

# THE 2007 PRODUCTIVITY & COMPETITIVENESS INDICATORS



HM TREASURY **BERR** | Department for Business  
Enterprise & Regulatory Reform

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# THE 2007 PRODUCTIVITY & COMPETITIVENESS INDICATORS

This document sets out the latest progress update on the Government's productivity and competitiveness indicators. These indicators form part of the monitoring framework established to assess progress against the Government's long running Public Service Agreement (PSA) to

*'demonstrate progress by 2008 in raising UK productivity growth over the economic cycle, improving competitiveness and narrowing the productivity gap with the US, France and Germany.<sup>1</sup> In the current CSR, BERR were given lead responsibility for driving forward this PSA within Government'*

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The indicators are a key way of monitoring progress and also form an important element of the evidence base on productivity and competitiveness. Tracking the UK's progress on productivity is especially important in the context of the rapid technological, social and structural change associated with globalisation.

The indicators are organised by the five drivers of productivity:

- Investment;
- Innovation;
- Skills;
- Enterprise; and
- Competition.

The first set of indicators was developed by the former Department of Trade and Industry in 1999, and annual updates have been produced since 2001. Initially they provided a broad assessment of the UK's progress towards enhanced competitiveness, using a wide range of indicators. However, in March 2004, the Government reviewed the original set with the aim of identifying a more focussed suite of indicators that would track the productivity PSA target more closely. Following a public consultation, the Government published its assessment of the newly focussed indicators in November 2004. This document provides the fourth assessment of the new set of indicators, comparing the UK's performance to that of our main industrialised competitors: France, Germany and the US.

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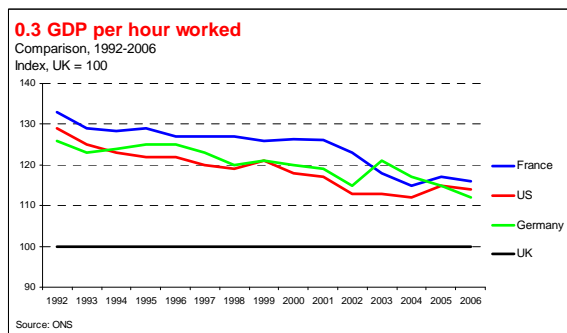
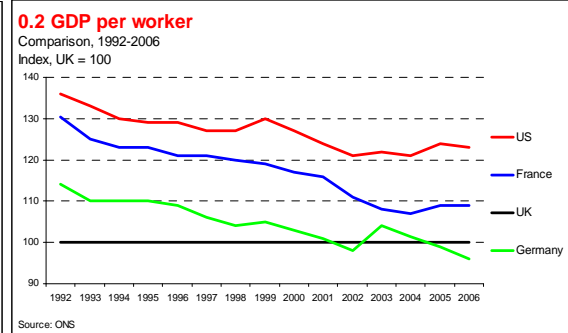
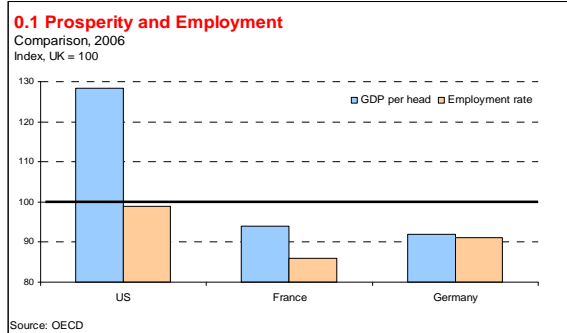
<sup>1</sup> 2004 Spending Review: New Public Spending Plans 2005-2008, HM Treasury, July 2004.

## EXECUTIVE SUMMARY

Driver	Assessment
Outcomes	The UK continues to make progress on improving prosperity (GDP per capita), through a mixture of a strong employment performance and productivity growth. Productivity growth appears to have increased relative to previous economic cycles and there has been clear progress in closing the productivity gaps with France, Germany since 1995. The UK is also the only G7 country to have kept pace with the US's impressive performance.
Investment	Continuing macroeconomic stability suggests the investment climate is relatively attractive. However, despite some improvement, investment by business and capital stock levels in the UK remain relatively low.
Innovation	UK's performance on innovation appears to be mixed. Despite having a strong science base, the UK appears to have low levels of R&D and patenting, although these can be partly explained by UK-specific factors such as industrial structure.
Skills	The UK is continuing to make progress on improving skills, particularly in terms of boosted higher-level skills. However, there still appears to be a relative weakness on intermediate and basic-level skills, and perceptions of UK management skills also appear to be worse than those of our main competitors.
Enterprise	In comparison to France and Germany, the UK performs well on the Enterprise driver. However, despite progress, a gap with the US still remains, and improvements could perhaps be made in further lowering the costs and time associated with starting up a business.
Competition	The UK performs well on the competition driver, with the increased powers to the competition authorities determined through provisions of the Competition Act (1998) and the Enterprise Act (2002) continuing to have a positive impact. Product market regulation is still considered to be relatively light touch and the UK is relatively open to competition in the form of international trade and investment.

