

THE 2005
PRODUCTIVITY & COMPETITIVENESS
INDICATORS



HM TREASURY

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This document sets out the latest progress update on the Government's productivity and competitiveness indicators. These indicators form part of the monitoring framework underpinning DTI Public Service Agreement 1 and HM Treasury Public Service Agreement 5 to:

'Demonstrate progress by 2008 on the Government's long-term objective of raising the rate of UK productivity growth over the economic cycle, improving competitiveness and narrowing the productivity gap with our major industrial competitors.'

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.

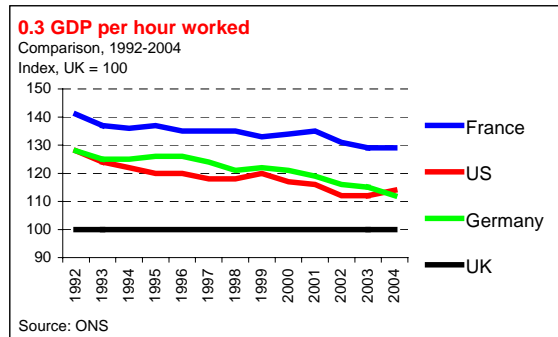
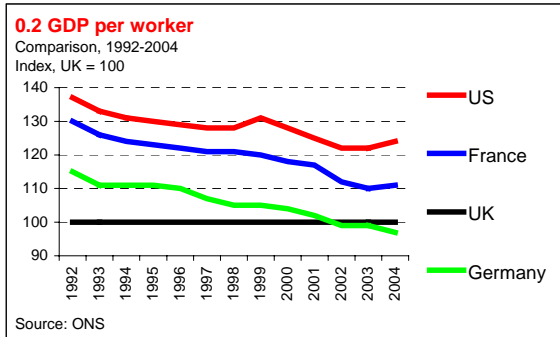
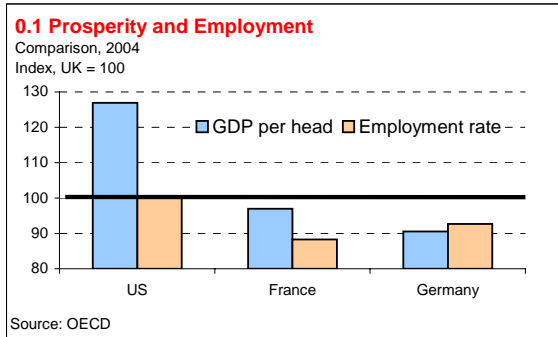
The DTI developed the first set of indicators in 1999, and has produced annual updates since 2001. Initially they provided a broad assessment of the UK's progress towards enhanced competitiveness, using a wide range of indicators. However, in March 2004, the Government reviewed the original set with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

EXECUTIVE SUMMARY

DRIVER	ASSESSMENT
OUTCOMES	The UK has made progress in recent years in improving prosperity (GDP per capita), through a mixture of a strong employment performance and productivity growth. Productivity growth appears to have increased slightly relative to previous economic cycles and there has been clear progress in closing the productivity gaps with France, Germany and the US, since 1995.
INVESTMENT	Despite a favourable macroeconomic climate, levels of business investment and government investment have remained low relative to our key competitors. However, following falls in recent years, business investment has stabilised, while government investment has increased.
INNOVATION	The UK continues to have a world-class science base, but its potential for supporting a strong innovation performance has yet to be fully realised. Levels of R&D expenditure and patenting remain low, but this partly reflects a relatively strong tendency towards non-R&D innovation and the use of non-patent intellectual property protection.
SKILLS	The UK performs relatively well in terms of high-level skills and is beginning to catch up with its competitors in terms of intermediate-level skills. However, the UK still has a very high proportion of people with only basic-level skills, and we appear to suffer from a management quality deficit with respect to our main competitors.
ENTERPRISE	There have been improvements in UK entrepreneurial culture and access to finance does not appear to be a major problem. The overall relative position is unchanged, however, with the UK ahead of France and Germany on most enterprise measures, but lagging the US.
COMPETITION	The UK continues to perform well on the indicators of competition relative to its main competitors, being relatively open to international trade and investment, having relatively low restrictiveness in terms of product market regulation and also a highly regarded competition regime.

