The UK's absolute and relative performance looks generally stronger when we exclude the recession. In particular, in Table A4 the UK has had a relative improvement against France as well as the US when we end the series in 2007.

In this appendix we also include a longer term view of the UK's relative performance against its peers, to show that 1979 marked the end of its relative decline. Table A.5 shows real GDP per head for US, Germany and France relative to the UK (i.e. UK=100 in each year), taken from Crafts (2010). This shows that from 1979 the UK's decline relative to these three comparator countries began to reverse.

Table A.1: Growth rate in real GDP per capita (defined here as adult) and its components, including the Great Recession

	1997-2010			1979-1997			Change			1997 levels		
	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(1)-(4)	(8)=(2)-(5)	(9)=(3)-(6)			
Panel A: Labour input measured as number of workers												
UK	1.36	1.31	0.05	2.03	1.97	0.05	-0.66	-0.66	0.00	34,429	58,967	0.58
s.d	0.24	0.16	0.08	0.12	0.07	0.12	0.27	0.17	0.14			
US	0.95	1.84	-0.89	1.90	1.39	0.51	-0.96	0.45	-1.40	48,162	69,930	0.69
s.d	0.18	0.10	0.13	0.10	0.05	0.08	0.20	0.11	0.15			
Germany	0.93	0.73	0.20							33,855	62,172	0.54
s.d	0.13	0.12	0.09									
France	0.90	0.82	0.09	1.29	1.74	-0.45	-0.39	-0.92	0.54	34,378	65,273	0.53
s.d	0.15	0.08	0.10	0.07	0.05	0.04	0.16	0.09	0.11			
Panel B: Labour input measured as number of hours												
UK	1.36	1.69	-0.32	2.03	2.05	-0.02	-0.66	-0.36	-0.30	34,429	34	1,011
s.d	0.24	0.16	0.08	0.12	0.08	0.17	0.27	0.18	0.19			
US	0.95	2.09	-1.14	1.90	1.40	0.51	-0.96	0.69	-1.65	48,162	40	1,198
s.d	0.18	0.10	0.14	0.10	0.03	0.09	0.20	0.11	0.17			
Germany	0.93	1.26	-0.32							33,855	41	822
s.d	0.13	0.11	0.10									
France	0.90	1.24	-0.34	1.29	2.71	-1.42	-0.39	-1.47	1.09	34,378	41	835
s.d	0.15	0.15	0.07	0.07	0.12	0.10	0.16	0.20	0.13			

Notes: Analysis based on OECD data and US BLS for "working age adults". Coefficients (and standard errors) obtained from linear regression models to fit annual data from 1979 to 2010. Consistent series for a unified Germany are available from 1991 onwards. 1997 GDP is US$, constant prices, constant PPPs, OECD base year (2005). We note that the growth rates shown in column 1 do not correspond exactly to the GDP per adult in Table 1. This is because the growth rates reported here are calculated using a linear regression of the log of the series on a time trend and a constant. Table 1 reports cumulative annual growth rates which use the start and end year only.

Table A.2: Relative growth rates of GDP per capita (defined here as adult) pre post-1997, including the Great Recession

		Decomposition 1		Decomposition 2	
	Difference in growth rate of GDP per capita	GDP per worker	Employment per capita	GDP per hour	Hours per capita
	1	2	3	4	5
		A. 1979-1997			
UK - US	0.13	0.58	-0.45	0.65	-0.53
UK - France	0.74	0.24	0.50	-0.66	1.40
		B. 1997-2010			
UK - US	0.42	-0.53	0.95	-0.40	0.82
UK - France	0.46	0.50	-0.03	0.45	0.01
	C. Difference in growth rates: 1979-1997 compared to 1997-2010				
UK - US	0.29	-1.11	1.40	-1.05	1.34
UK - France	-0.28	0.26	-0.54	1.11	-1.39

Notes: Analysis based on OECD data and US BLS for "working age adults". Entries in column 1 represent the difference in the estimated trend growth rate in GDP per capita between the UK and the comparison country (from Table A.1), columns 2 and 3 represent the equivalent under decomposition 1, and columns 4 and 5 for decomposition 2. Germany is excluded from this analysis because consistent series for the unified Germany are available from 1991 onwards.

