Driving Productivity and Growth in the U.K. Economy

McKinsey
Global
Institute

with assistance from our Advisory Committee
Bob Solow, Chairman
Ted Hall
Stephen Nickell

October 1998

Preface

This report is an end product of a year long project by the McKinsey Global Institute, working closely with members of McKinsey's London office, on the economic performance of the United Kingdom.

McKinsey undertook this project as an important step in developing our understanding of how the global economy is working. We also thought it would be important to resolve the paradox of why, if the US and the UK both have "Anglo- Saxon" economies, their economic performance is so different. We have undertaken this work as an investment by McKinsey in knowledge building, and of course, are solely responsible for the results.

This project builds upon the previous work of the McKinsey Global Institute in assessing economic performance among the leading economies of the world. Our earlier reports addressed separately labour and capital productivity and employment[1], the fundamental components of economic performance. Later, we combined these components to address the overall performance of Sweden, Australia, France, Germany, the Netherlands, Brazil and Korea[2]. In all countries, economic performance is compared with the US, and in some countries with Japan. This study continues our efforts to assess economic performance at the country level.

As before, the core of our work is conducting sector case studies to measure differences in productivity, output and employment performance across countries and to determine the reasons for the differences. This work provides the basis for our conclusions about how to increase productivity and output levels in the UK.

This report consists of four chapters and an executive summary. Chapter 1 describes our project objectives and approach. Chapter 2 describes our analysis and conclusions at the aggregate level. This chapter provides our conclusions about what can be learned from aggregate level analysis and what questions need to be addressed at the sector case study level. Chapter 3 comprises the six sector case studies: automotive, processed food, food retailing, hotels, telecommunications, and software. Each case starts with a short executive summary, and then gives the results of our productivity calculations and discusses the reasons for the differences we found between the UK and benchmark countries. Chapter 4 presents the synthesis of our findings including our overall conclusions about the economic performance of the UK and how to improve it.

A core team of six consultants from McKinsey's London office and four consultants from the McKinsey Global Institute participated on the working team for this project at various times. The London based consultants were Michaela Ballek, Claire Craig, Vicki Harris, Bruce Levi, Helen Mullings and Iain Osborne. The Global Institute consultants were Scott Anthony, Denis Bugrov, James Kondo, and Vincent Palmade. In addition, Jaana Remes, a McKinsey Global Institute economics research specialist, participated in the aggregate analysis and synthesis. Administrative support was provided by Gretchen Bossert, Ronni Brownlee, Leslie Hill Jenkins and Joanne Stewart.

1 *Service Sector Productivity*, McKinsey Global Institute, Washington, D.C., October 1992; *Manufacturing Productivity*, McKinsey Global Institute, Washington, D.C., October 1993; *Employment Performance*, McKinsey Global Institute, Washington, D.C., November 1994; *Capital Productivity*, McKinsey Global Institute, Washington, D.C., June 1996.

2 *Sweden's Economic Performance*, McKinsey Global Institute, Stockholm, September 1995; *Australia's Economic Performance*, McKinsey/Australia and McKinsey Global Institute, Sydney, November 1995; *Removing Barriers to Growth in France and Germany*, McKinsey Global Institute, March 1997; *Boosting Dutch Economic Performance*, McKinsey Global Institute and Max Geldens Foundation for Societal Renewal, September 1997; *Productivity-The Key to an Accelerated Development Path for Brazil*, McKinsey Brazil Office and McKinsey Global Institute, Sao Paulo, Washington, March 1998; *Productivity-led Growth for Korea*, McKinsey Seoul Office and McKinsey Global Institute, Seoul, Washington, March 1998.

Vicki Harris was responsible for day-to-day management of the project, withVincent Palmade leading the analytical work during the synthesis phase. The project was conducted under the direction of Simon Fidler. Oversight of the project was provided by Nick Lovegrove and myself, assisted by Martin Baily.

In carrying out the work we were fortunate to have an external Advisory Committee. This was chaired by Professor Robert Solow of MIT, and also included Professor Stephen Nickell of LSE and Ted Hall, Chairman of the McKinsey Global Institute Advisory Board. The working team had four all-day meetings with the Advisory Committee to review progress during the course of the project and benefited from many written comments and individual discussions.