OUTCOMES

Output per head is a widely used measure of a country's prosperity. The level of prosperity is dependent on how many people the output has to support and on the level of output. Output, in turn, is determined by the average amount produced by each worker – labour productivity – and the amount of labour employed.



Assessment

Chart 0.1 shows that prosperity (as measured by GDP per head) in the UK is substantially lower than in the US, but higher than in France or Germany. The UK's sustained strong employment performance (indicated by the employment rate also in chart 0.1) suggests that future increases in output per head are more likely to come about through productivity improvements than through increased labour utilisation.

The UK has a long-standing productivity gap with its main competitors. Chart 0.2 describes the trend in the gap, on an output per worker basis, whilst chart 0.3 does the same on an output per hour worked basis.

On the per worker basis, the gap with France has been halved since 1995, whilst the gap with Germany has closed. The change in the gap with the US was not statistically significant.¹

On the per hour worked basis, there has been some progress in recent years; since 1995 the gap has narrowed by 22% with France, 30% with the US and 54% with Germany. However, large gaps still remain, amounting to 12 percentage points with Germany, 14 with the US and 29 with France.

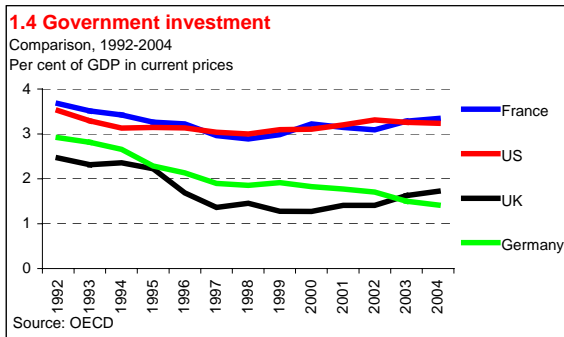
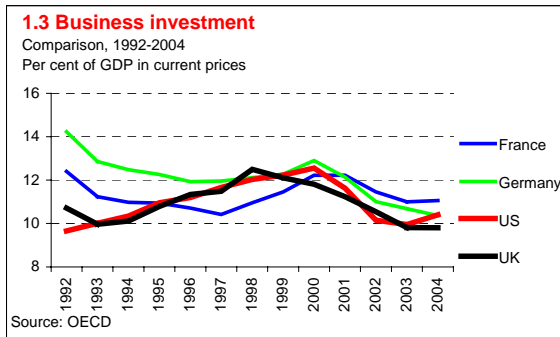
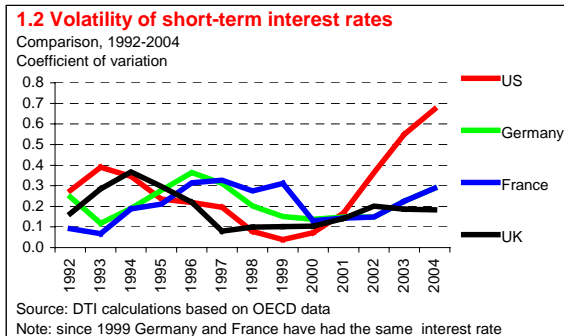
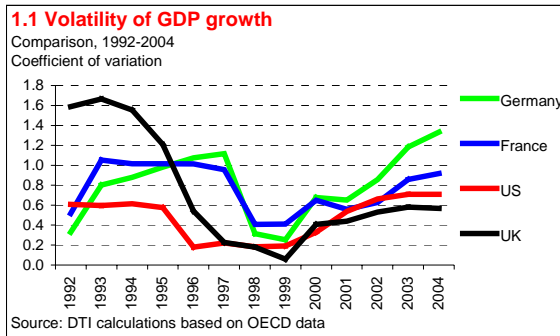
UK productivity growth in recent years has been higher on average than in the previous economic cycle. Specifically, productivity on a per hour basis is estimated to have grown by an annual average of 2.35 per cent between 1997H1 and 2005Q1, compared to 2.03 per cent over the last economic cycle, which lasted between 1986Q2 and 1997H1.