# OUTCOMES

Output per head is a widely used measure of a country's prosperity<sup>2</sup>. The level of prosperity therefore is dependent on the total amount of output produced in the economy and the number of people that output has to support. Output, in turn, is determined by the amount of labour employed and the average amount produced by each worker – labour productivity –.



<sup>2</sup> This is the amount of output each individual receives if the country's total output is divided equally among its population

## Assessment

Chart 0.1: Prosperity and Employment, shows prosperity in the UK (as measured by output per worker) is substantially lower than in the US, but higher than in France or Germany. The UK's employment rate (also shown in Chart 0.1) is above that in France Germany or the US. The UK's sustained strong employment performance and the current tightness of the labour market suggests that future increases in output per head will have to come about through productivity improvements rather than through increased labour utilisation.

The UK has a long-standing productivity gap with its main competitors. However, as detailed in chart 0.2, there has been progress in narrowing the output per worker gap. On this measure the UK is now ahead of Germany, the gap with France has halved since 1997 (from 21 to 9 index points), and the UK has kept pace with the US (the gap narrowing from 27 to 23 index points since 1997).

Performance has been similarly marked on an output per hour worked, as shown in chart 0.3. The gap with France narrowed from 30% to 19% between 1995 and 2005. Over the same period, the gap with Germany narrowed from 26% to 15%. There was also a marginal narrowing of the gap with the US over this period.<sup>3</sup>

There are also clear signs that the UK is making progress towards improving its productivity performance over the economic cycle. According to latest HMT estimates in the Pre Budget report 2007<sup>4</sup> trend productivity growth (per hour worked) is estimated to have grown by 2.70% per annum over the first half of the current economic cycle (1997H1 and 2001Q3), compared with 1.95% per annum over the last economic cycle (1986Q1 to 1997H1).<sup>5</sup>

Progress has been made in improving the productivity performance of the UK, but further work is required. The recent HMT and BERR publication *Productivity in the UK 7: Securing long-term prosperity*<sup>6</sup> sets out five levers that Government can use to make the most difference to the UK's productivity performance and effectively respond to long-term challenges such as an ageing population, globalisation and climate change and technological progress. These levers are investment in workforce and skills,

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<sup>3</sup> The French national statistics agency (INSEE) recently made a substantial revision to its hours worked data, leading a downward shift in their output per hours worked measure. The revisions are for the whole time series of data and so do not significantly affect the trend – however it does mean that the gap to the French is not as large as previously thought.