Throughout the project we benefited from McKinsey consultants' unique worldwide perspective on and knowledge of the industries investigated in our case studies. This knowledge has been developed through work with clients and investment in understanding industry structure and behaviour to support our client work. McKinsey sector leaders provided input to our case studies and reviewed our results. McKinsey's research and information departments provided invaluable information and insight under very tight time constraints.

Finally, we could not have undertaken the work without the information received in our numerous interviews with corporations, industry associations, government officials and others. We thank all the individuals concerned for their time and help but would stress that we are solely responsible for the results. We would also emphasise that the work is independent and has not been commissioned or sponsored in any way by any business, governmental or other institution.

Bill Lewis
Director of the McKinsey Global Institute
October 1998

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Preface

This report summarises the findings of a year-long project conducted by the McKinsey Global Institute in conjunction with McKinsey's UK office. It is accompanied by a fuller report that provides further details of our analysis, methodology and conclusions.

The study builds on earlier research by the McKinsey Global Institute to assess the economic performance of leading economies around the world. As in previous studies, we have conducted detailed sector case studies in order to measure differences in productivity between different countries, and to determine the reasons for these differences. In many cases, we have found they arise from unresolved conflicts between social and economic objectives. We make no attempt to judge these objectives; our purpose is simply to quantify their impact on national economic performance.

In conducting the project, we have drawn on the counsel of an external advisory committee. Chaired by Professor Robert Solow of the Massachusetts Institute of Technology, it also included Professor Stephen Nickell of the London School of Economics and Ted Hall, Chairman of the McKinsey Global Institute Advisory Board.

We could not have undertaken this work without the support of many companies, industry associations and government officials. We would like to thank all those involved for their help and time, but stress that McKinsey alone is responsible for the conclusions we draw. We would also emphasise that the work is independent and has not been commissioned or sponsored in any way by any business, governmental or other institution.

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Introduction

The United Kingdom has an opportunity unique among OECD nations to increase its rate of economic growth. By tackling the enduring problem of low labour productivity that so handicaps the UK economy, the United Kingdom could realise the untapped growth potential in many key industries. The prize could be a trend growth rate, over the next ten years, well ahead of the G7 average. In the process, it could catch up and even pass the economic performance of other leading European countries.

Our study reveals that the United Kingdom currently lies bottom of the G7 league table in terms of output per capita, and points to labour productivity as the main cause. It also examines the reasons behind this productivity shortfall.

By benchmarking UK-based companies against the world's top-performing countries in a representative sample of key market sectors, the study explores what UK companies are doing differently at an operational level and why, and how these differences contribute to the productivity gap. We have found that UK management often fails to adopt global best practices even when in some cases these are readily understandable and achievable.

There are several reasons for this state of affairs, and they vary by market sector. But the most pervasive explanation lies in the effect of regulations governing product markets and land use on competitive behaviour, investment and pricing. In some cases, these regulations constrain competition by limiting the ability of best-practice operators to enter or expand, which in turn reduces the competitive pressure on other industry participants to raise their productivity. In other cases, the regulations prevent the adoption of best practices or render it uneconomic.

This conclusion may seem counterintuitive to many; after all, the United Kingdom is widely perceived as having a relatively deregulated and open economy. Indeed, that is the case in the areas of labour regulation and capital market operation. However, in two other major areas, specific product market and land use regulations, the United Kingdom appears to have far more in common with its continental neighbours than with the more deregulated United States. Having undertaken a number of country studies in recent years, including those covering France, Germany, the Netherlands and Korea, the McKinsey Global Institute has concluded that product market and land use regulations are primary explanatory factors for the large differences in GDP per capita between the United States and other OECD nations.

In the United Kingdom, with its relatively flexible and efficient labour and capital markets, the effect of these market distortions manifests itself primarily in low labour productivity. In countries such as Germany with more regulated labour and capital markets, it is observed in lower levels of employment and lower capital productivity.