So, while progress has been made, there is still work to do in boosting UK productivity performance. The rest of this paper describes UK performance on the five drivers of productivity, identifying areas of strength and areas of weakness.

¹ Care has to be taken in interpreting these international comparisons of productivity, in particular because the latest data may also be subject to significant revision, and also because a country's productivity growth varies systematically with the economic cycle. To assess how the 'real' gaps have changed over time and eliminate the effects of the economic cycle, we compare the 2004 productivity data to that for 1995, when the four countries were at very similar points in their economic cycles.

INVESTMENT

By increasing the amount of machinery and equipment available to each worker, and by bringing new technology to the production process, investment in physical capital increases labour productivity and growth. Research suggests that relatively low levels of capital stock in the UK in 1999 appeared to explain around four-fifths of the productivity gap with France and around half of the gap with Germany.² Investment will be influenced by the macroeconomic climate, and the availability of technological and growth opportunities.



² O'Mahony, M. and de Boer, W., 'Britain's relative productivity performance: Updates to 1999', NIESR 2002. This finding applies to the market economy of each country only.

Assessment

The UK has a relatively stable macroeconomic climate. Charts 1.1 and 1.2³ 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. However, this has not translated into a strong 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. The downward trend since 1998, which emerged in all four countries, appears to have now stabilised. Chart 1.4 describes how 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 German government investment in 2004.