<sup>4</sup> <http://pbrcsr07.treasury.gov.uk/>

<sup>5</sup> Budget Report 2007, HMT

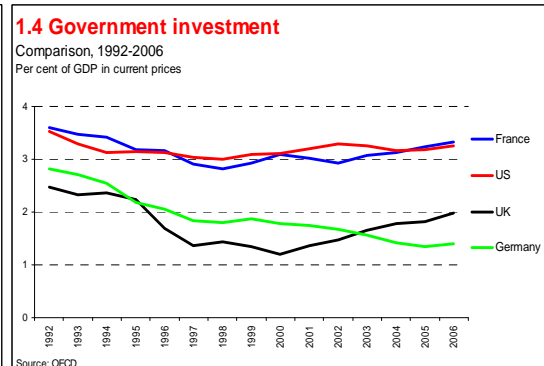
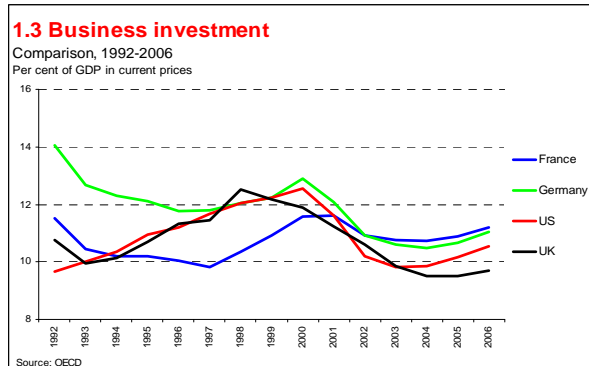
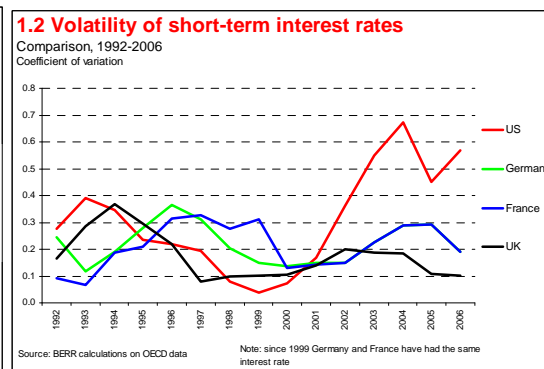
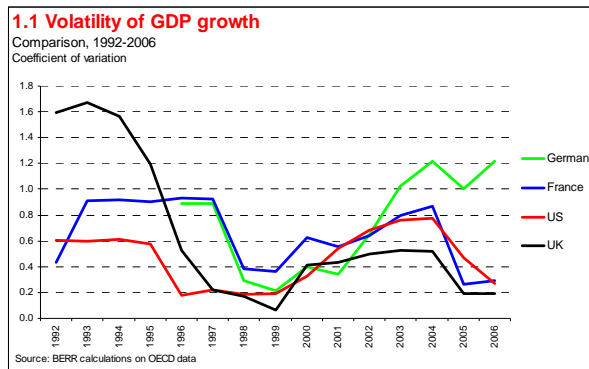
<sup>6</sup> <http://www.hm-treasury.gov.uk/media/4/0/productivityintheuk7141207.pdf>

investment in infrastructure, tax and regulation simplification, competition and market frameworks and public sector efficiency.

The rest of this paper provides an update on the how the UK is performing under each of the five drivers of productivity, identifying areas of strength and areas for further improvement in performance

# INVESTMENT

Investment expands the physical capacity of the economy and hence allows economic growth to take place. In order for investment to occur, there must be some expectation of profitable opportunities in the future that can be exploited. Investment will therefore be influenced by the macroeconomic climate, and the availability of technological and growth opportunities. Under the five-driver framework, investment covers both business and Government and includes putting resources into physical capital, ICT, infrastructure or public sector capital.



## Assessment

The UK has a relatively stable macroeconomic climate. Charts 1.1 and 1.2<sup>7</sup> show that the UK has had lower variability of GDP growth and interest rates than the US, France and Germany in the last few years. Volatility of GDP growth (Chart 1.1) has dropped in the UK, France and the US over the past year, and the UK continues to outperform its rivals on this measure. The same is true with respect to interest rates (Chart 1.2), where the UK has consistently had the lowest rates of volatility since 2003.

However, the relative macroeconomic stability of the UK (and hence the reduction of risk associated with investment decisions) has not yet translated into increased investment performance. Chart 1.3 shows that UK business investment as a proportion of GDP has on average been lower than in the US, France and Germany since 2000. Business investment has a direct impact on the amount of capital and technology available to each work employed, affecting their productivity. The downward trend since 1998, stabilised in the UK in 2005, and the UK France, Germany and the US have all experienced slight increases over the last year<sup>8</sup>.

Chart 1.4 shows that UK government investment as a proportion of GDP has been growing since 2000, and is no longer the lowest of the four countries, having overtaken Germany in 2003. Government investment covers a number of different contributions to the economy's capital stock, in particular infrastructure and the provisions of public services. The rate of growth of government investment in the UK has also been rising faster than comparator countries.

Comparatively low levels of business and government investment have implications for the UK's labour productivity. However, some of the UK's poor investment performance relative to France and Germany might be explained by the UK's more flexible labour markets, which reduce the cost of labour relative to capital, suggesting greater incentives for UK firms to employ labour instead of capital.

In summary, , despite the UK having experienced some improvements, in investment by business and capital stock levels more needs to be done in order to be in line with comparator countries. However, the continuing macroeconomic stability experienced in the UK over the last decade is a sign that the investment climate is relatively attractive.