Table A.3: Growth rate in real GDP per capita (defined here as adult) and its components, excluding the Great Recession

	1997-2007			1979-1997			Change			1997 levels		
	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita	GDP per capita	GDP per labour input	Labour input per capita
	(1)	(2)	(3)	(4)	(5)	(6)	(7)=(1)-(4)	(8)=(2)-(5)	(9)=(3)-(6)			
Panel A: Labour input measured as number of workers												
UK	2.10	1.81	0.29	2.03	1.97	0.05	0.07	-0.16	0.24	34,429	58,967	0.58
s.d	0.09	0.05	0.04	0.12	0.07	0.12	0.15	0.09	0.12			
US	1.48	2.10	-0.62	1.90	1.39	0.51	-0.42	0.71	-1.13	48,162	69,930	0.69
s.d	0.12	0.09	0.12	0.10	0.05	0.08	0.15	0.10	0.14			
Germany	1.03	0.99	0.04							33,855	62,172	0.54
s.d	0.15	0.08	0.12									
France	1.31	1.04	0.26	1.29	1.74	-0.45	0.02	-0.70	0.71	34,378	65,273	0.53
s.d	0.12	0.06	0.13	0.07	0.05	0.04	0.14	0.08	0.14			
Panel B: Labour input measured as number of hours												
UK	2.10	2.21	-0.11	2.03	2.05	-0.02	0.07	0.16	-0.09	34,429	34	1,011
s.d	0.09	0.08	0.04	0.12	0.08	0.17	0.15	0.12	0.18			
US	1.48	2.34	-0.86	1.90	1.40	0.51	-0.42	0.95	-1.37	48,162	40	1,198
s.d	0.12	0.11	0.16	0.10	0.03	0.09	0.15	0.11	0.18			
Germany	1.03	1.58	-0.55							33,855	41	822
s.d	0.15	0.07	0.11									
France	1.31	1.73	-0.42	1.29	2.71	-1.42	0.02	-0.98	1.00	34,378	41	835
s.d	0.12	0.10	0.11	0.07	0.12	0.10	0.14	0.16	0.15			

Notes: Analysis based on OECD data and US BLS for "working age adults". Coefficients (and standard errors) obtained from linear regression models to fit annual data from 1979 to 2007. Consistent series for a unified Germany are available from 1991 onwards. 1997 GDP is US$, constant prices, constant PPPs, OECD base year (2005). We note that the growth rates shown in column 1 do not correspond exactly to the GDP per adult in Table 1. This is because the growth rates reported here are calculated using a linear regression of the log of the series on a time trend and a constant. Table 1 reports cumulative annual growth rates which use the start and end year only.

Table A.4: Relative growth rates of GDP Per Capita (defined here as adult) pre post-1997, excluding the Great Recession

		Decomposition 1		Decomposition 2	
	Difference in growth rate of GDP per capita	GDP per worker	Employment per capita	GDP per hour	Hours per capita
	1	2	3	4	5
		A. 1979-1997			
UK - US	0.13	0.58	-0.45	0.65	-0.53
UK - France	0.74	0.24	0.50	-0.66	1.40
		B. 1997-2007			
UK - US	0.62	-0.29	0.91	-0.13	0.75
UK - France	0.80	0.77	0.03	0.49	0.31
	C. Difference in growth rates: 1979-1997 compared to 1997-2007				
UK - US	0.49	-0.87	1.37	-0.78	1.28
UK - France	0.06	0.53	-0.48	1.15	-1.09

Notes: Analysis based on OECD data and US BLS for "working age adults". Entries in column 1 represent the difference in the estimated trend growth rate in GDP per capita between the UK and the comparison country (from Table A.3), columns 2 and 3 represent the equivalent under decomposition 1, and columns 4 and 5 for decomposition 2. Germany is excluded from this analysis because consistent series for the unified Germany are available from 1991 onwards.

Table A.5: Real GDP per capita (UK=100 in each year)

	USA	West Germany	France
1870	76.6	57.6	58.8
1913	107.8	74.1	70.8
1929	125.3	73.6	85.6
1937	103.4	75.4	72.2
1950	137.7	61.7	74.7
1979	142.7	115.9	111.1
2007	132.6	98.6	94.3

Notes: Reproduced from Crafts (2010). Analysis based on data sourced from Angus Maddison historical database and West Germany in 2007 calculated from Statistiches Bundesamt Deutschland 2010. Note that estimates refer to Germany from 1870 to 1937.