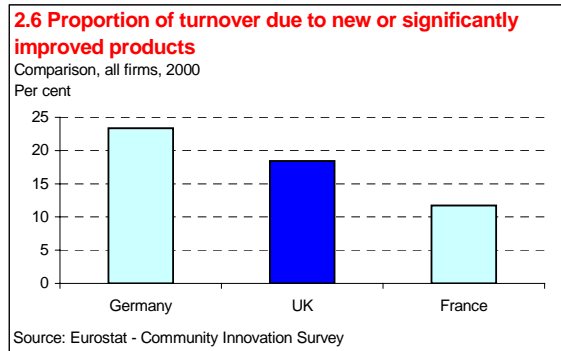
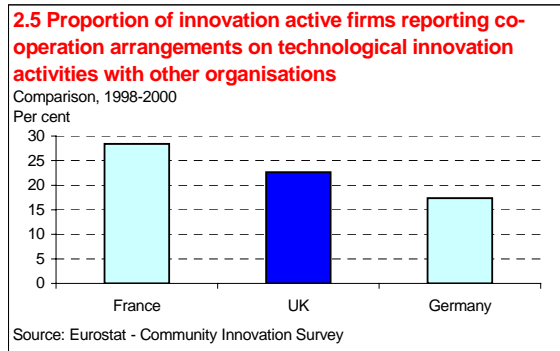
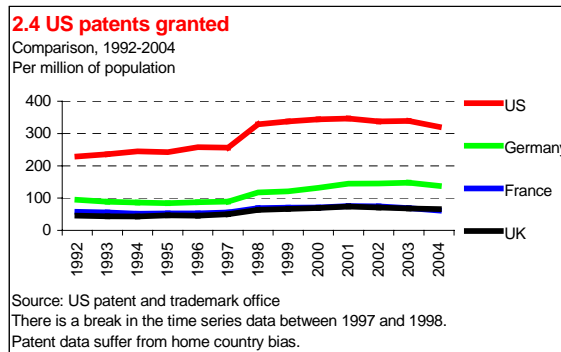
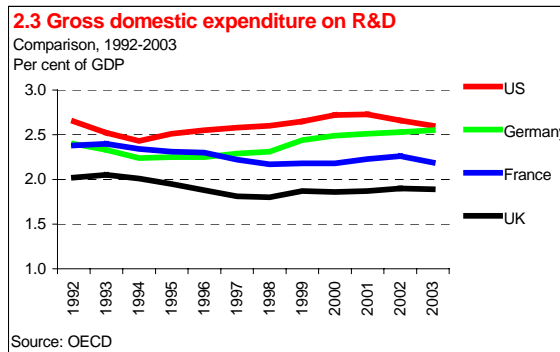
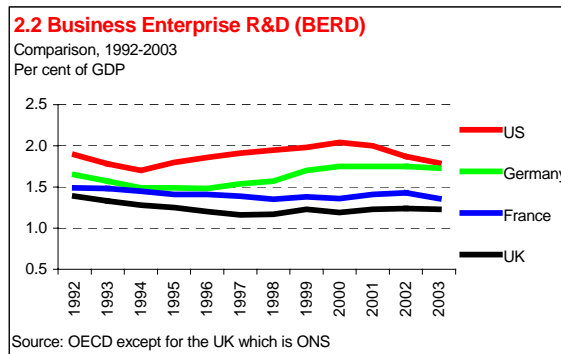
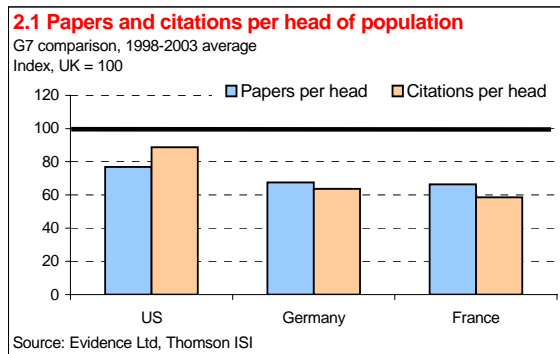
Low business and government investment over the last few decades has left the UK with comparatively low capital stocks and a weaker transport infrastructure than our key competitors. Low capital stocks imply lower labour productivity, while limitations in public infrastructure can increase business costs, also reducing productivity, as each unit of output costs more to produce. 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. This could imply that UK firms face greater incentives to employ labour instead of capital.

In summary, macroeconomic stability is a sign that the investment climate is relatively attractive, and the foundations are there for businesses to increase investment. However, despite some improvement, investment and capital stock levels in the UK remain significantly below those of our main competitors.

³ 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.

INNOVATION

Innovation drives productivity growth and economic growth in the long run. It includes organisational change, adopting and adapting new technology, and the introduction of new goods and services. It is likely that innovation explains a large part of the productivity gap between the UK and the US. Empirical research found that around four-fifths of this gap in 1999 was explained by the total factor productivity residual, or in other words the efficiency with which the labour and capital inputs are combined to produce output. Total factor productivity improvements reflect innovation and technological spillovers amongst other factors.⁴



⁴ O'Mahony, M. and de Boer, W., *ibid.* Since the total factor productivity element is a residual, it may also be capturing other factors, e.g. unaccounted for capital and labour heterogeneity, or measurement error.

Assessment

The UK has a strong science base. Chart 2.1 shows that 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. 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.