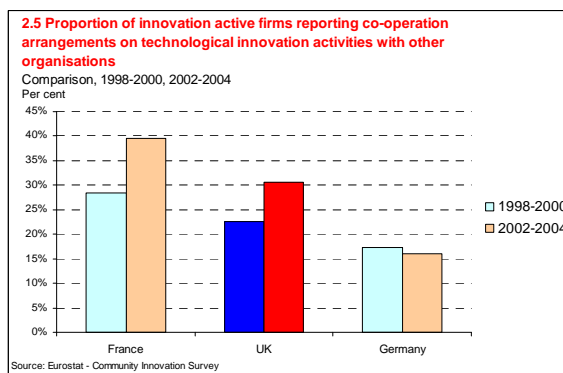
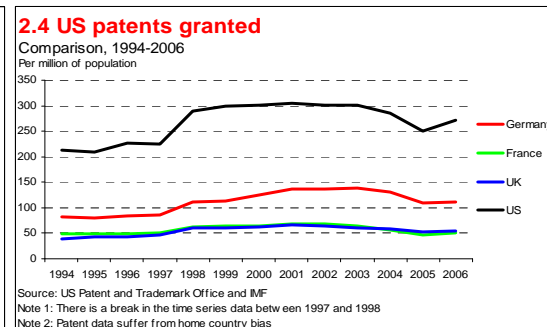
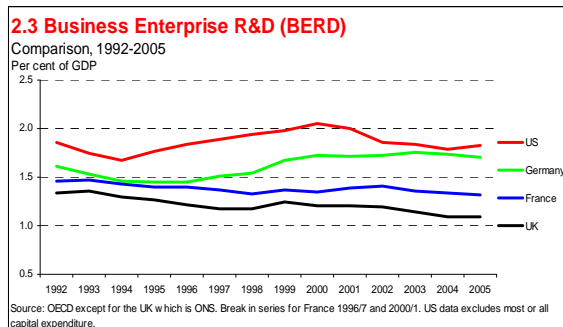
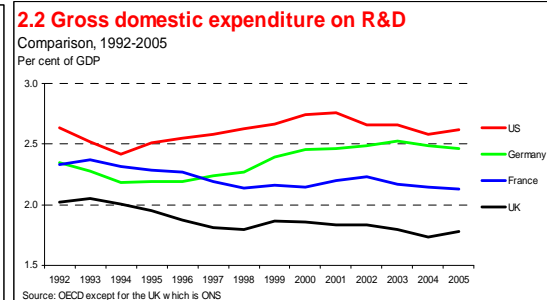
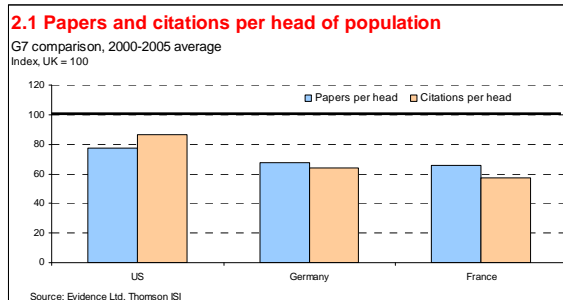
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<sup>7</sup> Charts 1.1 and 1.2 report the coefficient of variation, which is the standard deviation expressed as a proportion of the mean. Under this measure, a 2 per cent standard deviation from an 8 per cent mean growth rate would be seen as a lower level of variation than a 2 per cent standard deviation from a 4 per cent growth rate.

<sup>8</sup> Annual changes should be interpreted with caution as annual figures are subject to statistical error and exchange rate fluctuations.

# INNOVATION

Innovation drives productivity growth and economic growth in the long run. It comprises the development of new technologies, goods and services and intangibles such as new methods of working and improvements to services. The ability of UK businesses to compete with firms based in lower-cost economies will be dependent upon developing strong innovation processes.



## Assessment

The UK leads the US, France and Germany on both the number of academic papers produced per head and the number of citations of academic papers per head (Chart 2.1). Citations are held to be an indicator of quality; more often than not if a paper is cited it is because it is thought to be of value. This suggests that the UK has a strong and respected science base.

However, indicators on Gross and Business Expenditure on R&D (GERD and BERD shown in Charts 2.2 and 2.3 respectively) suggest that this strong knowledge base is not being transferred into business innovation. GERD and BERD data, which provide an indicator of the amount of resources an economy assigns to the generation of new knowledge, show that the UK has been consistently below levels of R&D expenditure in the US, France and Germany for many years. However, R&D intensity varies by industry and other types of innovation, such as organisational change, may be more important in some sectors. The industrial composition of the UK economy (which involves relatively less R&D-intensive industry) appears to explain part of the UK's low R&D performance.<sup>9</sup>

The number of patents granted is commonly used to provide an indication of the level of innovation output in an economy (Chart 2.4). Unsurprisingly, UK firms are granted relatively fewer patents in the US than US firms<sup>10</sup>. However, German firms are granted a substantially greater number than the UK, suggesting that the UK has a lower innovation output than Germany<sup>11</sup>. Over the last year, UK firms have performed similarly to French firms, relative to their respective populations.