Appendix 2: Detailed Sector Growth Accounting

Table A.6: Growth accounting by sector, UK, annual average growth rates in percentage points

		VA contribution from		Labour productivity contributions from				Labour productivity contribution from knowledge economy
	Growth rate of VA	Hours worked	Labour productivity	Labour composition	ICT capital per hour	Non ICT capital per hour	TFP	
	1 = 2 + 3	2	3 = 4 + 5 + 6 + 7	4	5	6	7	4 + 5 + 7
1979-1997								
Total Industries	**2.1**	**-0.1**	**2.2**	**0.2**	**0.5**	**0.7**	**0.7**	**1.5**
Market economy	***2.3***	***-0.4***	***2.7***	***0.3***	***0.6***	***0.7***	***1.1***	***2.0***
Electrical machinery, post and communication	4.7	-1.0	5.7	0.3	1.7	0.5	3.2	5.2
Manufacturing excluding electrical	0.3	-2.0	2.3	0.2	0.4	0.1	1.6	2.2
Other goods producing industries	1.8	-1.3	3.1	0.3	0.2	1.1	1.5	2.0
Distribution services	2.5	0.0	2.4	0.1	0.6	0.4	1.3	2.0
Financial intermediation	3.3	1.0	2.3	0.3	1.2	1.3	-0.5	1.0
Business services and renting of m&eq	5.5	2.9	2.6	0.8	1.3	1.1	-0.6	1.5
Personal and social services	2.7	1.3	1.5	0.6	0.4	1.0	-0.6	0.4
Non market economy	***1.3***	***0.5***	***0.8***	***0.5***	***0.2***	***0.6***	***-0.6***	***0.2***
Public admin, education and health	0.9	0.3	0.6	0.6	0.3	0.2	-0.5	0.4
Real estate activities	2.5	1.1	1.4	0.3	0.1	2.2	-1.2	-0.8
1997-2007								
Total Industries	**2.7**	**0.6**	**2.0**	**0.4**	**0.7**	**0.6**	**0.4**	**1.5**
Market economy	***3.2***	***0.4***	***2.8***	***0.5***	***0.8***	***0.5***	***1.0***	***2.3***
Electrical machinery, post and communication	6.0	-1.2	7.2	0.5	2.1	0.0	4.6	7.2
Manufacturing excluding electrical	0.3	-2.2	2.6	0.6	0.4	-0.1	1.7	2.7
Other goods producing industries	0.7	0.3	0.4	0.1	0.2	0.5	-0.4	-0.1
Distribution services	3.4	0.5	3.0	0.4	0.7	0.8	1.1	2.2
Financial intermediation	5.1	0.8	4.3	0.9	1.5	0.0	1.9	4.3
Business services and renting of m&eq	6.9	2.6	4.3	0.5	1.5	1.0	1.3	3.3
Personal and social services	2.0	1.8	0.2	0.5	0.3	0.8	-1.4	-0.6
Non market economy	***1.2***	***1.2***	***0.0***	***0.4***	***0.2***	***0.9***	***-1.5***	***-0.9***
Public admin, education and health	1.5	1.5	0.0	0.6	0.2	0.1	-0.9	-0.1
Real estate activities	0.6	0.5	0.1	0.1	0.1	2.6	-2.8	-2.5

Table A.7: Growth accounting by sector, US, annual average growth rates in percentage points