However, there are indications that this knowledge base is not being transferred into business innovation. Chart 2.2 shows how business expenditure on R&D has been consistently below that of the US, France and Germany for many years, whilst chart 2.3 shows the same pattern for total expenditure on R&D across the whole economy. Expenditure on R&D is an indicator of the amount of resources an economy allocates to the generation of new knowledge. However, the knowledge created by R&D tends to be technological in nature and hence R&D is more relevant in some industries than others. There is evidence that part of the reason for the UK's low R&D performance is that the UK's industrial structure involves relatively less R&D-intensive industry.⁵

Chart 2.4 looks at the UK's comparative performance on one commonly used measure of innovation output: patents. Unsurprisingly, given inherent home country bias, UK firms are granted relatively fewer patents in the US than US firms. However, German firms are granted a greater number, while French firms perform approximately the same as UK firms, relative to their respective populations. This suggests that the UK has a lower innovation output than Germany, but there is evidence from the Community Innovation Survey that UK firms are relatively more likely than their continental European counterparts to use non-patent intellectual property protection, such as trademarks, copyright, lead time and secrecy.

Cooperative innovation arrangements are thought to be beneficial, in general, to overall innovation output, as risks, financial resources and talent can all be pooled across organisations. Chart 2.5 shows that a higher proportion of UK innovation-active firms are involved in cooperative arrangements in technological innovation than of German firms, but that the proportion of French firms engaged in cooperation is greater still.

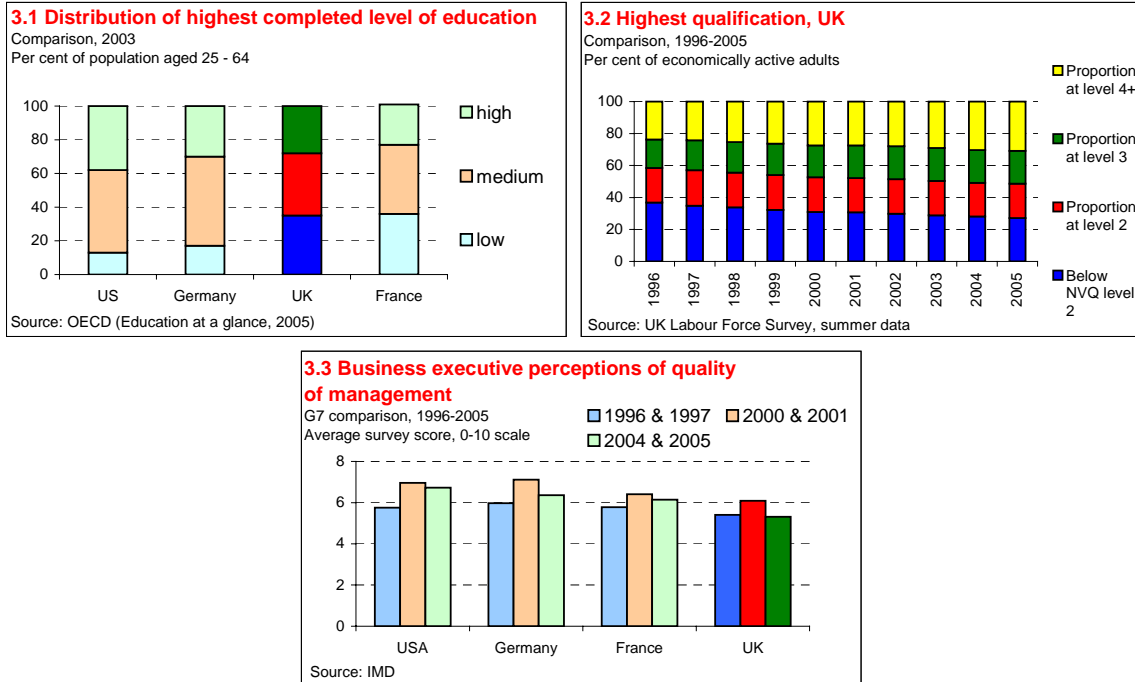
Finally, chart 2.6 shows the proportion of firms' output accounted for by new or improved products. On this measure, UK firms appear to be less innovative than German firms, but more innovative than French firms.

In summary, these indicators give a mixed message on innovation. The UK has a strong science base, but low levels of R&D and patenting (which can partly be explained by UK-specific factors) and middling levels of cooperation and innovations as a proportion of turnover.