Cooperative innovation arrangements between firms (which are considered be beneficial through spreading risk and pooling financial resources and knowledge, Chart 2.5) and proportion of firms' output accounted for by new or improved products (Chart 2.6) contribute to the overall picture of how the UK is performing on innovation. On the former, the proportion of firms reporting cooperation agreements in the UK has risen. Nevertheless the UK still has a lower proportion than France, and a much higher proportion than Germany although the difference in the proportion of innovative activity in the UK has grown considerably with respect to Germany.. On the latter, the proportion of turnover due to new or significantly improved products has

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<sup>9</sup> See DTI Economics Paper No. 11 *R&D-intensive businesses in the UK*,

<sup>10</sup> There is an inherent home country bias in patent statistics.

<sup>11</sup> These differences may in part be due to such factors as the number of British and German firms established in the US and relative trade volumes, and as such should not be taken as an absolute measure of performance on innovation.

fallen in all three countries (although only marginally for France), with the UK maintaining its middle ranking between its European competitors.<sup>12</sup>

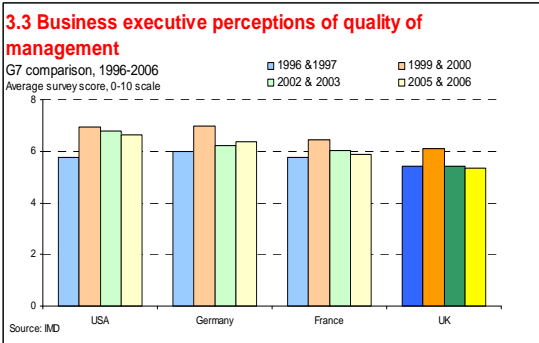
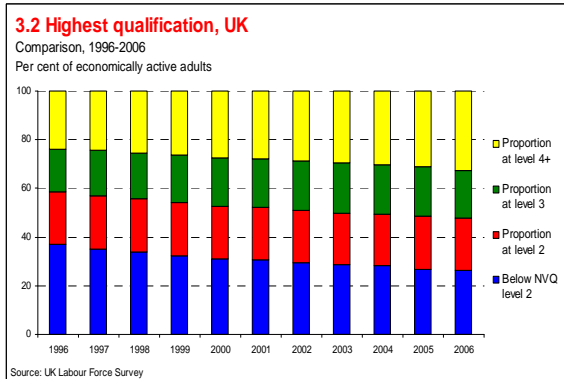
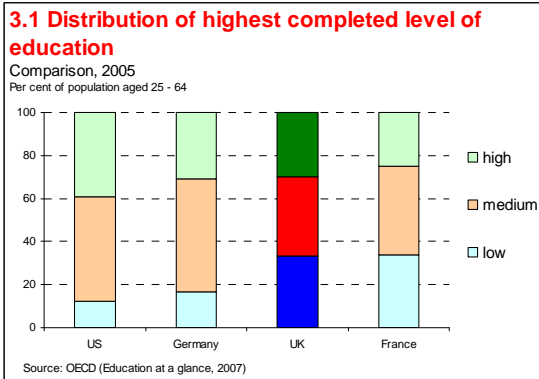
Overall, the UK has a mixed performance on innovation. Despite having a strong science base, the UK appears to have low levels of R&D and patenting (although these can be partly explained by UK-specific factors).

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<sup>12</sup> Comparisons can be made with the 2001 UK Innovation Survey, which measured innovation over the period 1998-2000. Sectoral coverage of the 2005 Survey widened considerably to include a larger portion of the service sector (now includes Sale, Maintenance and Repair of Motor Vehicles, Retail Trade, Hotels and Restaurants).

# SKILLS

Workers with higher skill levels contribute to higher productivity levels through better ability to utilise capital, greater capacity to innovate and greater ability to adapt to changes in the economic environment including adopting new business practices. Development of skills can be promoted through a number of routes including on-the-job training, such as ICT and managerial skills, as well as more formal educational qualifications. Skills are complementary to innovation and technology. Investment in innovation and technology is far more profitable for firms when combined with skilled labour. Skilled workers are also better able to adapt to changing business environments and therefore provide flexibility in the economy. This is particularly important given the open nature of the UK economy and rapid globalisation



## Assessment

The skills profile of the UK has been gradually improving over the last decade. Chart 3.2 shows that the percentage of the UK's adult population that are economically active (employed and unemployed) and that have skills below Level 2 has been declining steadily since 1996. In 1996 approximately 37% of the economically active has skills below level 2, now (2006) only 26% have skills below level 2.<sup>13</sup> The proportion at levels 2 and 3 appears to have remained relatively stable over recent years around 21% and 20% respectively. However, there does appear to have been progress in improving the proportion of economically active at Level 4 and above, with the proportion rising to almost 33% from 24% ten years ago.