Our study also shows that the reasons most frequently invoked for the United Kingdom's economic underperformance – low capital investment, poor skills and sub-scale operations – are often the consequences of these market restrictions. As such, they are important secondary effects rather than primary root causes of economic problems. Low capital investment, for instance, is largely the result of the lack of opportunities for profitable investment: new retail or hotel formats, say, may suffer from a dearth of access to sites on which to build, as well as high construction costs when sites are available. Low skills have often been overcome by best-practice operators using tailored processes and intensive job-specific training programmes. And where low scale is a factor, it is often caused by regulatory restrictions on competition or land use rather than the limited demand of a relatively small national market.

Regulations are not the only barrier to the adoption of best practices. Clearly, governments can shape industry conduct by determining the conditions and incentives under which companies compete. But managers can be inclined to use regulatory restrictions and lack of competitive intensity as excuses not to improve productivity, even when it is both possible and in the best interests of their companies to do so. Government, management, trades unions and employees all have important parts to play in improving productivity and unleashing the United Kingdom's growth potential.

This report aims to provide an objective assessment of the growth opportunity available to the United Kingdom, starting from an analysis of how the economy performs today and how it might work if some of the constraints to higher productivity were removed. We believe that the opportunity is considerable. The performance gap between the United Kingdom and other countries is wide, but if regulatory and competitive barriers were removed, many of the remaining barriers to the adoption of best practices could be overcome relatively quickly. Whatever the state of the global economy and the country's position in its economic cycle, the rate of economic growth would then be substantially greater than it would otherwise be. The pressures of an increasingly turbulent global economy make it all the more vital for the United Kingdom to seize this opportunity.

But this cannot be done without enormous effort. The UK government will need to transform key elements of the existing economic and social policy infrastructure and create a modern framework of commercial regulation, incentives and penalties designed to encourage high competitive intensity and the rapid adoption and spread of global best practices. For their part, the management and workforces of UK companies will have to compete more strenuously for leadership in domestic and global markets and make productivity improvements a central pillar of their performance objectives.

We hope that this study will contribute to a better understanding of the opportunity and the challenge of productivity-driven growth.

1. The Growth Opportunity

Productivity could be the engine of accelerated growth in the UK economy, with tangible benefits for everyone. But releasing the barriers to productivity-driven growth will take time and effort, and will also require the United Kingdom to revisit some of the critical trade-offs between social and economic objectives.

BENEFITS FOR THE ECONOMY

Increases in productivity could significantly accelerate the rate of growth in the UK economy. The magnitude of that acceleration will clearly depend upon the rate at which the barriers to productivity growth can be released and productivity-enhancing investments made. It will certainly not happen overnight.

But taking the long-term view, we have estimated the potential economic rewards of catching up with *today's* level of GDP per capita in the United States over, say, the next decade. The impact of such a step change in growth would be felt in every aspect of the economy – real incomes, government spending and employment. For instance:

- **Real disposable incomes would rise.** Greater productivity enables people to purchase more goods for each hour they work. Within a decade, disposable income per capita would be 10 - 15 per cent higher than they would otherwise be -- equivalent to an increase in average household income of up to £2,500 at current prices. In practice, the rise in real incomes would result primarily from the beneficial combination of higher nominal wages and lower prices. Productivity increases of the kind we envisage could, for instance, cut current car prices by 10 per cent, or around £1,000 for the average car.
- **Higher economic growth would translate into bigger government receipts,** which could fund increased investment in social infrastructure or help achieve other policy goals. The potential incremental increase in annual government revenue at current average tax rates would be equivalent to 120 per cent of today's annual health budget, 140 per cent of the education budget, or 50 per cent of the social security budget. Alternatively, taxes could be

lowered while maintaining the current level of receipts. Reductions could be applied across the tax structure or aimed at encouraging investment and further productivity gains.

- **Employment opportunities would improve.** Higher productivity would remove many of the artificial barriers to the creation of new jobs. It would also enable a shift towards more highly skilled and better-paid jobs. As an example, we estimate that the United Kingdom could create at least 75,000 additional jobs in information technology services – a sector with a current average salary of £30,000, well over 50 per cent above the national average.