		VA contribution from		Labour productivity contributions from				Labour productivity contribution from knowledge economy
	Growth rate of VA	Hours worked	Labour productivity	Labour composition	ICT capital per hour	Non ICT capital per hour	TFP	
	1 = 2 + 3	2	3 = 4 + 5 + 6 + 7	4	5	6	7	4 + 5 + 7
1979-1997								
Total Industries	**2.7**	**1.0**	**1.7**	**0.2**	**0.6**	**0.9**	**0.0**	**0.8**
Market economy	***3.2***	***0.9***	***2.2***	***0.2***	***0.8***	***0.7***	***0.4***	***1.5***
Electrical machinery, post and communication	6.6	0.6	6.0	0.3	1.2	0.8	3.8	5.3
Manufacturing excluding electrical	1.3	-0.3	1.6	0.3	0.5	0.4	0.3	1.2
Other goods producing industries	1.8	0.5	1.3	0.2	0.3	0.5	0.3	0.8
Distribution services	3.9	0.9	3.0	0.2	0.6	0.6	1.6	2.4
Financial intermediation	3.2	1.2	2.0	0.2	2.4	2.2	-2.9	-0.2
Business services and renting of m&eq	5.3	3.9	1.4	0.1	1.7	0.7	-1.1	0.7
Personal and social services	2.8	1.7	1.0	0.1	0.2	0.5	0.2	0.5
Non market economy	***1.8***	***1.0***	***0.8***	***0.2***	***0.2***	***1.4***	***-1.0***	***-0.6***
Public admin, education and health	1.4	1.5	-0.1	0.3	0.3	0.6	-1.4	-0.8
Real estate activities	2.6	0.1	2.5	0.0	0.0	2.7	-0.2	-0.2
1997-2007								
Total Industries	**3.0**	**0.7**	**2.3**	**0.2**	**0.7**	**0.7**	**0.6**	**1.6**
Market economy	***3.4***	***0.5***	***2.9***	***0.3***	***0.9***	***0.5***	***1.2***	***2.5***
Electrical machinery, post and communication	8.2	-1.2	9.4	0.3	1.4	0.5	7.2	8.9
Manufacturing excluding electrical	1.1	-1.3	2.4	0.2	0.5	0.1	1.5	2.3
Other goods producing industries	0.3	1.1	-0.8	0.0	0.4	0.7	-1.9	-1.5
Distribution services	4.2	0.4	3.8	0.3	0.7	0.4	2.4	3.4
Financial intermediation	4.5	0.8	3.8	0.4	1.7	0.8	0.9	3.0
Business services and renting of m&eq	4.8	2.2	2.6	0.4	1.8	0.7	-0.4	1.8
Personal and social services	3.2	1.2	1.9	0.3	0.2	0.5	1.0	1.5
Non market economy	***2.1***	***0.9***	***1.1***	***0.2***	***0.3***	***1.3***	***-0.6***	***-0.2***
Public admin, education and health	1.7	1.4	0.3	0.3	0.4	0.5	-0.9	-0.2
Real estate activities	2.7	0.1	2.6	0.0	0.1	2.6	-0.2	-0.1

Notes: Analysis based on EU KLEMS data.

Appendix 3: Sector Contributions to Market Economy Labour Productivity Growth

Table A.8: Calculations underlying the sector contributions to market economy labour productivity growth (share in nominal GVA weightings)

	UK			EU			US			France		
	Labour productivity contribution	Average share of ME GVA	Weighted contribitions	Labour productivity contribution	Average share of ME GVA	Weighted contribitions	Labour productivity contribution	Average share of ME GVA	Weighted contribitions	Labour productivity contribution	Average share of ME GVA	Weighted contribitions
1979-1996												
Electrical machinery, post and communication	5.69	7%	0.41	4.56	7%	0.33	6.04	9%	0.54	4.12	6%	0.27
Manufacturing excluding electrical	2.31	26%	0.61	2.54	27%	0.69	1.59	24%	0.38	2.60	23%	0.60
Other goods producing industries	3.08	20%	0.62	2.41	18%	0.45	1.30	15%	0.20	2.92	19%	0.54
Distribution services	2.45	21%	0.51	2.44	21%	0.51	2.97	23%	0.68	3.19	21%	0.68
Financial intermediation	2.32	8%	0.18	1.95	8%	0.15	1.99	9%	0.19	1.38	7%	0.10
Business services and renting of m&eq	2.61	10%	0.25	1.39	11%	0.15	1.41	12%	0.16	0.33	15%	0.05
Personal and social services	1.47	8%	0.12	0.06	8%	0.00	1.02	8%	0.08	-0.11	8%	-0.01
Reallocation			-0.03			0.00			-0.02			-0.01
Market economy	**2.67**	**100%**	**2.67**	**2.28**	**100%**	**2.28**	**2.22**	**100%**	**2.22**	**2.24**	**100%**	**2.24**
1997-2007												
Electrical machinery, post and communication	7.24	6%	0.47	6.27	7%	0.44	9.41	8%	0.74	7.25	6%	0.42
Manufacturing excluding electrical	2.57	19%	0.48	2.03	24%	0.48	2.36	19%	0.45	2.67	20%	0.52
Other goods producing industries	0.43	15%	0.06	0.83	15%	0.13	-0.81	14%	-0.11	1.23	15%	0.19
Distribution services	2.96	22%	0.67	2.12	21%	0.45	3.76	22%	0.82	2.28	23%	0.51
Financial intermediation	4.32	9%	0.37	3.16	8%	0.25	3.75	12%	0.47	2.90	7%	0.21
Business services and renting of m&eq	4.26	18%	0.77	1.40	16%	0.22	2.56	16%	0.41	0.77	20%	0.16
Personal and social services	0.23	11%	0.02	0.18	9%	0.02	1.94	9%	0.18	1.51	9%	0.14
Reallocation			-0.05			0.00			-0.01			0.03
Market economy	**2.79**	**100%**	**2.79**	**1.98**	**100%**	**1.98**	**2.94**	**100%**	**2.94**	**2.18**	**100%**	**2.18**