Although the UK's skills profile does appear to be improving, progress is still required on improving the UK's relatively position, particularly with respect to the US and Germany (Chart 3.1). OECD analysis of levels of educational attainment show that the UK has a higher than average proportion of people with degrees, (including in science, engineering and technology), although this proportion is still behind that seen in the US and slightly behind Germany. The UK has a relatively low proportion of its population qualified at the intermediate level, below all three comparator countries and a relatively high proportion with low-level skills. On the latter, the UK is on a par with that of France, but with over twice the proportion seen in Germany and the US.

Assessing the quality of management is challenging due to the difficulties in measurement, particularly when making international comparisons. However, evidence that is available, suggests that management skills in the UK are perceived to be relatively poor. For example, Chart 3.3, shows results from an international survey by the Institute of Management Directors of business executives' perceptions of quality the results of this survey suggest that UK managers fall behind their French, German and American counterparts in terms of perceived competence and experience. A recent study by the CEP/McKinsey places the UK in the middle group when ranking countries by management standards, with performance dragged down by a long tail of poorly performing firms.

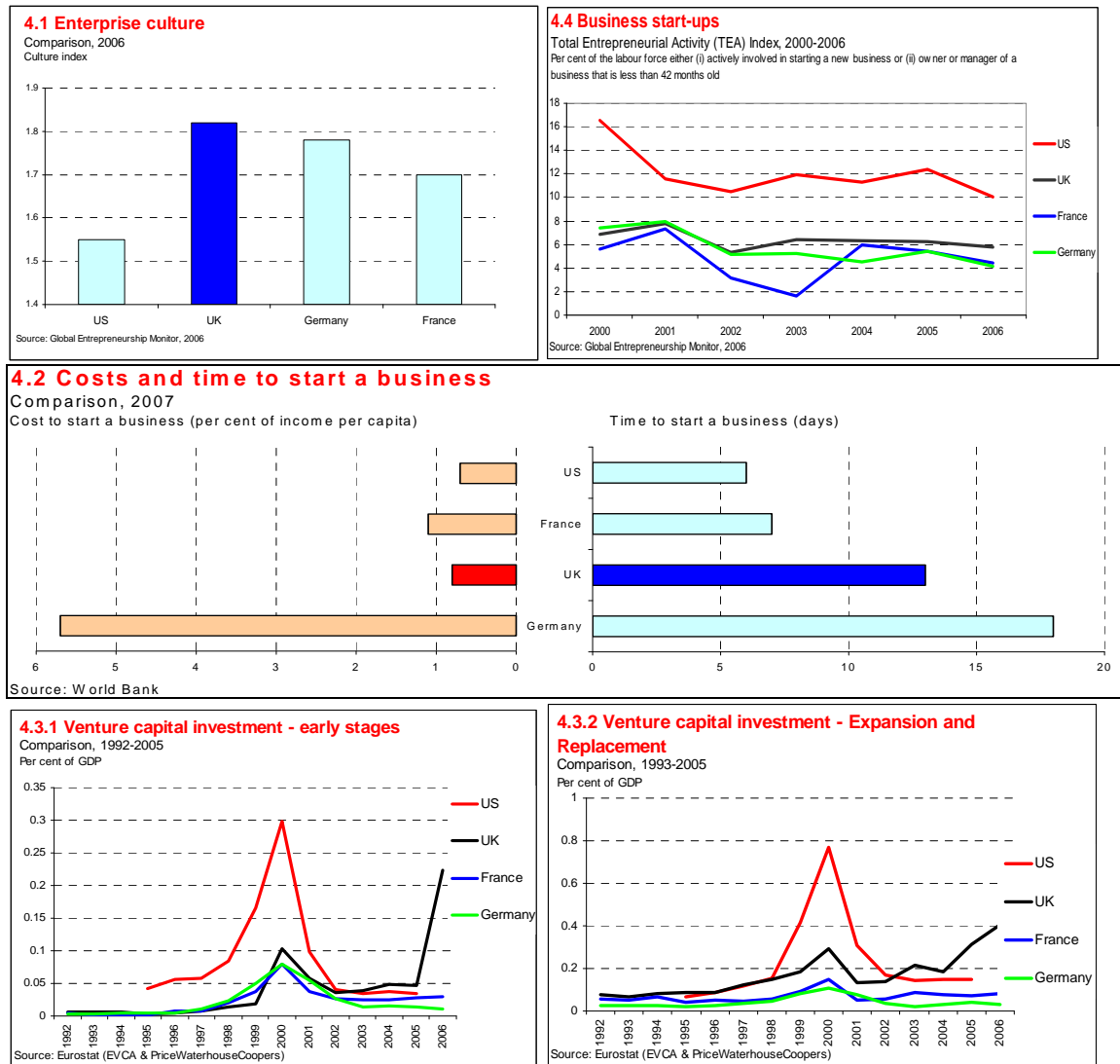
In summary, the UK is continuing to make good progress on improving skills, particularly in terms of boosted higher-level skills. However, there still appears to be a relative weakness on intermediate and basic-level skills, and perceptions of UK management skills also appear to be worse than those of our main competitors.