Of course, we must assume that over the next decade, the United States will significantly improve upon its current level of productivity – as will Germany, France and other OECD countries. So even with substantial increases in productivity, the United Kingdom may still be behind. But in seeking to catch up, it will have generated significant additional wealth for its citizens.

BENEFITS FOR BUSINESS

It is not the brief of business managers to increase the overall productivity and growth of the economy. They must concentrate on what is best for their own companies, shareholders, employees and customers. Since companies can often make attractive profits without being particularly productive, they may lack incentives to raise productivity. This state of affairs is usually the result of restrictions on competition that enable companies to establish artificially high price umbrellas, which in turn support high profit margins despite low productivity.

Where competitive restrictions within an industry sector are absent, on the other hand, there tends to be a strong direct relationship between productivity and profitability. Governments can thus spur companies on to higher productivity by opening markets to wider and more intense competition.

Wide productivity gaps will ultimately be unsustainable in a global marketplace in which customers have their pick of goods and services from anywhere in the world and best-practice companies seek to extend their advantage into more and more national markets. In such an environment, companies that fall behind the global benchmarks for productivity will grow less profitable, and eventually become unviable. Clearly, productivity matters to business as well as government.

OPPORTUNITIES AND TRADE-OFFS

There is, however, an important caveat. Though improved productivity offers economic opportunities, social trade-offs will have to be made if these opportunities are to be fully realised.

Consider the *food retailing* industry, one of several market sectors in which the United Kingdom is a world leader. Our study suggests that UK retailers are not distinguished by their labour productivity; they achieve only 75 per cent of the benchmark set by France. But in terms of total factor productivity – labour and capital productivity combined – the United Kingdom sets the global standard jointly with France.

Why is this? Evidence suggests the reason is that the UK food retailing sector has been a pioneer in applying the kind of operating and marketing practices that generate high productivity. Its leading food retailers have:

- Invested heavily in store buildings, fixtures and fittings, EPOS technology and logistics.
- Defined global best practices in logistics and space management.
- Led the way in training, skill transfer and management development at every level.
- Innovated their way to growth by developing private label, chilled food, non-food merchandise, convenience formats, personal financial services and petrol retailing.

Though it can be seen as a success story, an example of what can be done, even food retailing is some way short of achieving its full potential. The overall figure for sector productivity is an average of all companies in the sector. More detailed analysis reveals that performance in food retailing, as in several other product markets, is "bi-polar": there is a handful of very strong performers and a long tail of weaker ones that drag down average productivity.

The average would certainly be higher if the leading performers commanded a bigger share of the market. Whether this would be desirable in terms of its effect on competition is a matter for debate. But it is clear that the evolution of the food retailing sector towards its full productive potential is being constrained by regulations that discourage the spread of modern large-scale retail formats. Without such regulations, the leading performers would inevitably gain market share.

Although the United Kingdom is one of the most deregulated economies in Europe, it retains a plethora of regulations governing the use of land and property that are intended to protect the nation's countryside, high streets and heritage. The powers of regulation are widely distributed and often highly devolved. Their direct and indirect effect is to restrict productivity-driven growth, and not only in the food retailing sector.

Our study reveals, for example, that land and property regulations also constrain the hotel and software industries. More broadly, their effects can be seen in industries as diverse as airlines, banking and general merchandise retailing. By contrast, the combined effect of deregulation in capital markets and a liberal approach to the use of land in London's Docklands during the 1980s fostered dramatic growth in investment banking and securities, a field in which the London market now leads the world.

This is not an argument for the wholesale lifting of land and property regulations. Few of us would doubt that a degree of regulation is necessary, whether to reflect the size of the country and its population density, to prevent traffic congestion, or to preserve historic buildings. What matters is that decisions are made on the basis of full and accurate information and appropriately balanced objectives. When we make choices as a society, we should have as complete an understanding as possible of their economic consequences.