Notes: Analysis based on EU KLEMS data. The "labour productivity contribution" of a sector is the annual average growth of real gross value added in the sector. The "average share of ME GVA" is the share of the sector in nominal gross value added averaged over the relevant time period. The "weighted contribution" to aggregate market economy productivity (the annual average growth in real gross value added per hour) is the product of "labour productivity contribution" multiplied by "average share of ME GVA".

Appendix 4: Output Gap Methodologies of the Relevant International Institutions

Office for Budget Responsibility (OBR)

Summary from OBR (2011a). Most recent published estimates from OBR (2011b).

OBR estimates the "output gap" for purposes of economic and fiscal forecasting, and carrying out assessments on whether the government is on course to achieve its medium term fiscal targets. The last estimate (published March 2011) used data from 2007Q1 to 2010Q3.

Two approaches are used to combine the cyclical indicators, which are standardised prior to estimation so that they are all expressed in comparable units of measurement:

- *Aggregate composites method*: Weighted average of survey indicators of capacity utilisation and recruitment difficulties. The weights on each indicator are based on factor income shares and sector shares.

  The following raw (unstandardized) series is constructed:

  $$Y = \alpha.R + (1 - \alpha).C$$

  Where:

  α = labour share of income (total employee compensation / gross value added)

  R= aggregated average measure of recruitment difficulties (average of BoE Agent Scores recruitment difficulties indicator and combination of BCC and CBI indicators)

  C=aggregated average measure of capacity utilisation – the weighted average of capacity utilisation in manufacturing (from BCC, BCI and BoE) and services (BCC and BoE)

- *Principal components method*: Identification of the common determinant of a set of cyclical indicators, with weights ("loadings") being assigned according to the underlying properties of the dataset. The PCA is carried out using STATA or E-Views using all variables in standardised form.

  The combination of variables based on these weights can then be used to construct the raw series:

  $$X = \sum_{i=1n} \varphi_i Z_i$$

  Where:

  Z_i= standardised cyclical indicator i

  φ_i= the factor loading corresponding to indicator i

  The indicator variables include the unemployment gap (ONS, OECD), earnings growth (ONS), a number of recruitment difficulties indicators (BCC, CBI), the percentage of financial services firms with levels of business above normal (CBI/PwC), capacity utilisation statistics (CBI), wages or compensation/GVA (OBR, ONS), and change in unit wage costs (OBR, ONS). All variables are standardised using data from 1995Q1-2010Q3.

The raw series Y and X are then transformed to an appropriate output gap scale. Each series is standardised using its mean and standard deviation since 1995Q1, and then scaled to the mean and standard deviation of the OECD's historical output gap series[49].

A further step is applied to the PCA series X. This estimate tends to be relatively volatile (due to the fact the PCA finds combinations of variables with the greatest variance). Therefore, a 3 quarter moving average is applied to the series to adjust for the volatility.

OECD

Summary from Beffy et al (2006), and revisions in OECD (2009). Most recent published estimates from OECD (2011).