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<sup>13</sup> The discrepancy in UK levels between Charts 3.1 and 3.2 reflects the different age groups that are used in each measure and the inclusion/exclusion of inactive adults.

# ENTERPRISE

Enterprising activity refers to the seizing of new business opportunities by both existing firms and start-ups that bring new ideas, knowledge and skills into an economy. The overall market becomes more productive as increased competitive pressures encourage existing firms to become more innovative and less productive firms who cannot compete are forced to leave the market.<sup>14</sup> Barriers to enterprise, such as access to finance, inhibit the creation and growth of new businesses, in particular of smaller businesses.

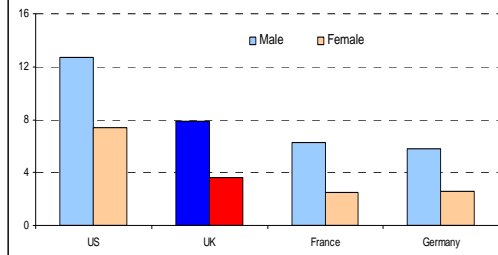


<sup>14</sup> Disney, Haskel and Heden (2003) find that 80-90% of total factor productivity growth comes from entry and exits of establishments with 30% of TFP growth coming from highly productive new firms and 50% coming from the exit of the least productive firms.

#### 4.5 Business start-ups by gender

Entrepreneurial Activity (TEA) Index by gender, 2006

Per cent of the labour force either (i) actively involved in starting a new business or (ii) owner or manager of a business that is less than 42 months old

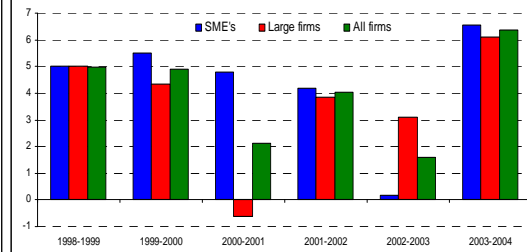


Source: Global Entrepreneurship Monitor, 2006

#### 4.6 Productivity growth (basic prices) by size of enterprise

UK comparison, 1999-2004

Per cent change in Gross Value Added (GVA) per employee



Source: ONS Annual Business Inquiry

Note: GVA is measured at basic prices (it is not deflated)

## Assessment

Progress appears to have been made in improving the attitude towards enterprise in the UK. Chart 4.1 shows attitudes to entrepreneurship<sup>15</sup> in the UK are good relative to all three comparator countries, in particular the US, which over the past year has experienced a substantial fall on this indicator from 1.84 in 2005 to 1.55 in 2006. This fall may be partly attributable to a general loss of confidence in the US economy, which has an impact on entrepreneurial activity.

However, when the level of total entrepreneurial activity (TEA) as measured by the percentage of the labour force involved in starting-up a new business or who are the owner or manager of a business that is less than 42 months old, (Chart 4.4) is considered, the US is still the clear leader. Performance on this indicator has fallen in all four countries over the last year, but the UK has fallen considerably more slowly than the other three. As a result, there has been a narrowing of the gap with the US and the UK has further extended its lead over France and Germany. This pattern is also shown in Chart 4.5 for both genders.

Chart 4.2 shows that the relative cost of starting a new business in the UK is lower than in France and Germany, and is now close to the US, while the time required to start a new business is higher than in the US and France. Charts 4.3.1 and 4.3.2 show that the UK performs well in comparison to France, Germany and the US on levels of venture capital investment, suggesting that UK firms have less difficulty with access to finance. Venture capital for early stage investment and for expansion and replacement have both increased in the last year, and substantial increases have been seen in the first of these categories. It is also clear from these charts that the dotcom bubble in the UK (and France and Germany) was far smaller than in the US.

Chart 4.6 provides a breakdown of productivity performance of UK firms by size of enterprise.<sup>16</sup> The data shows that there was a major recovery in performance in 2003-2004 for all firms, with Small and Medium Sized Enterprise (SME) growth outstripping the average for all firms and growing faster than large firms by almost half a percentage point. This implies that the UK SME sector is performing well.