⁵ See DTI Economics Paper No. 11 *R&D-intensive businesses in the UK*, available from <http://www.dti.gov.uk/economics>

SKILLS

Empirical evidence shows that higher levels of skills are associated with higher levels of productivity.⁶ Skills are integrally linked to innovation, as they are necessary to implement new innovations successfully and they are an important part of the creative process. With a more skilled managerial and general workforce, firms are better able to introduce new technology and organisational change. Skills can be developed through education and also training throughout an individual's working life.



⁶ At a macroeconomic level, growth accounting provides evidence of a link between skills and productivity - see e.g. O'Mahony, M. and de Boer, W. *ibid*.

Assessment

The UK's performance on workforce skills is mixed. As chart 3.1 shows, by OECD standards, the UK has a relatively high proportion of people with degrees, including degrees in science, engineering and technology, although this proportion is still significantly behind that seen in the US and slightly behind Germany. The UK has a low proportion of its population qualified at the intermediate level, below all three comparator countries, and concerns are often raised about the quality of UK vocational qualifications at the intermediate level. This leaves the UK with a large proportion of people with low-level skills, on a par with that of France, but with over twice the proportion seen in Germany and the US.

Chart 3.2 shows that the UK skill profile has been improving over the last ten years. The percentage of the UK's adult population in work or actively seeking it who possess skills lower than Level 2 has declined to 27 per cent in 2005, from 37 per cent in 1996.⁷ As can be seen in the chart, most of the progress has come in the form of an increased proportion of people at level four and above, whilst the proportion at levels 2 and 3 has barely changed. Overall, whilst progress is being made on workforce skills, this implies that there is still some way to go to catch up the US, France and Germany on intermediate skills.

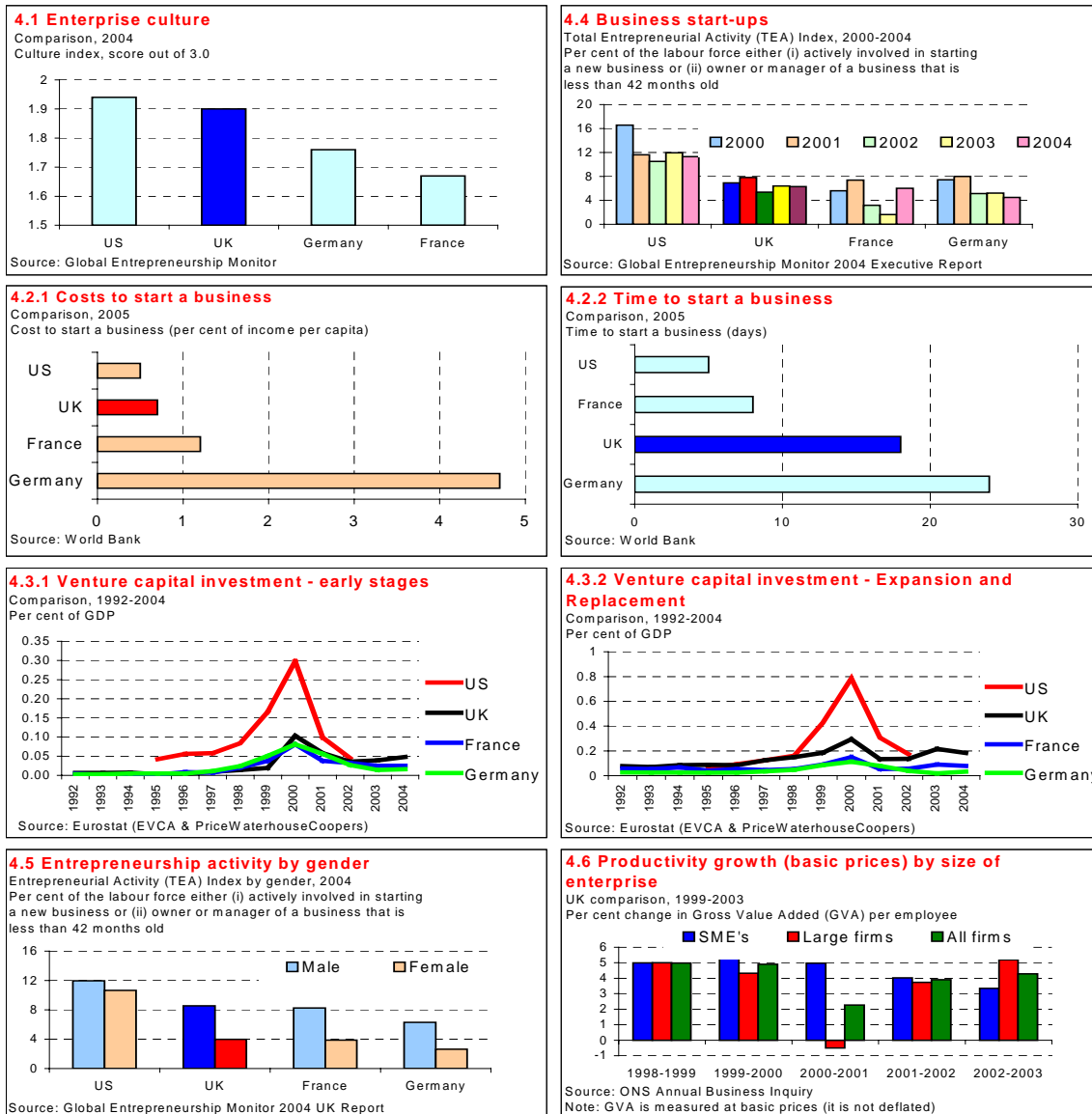
On management skills, there is a lack of robust internationally comparable data. Definitions of managers and management vary across countries. However, the available evidence points towards UK weakness in management. For example, as shown in chart 3.3, international surveys of business executives' perceptions of the quality of management, such as that conducted by the International Institute for Management Development, suggest that UK managers lag their colleagues in the US, France and Germany in terms of perceived competence and experience.