The OECD publishes output gap estimates in the context of its annual June and December Economic Outlook. Its output gap measure is expressed as the difference between actual and estimated potential GDP, in volume terms and in per cent of potential GDP.

A production function approach is used, with the exact specification varying across countries depending on data availability. For most countries potential output is estimated using data on capital services, total factor productivity and potential employment which in part depends on estimates of the structural rate of unemployment (NAIRU). It should be stressed that the estimated levels of potential output are subject to significant margins of error.

The underlying approach is a two factor (capital and labour) Constant Returns to Scale Cobb-Douglas production function which is subject to labour augmenting technical progress. Over time, this framework has been enriched in a number of ways, for example to correct labour inputs for hours worked and to incorporate measures of the underlying structural rates of unemployment (NAIRU) based on a model of inflationary pressures. Originally the estimates were for the the business sector but more recently (due mainly to data issues; in particular the use of chain linking makes it harder to estimate business sector variables, especially on a comparable cross country basis) a total economy approach has been used.

$$GDPV = (ELEFF * ET * HRS)^{\alpha}(KTV)^{1-\alpha}$$

Where:

$GDPV$= real GDP

$ELEFF$= TFP, computed as a residual

ET= total employment

HRS= hours worked per employee

KTV= whole economy capital stock

α= labour's share of income

Defining the working age population as $POPT$, the participation rate as $LFPR$ and unemployment rate as UNR, ET can be rewritten as $POPT * LFPR * (1 - UNR)$. So that we now have:

$$GDPV = (ELEFF * POPT * LFPR * (1 - UNR) * HRS)^{\alpha}(KTV)^{1-\alpha}$$

The computation of potential output is based on the following steps and assumptions:

[49] Definition of OECD output gap: percentage difference between actual GDP in constant prices, and estimated potential GDP. The latter is estimated using a production function approach with the exact specification varying across countries depending on data availability.

- TFP is obtained from solving out the first expression
- TFP, hours and the participation rate are then de-trended using an HP filter
- The NAIRU is based on the Kalman filter estimation approach

Finally, potential output is given by our expanded expression using filtered variables as inputs into the production function.

Capital stock is obtained from the following identity over a short term horizon:

$$KTV = ITV + (1 - rscr) * KTV_{-1}$$

Where ITV represents the whole economy investment and $rscr$ the scrapping rate.

Capital services (or productive capital) are used as the capital input into the production function. The OECD states that capital services are preferable to traditional measures of capital stock for two reasons: firstly, it takes better account of age-efficiency and retirement profiles of specific asset groups and incorporates a more satisfactory weighting scheme based on the marginal productivity of different assets, both of which are particularly important during periods of rapidly changing technologies. Secondly, capital services provide more transparency because the measure is derived according to a unified and identifiable method specifically designed to be comparable across countries.

Capital services are typically estimated in index form and need to be benchmarked to a given year. Benchmark measures of total economy capital stocks are used to arbitrarily rescale capital services measures.

Until 2009, capital services measures were smoothed (using an HP filter) when estimating the potential level. Since 2009, however, it has been considered that the actual series should be used. The reasoning for this was that the financial crisis has severely affected investment and growth in capital stock in most countries, and it is difficult to assess the longer term consequences and hence the implications for smoothed capital services. These changes therefore imply greater variability in capital and hence potential growth, and a bigger hit to potential output during the crisis.

The second key change relates to NAIRU. Following the shock to labour markets of the crisis, and because of hysteresis type effects in some countries, NAIRUs have been revised upwards.

IMF

Summary from World Economic Outlook (IMF, 2010). Most recent published estimates World Economic Outlook (IMF, 2011).

The IMF uses its Global Projection Model (GPM), a non-linear, forward looking, multicounty model, which contains a block that computes estimates of potential output and the output gap.

The block is in the class of "unobserved components models" (because model splits observable output into two unobservable components: potential output and the output gap). GPM's estimates of potential output are conditioned on three variables, other than output itself:

- Unemployment, operating through Okun's law (an empirically observed relationship relating unemployment to losses in a country's production)
- Capacity utilisation. If output is depressed because of a negative demand shock, production falls more than capacity, opening spare capacity. But if the shock is to productivity, the desired capital stock would fall and capital investment would also fall, reducing capacity. Therefore, a small amount of spare capacity indicates a

negative supply shock. The model reads data on capacity utilisation and infers from prediction errors in this and other series whether utilisation has changed due to a demand shock or whether equilibrium capacity has changed.