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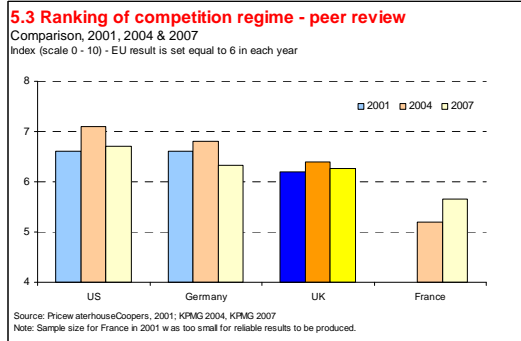
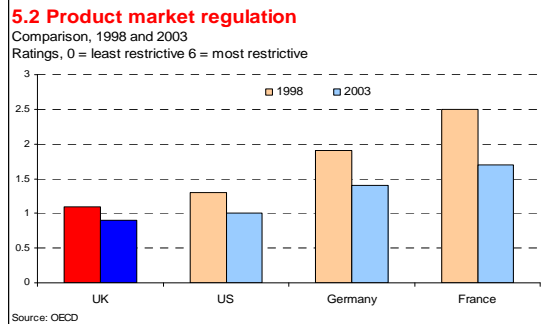
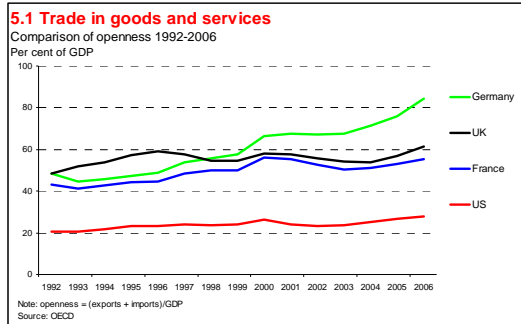
<sup>15</sup> Index is calculated from individual's perceptions of entrepreneurship and entrepreneurs, its suitability as a career choice and its coverage in the media. The higher the score, the more positive the attitudes to enterprise.

<sup>16</sup> A significant revision has been made to the 2002-2003 entry for SMEs which has affected the average, falling from 4.02% change in GVA per employee to 0.15%. Smaller revisions have also been made to 2000-2001 and 2001-2002 entries.

To summarise, in comparison to France and Germany, the UK performs well on the Enterprise driver. However, there still appears the need to catch up with the US. Progress has clearly been made, but further improvements could perhaps be made in encouraging entrepreneurship, particularly on the time taken to start a business.

# COMPETITION

Competition increases both allocative and productive efficiency and may also, via its impact on innovation, bring about additional increase in productivity. Competition acts to ensure that resources are used more productively across the economy and that waste is reduced within firms by forcing them to act efficiently in order to survive. In addition, competition acts at the industry level to raise productivity, by leading inefficient firms to exit the market and efficient firms to capture a larger share of the market. The rules and institutions of these markets, determined in large part by Government policy, are the major factor behind the degree of competition.



## Assessment

Openness to international trade and investment can be used as an indicator of the state of the competitive environment, as openness to international product and capital markets implies exposure to competitive pressure from abroad. Chart 5.1 suggests that the UK has a relatively open economy with exports and imports of goods and services representing over 60% of GDP. This is over double the percentage seen in the US, and although the UK has maintained its position just ahead of France, there is still a significant gap with Germany (84%), which has widened in recent years.

The restrictiveness of product market regulation, as assessed by the OECD, is the second indicator on the competition driver. Chart 5.2 shows that the UK's product market regulation regime has become even less restrictive since 1998, and it is at the second lowest level in the OECD (behind Australia). Product market regulation in the US is slightly more restrictive than here, while in France and Germany it is significantly more so.

KPMG's latest peer review of the perceived effectiveness of the UK's competition regime show a decline in the scores of the US, Germany and the UK, although France has improved considerably. However, the UK's ranking has fallen less than the US and Germany with the UK now almost on a par with Germany. The latest Global Competition Review rate of individual competition enforcement agencies continues to rank the Competition Commission and the Office of Fair Trading very highly. The CC is still ranked joint first ('elite') for 2006 alongside the European Commissions DG Competition and the US Federal Trade Commission and OFT is ranked in the top 10 ('very good').

Overall, the UK performs well on the competition driver, with the increased powers to the competition authorities determined through provisions of the Competition Act (1998) and the Enterprise Act (2002) continuing to have a positive impact. Product market regulation is still considered to be relatively light touch and the UK is relatively open to competition in the form of international trade and investment.