In summary, whilst the UK has been making good progress in recent years at improving our skills profile, most of this progress is concentrated in higher-level skills, with clear weaknesses remaining with respect to intermediate and basic-level skills. UK management skills also appear to be worse than those of our main competitors.

⁷ 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

Entrepreneurship, through start-up activity or innovative activity within existing firms, drives productivity growth by increasing competitive pressure in the market place, introducing new products and services, and raising the incentive for incumbent firms to invest, innovate and seek efficiency and quality improvements. Firm-level evidence suggests that new high-growth establishments play an important role in driving productivity growth through the displacement of less efficient firms and processes, and the reallocation of labour and capital to more productive activities.⁸



⁸ E.g. Disney, Haskel and Heden (2003) find that 80-90% of total factor productivity growth comes from entry and exits of establishments

Assessment

Overall, there is a relatively favourable attitude to enterprise in the UK. Chart 4.1 depicts the survey evidence on attitudes to entrepreneurship from the Global Entrepreneurship Monitor. This index is calculated from individuals' perceptions of entrepreneurship and entrepreneurs, its suitability as a career choice and its coverage in the media. The higher the score, the more positive are attitudes to enterprise. The UK performs well relative to France and Germany, but not as well as the US. The same relative rankings pertain on the level of entrepreneurial activity as a percentage of the labour force, as shown in chart 4.5. This applies to both genders.