- Inflation: if inflation is stable over time there must be neither excess demand nor excess supply, but influence of excess demand on inflation is weak, so inflation's role in estimating potential output in the GPM is a weak one.

NIESR (Barrell and Kirby)

Summary from Barrell and Kirby (2011) and discussion with Ray Barrell

The NIESR's preferred approach is the production function approach. A global model, the NiGEM, is used with an estimated and calibrated production function (see http://nimodel.niesr.ac.uk/logon/nigem.php?sw=0&t=3&b=2&tw=1 for more detail). Includes energy as well as labour and capital inputs. The elasticity of substitution between capital and labour is assumed to be half and the elasticity of substitution between other inputs and energy (oil, coal, gas) is one.

Up until 2007 NIESR had been using a Baxter King filter, but it became clear that the financial crisis would change trend output, and hence the filter would not be useful as it is less able to deal with sharp changes at the end of a sample period.

Trend output is produced by equilibrium capital, equilibrium labour input and the level of technical progress. Therefore it is necessary to understand what determines each of these, and also what impact has the financial crisis had on their sustainable levels. These issues were addressed in a number of papers, the first of which (Barrell and Kirby, 2008) was written in the summer before Lehman's collapsed.

Capital

By 2008, it was already clear that risk premia on investment decisions would be higher in the foreseeable future than for the last decade or so. Barrell and Kirby (2008) look at market based premia on BAA debts in the UK and elsewhere and judged that they had risen by perhaps 300 basis points. Bank borrowing costs had also risen, and it was assumed that they would stay higher for a sustained period. The rise in risk premia would raise the user cost of capital, with the impact depending on the effect of the crisis on the equity risk premium. It was estimated that the user cost would rise by 200 basis points from 12 per cent. Given that the evidence suggests that the UK operates with a CES production function with an elasticity of around a half (Barrell and Pain, 1997) it was judged the impact on the crisis on sustainable output through capital was to reduce it by 2 per cent or a bit more. The Lehman crisis raised this estimate somewhat, with a production function based scar of perhaps 3 per cent of GDP in total. The effect would feed in slowly as the capital output ratio has to adjust downward. Equilibrium output calculations for 2010 used actual capital.

Labour

Trend labour input (person hours) has to be based on an hours equation, a wage equation and an employment or labour demand equation (and hence a price mark-up). These give an output a measure of the NAIRU, but it is the trend input that matters. The trend is calculated using a Baxter King filter on total employment hours with the forecast included to avoid endpoint problems and also to take account of any assumed structural changes. This also ensures the filter does not follow actual input too closely in a downturn. It was judged (Barrell and Kirby, 2011) that the "scarring" from unemployment would raise the NAIRU by up to 1 per cent. It addition, it was initially judged that the recession would reduce migration, but it has not, so

by 2010 this was no longer accounted for. The combination of the scar to capital and to labour input left a permanent impact of 3 to 4 per cent from the crisis.

Participation rates can be judged from recent trends and also from changes in retirement legislation, which are discussed in Barrell and Kirby (2011).

TFP

This rests on research at various times. The work is discussed for instance in Barrell et al. (2011) which compares the UK to other countries up until 2007, and looks at the role of the financial sector. The view is that technical progress will be slightly slower in the future than in the recent past, partly because of a slight shrinking of finance, but also due to a degree of catching up with the US and West Germany in recent years. However, it was not expected that the crisis in and of itself would reduce the level of technical progress or its growth rate.

European Commission

Summary from Cotis et al. (2005) and European Economic Forecast (EC, 2011). Most recent estimates published in European Commission Autumn Forecast (http://ec.europa.eu/economy_finance/eu/forecasts/2010_autumn_forecast_en.htm)

The European Commission uses a production function approach, very similar to that used by the OECD, having previously used statistical filter methods. The principal differences with the OECD method are that EC estimates do not incorporate hours and a NAWRU rather than a NAIRU (non-accelerating wage rate of unemployment) is estimated (i.e. using information on wages rather than prices).