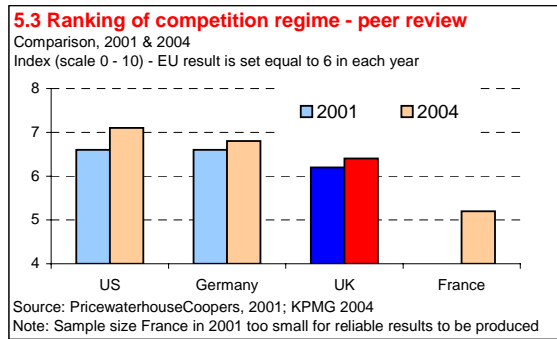
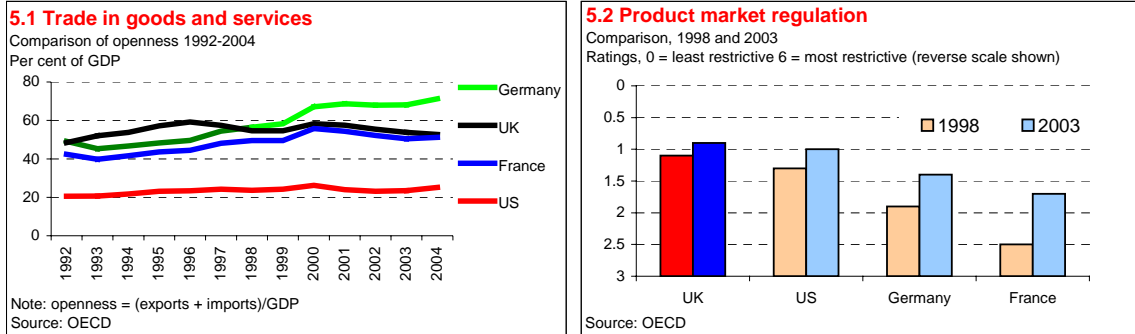
The relative cost of starting a new business in the UK is lower than in France and Germany, but higher than the US, whilst the time required to start a new business is higher than in the US and France, as shown in charts 4.2.1 and 4.2.2. Charts 4.3.1 and 4.3.2⁹ show that the UK compares favourably with France and Germany on levels of venture capital investment, suggesting that UK firms have less difficulty with access to finance. It is also clear from this chart that the dotcom bubble in the UK was far smaller than in the US. This familiar ranking pattern - ahead of France and Germany, but behind the US - also applies to business start-ups (chart 4.4). Finally, chart 4.6 shows that SMEs have enjoyed faster productivity growth than average firms in the last five years, which may imply a well performing SME sector.

To summarise, in comparison to France and Germany, the UK performs well on the Enterprise driver. However, there is a substantial gap relative to the US, and further improvements could perhaps be made in improving attitudes and lowering barriers to entrepreneurship.

⁹ Data is not available for the US for 2003 and 2004.

COMPETITION

The degree of competition in product, labour and capital markets affects the degree of efficiency with which the markets operate and hence directly influences productivity. The rules and institutions of these markets, determined in large part by Government policy, are the major factor behind the degree of competition.



Assessment

One indicator of the state of the competitive environment is openness to international trade and investment; openness to international product and capital markets implies exposure to competitive pressure from abroad. As chart 5.1 suggests, the UK performs relatively well on this measure, with around half of its GDP accounted for by exports and imports, well ahead of the US, just ahead of France, but a fair way behind Germany. The UK also has the highest stock of inward investment as a proportion of GDP of any G7 country.¹⁰

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. Product market regulation in the US is slightly more restrictive than here, while in France and Germany it is significantly more so.

Finally, the perceived effectiveness of the UK's competition regime, as measured by the 2004 KPMG-led expert peer review, has improved since 2001, but remains behind that of the US and Germany. Another assessment, the Global Competition Review 2004, concluded more positively that the Competition Commission and the Office of Fair Trading were respectively joint first and joint second in the world in the ranking of individual competition enforcement agencies.

Overall, the UK appears to perform well on the competition driver. The recent changes to the competition regime are regarded as having improved the effectiveness of the UK competition regime, though more time is still needed for the changes to fully bed down. Product market regulation is relatively light touch and the UK is relatively open to competition in the form of international trade and investment.

¹⁰ Source: UNCTAD World Investment Report 2005