* * *

The United Kingdom faces an important opportunity to increase its rate of growth by enhancing productivity in many of its market sectors. The economic and social benefits would be substantial, and evidence from food retailing and wholesale banking suggests that it can be done. Indeed, in several respects, the country is better equipped than many other developed economies to capture the prize of superior productivity. The pursuit of this prize does mean, however, that society must confront some difficult trade-offs that may ultimately limit what can be achieved.

The remainder of this report describes the nature of the problem, opportunity and trade-offs in more detail.

2. The Productivity Problem

The United Kingdom has an opportunity to improve its economic performance substantially. Our study reveals the size of the performance gap and its underlying characteristics.

The country's overall economic performance in terms of GDP per capita continues to lag that of the principal benchmark countries. Reforms to labour and capital markets in the 1980s and 1990s have halted its relative decline, but it still comes bottom of the league table of G7 countries, and the gap shows no signs of closing *(Exhibit 1).*

In the market sector (excluding government services, health and education) on which our study focuses, the United Kingdom's output per capita lags that of the United States, the leading global benchmark, by as much as 40 per cent, and the leading European benchmark, West Germany, by 20 per cent.

Output levels are determined by two factors: the level of labour and capital inputs that are used in an economy, and the efficiency with which these inputs are deployed, or the productivity of the economy. Total factor productivity (TFP), or labour and capital productivity combined, is the ultimate driver of economic performance.

PRODUCTIVITY

In terms of total factor productivity, the United States is the global benchmark, leading West Germany and France by around 10 per cent and the United Kingdom by 26 per cent *(Exhibit 2).* The gap between the United Kingdom and the United States is greater in labour productivity than in capital productivity. Moreover, labour makes up about two-thirds of the total inputs used in the economy. As a result, the reasons for the labour productivity gap also account for much of the gap in total factor productivity, so we have focused our analysis on labour productivity *(Exhibit 3).*

The United Kingdom's smaller total factor productivity gap with West Germany (and France) is the result of higher capital productivity that offsets some of the labour productivity gap. This further reinforces the importance of explaining the United Kingdom's relatively poor labour productivity.

LABOUR INPUTS

In recent years, the United Kingdom's problem has been much more one of labour productivity than of employment. Our analysis shows that the country has been quite effective at generating employment, so that labour inputs (or total hours worked) per capita are now relatively high: not so high as in the United States, but well ahead of France and, after adjustment for demographic differences, also ahead of West Germany.

How can the UK economy deliver high employment yet low labour productivity? The answer is that because of flexible labour markets, economic underperformance does not necessarily translate into considerably lower employment. Rather, employers simply tolerate lower productivity, rewarding it with lower wages. By contrast, countries with less flexible labour markets, such as France and Germany, have to some extent priced low-skilled jobs out of existence because the minimum cost of labour to employers is too high to sustain them *(Exhibit 4).* This helps push up total labour productivity in these countries, while economic underperformance, particularly in France, shows up in the unemployment figures.

So the evidence suggests that the flexible UK labour market works in helping to create jobs. Indeed, the country's record of net job creation in the service sector over the past 25 years has been considerably better than that of France and West Germany, although well behind that of the United States *(Exhibit 5).* The United Kingdom has been particularly distinctive in its levels of part-time employment *(Exhibit 6).* It seems that for many service providers such as retailers and hotels, part-time employment represents the most productive use of relatively low-skilled labour, allowing staffing availability to be closely matched to customer flow. Part-time work also responds to social trends: the need and desire of women (and increasingly men) to work while balancing household and family demands, and the re-entry of senior citizens into the workforce.

CAPITAL INPUTS

Our study has also explored another important dimension of economic performance: the role of capital investment in driving economic growth. We have confirmed that the United Kingdom has relatively low capital intensity, investing much less capital per hour worked than the United States, West Germany or France *(Exhibit 7).* Why doesn't the United Kingdom invest more? We come back to this question later. But it is important to recognise that the relationship between capital intensity and economic output is a complex one. It does not follow that simply by raising its level of capital intensity (that is, by investing more for every hour worked), the United Kingdom would necessarily increase its total factor productivity.

We have not uncovered any evidence that UK companies and investors are systematically forgoing investments whose benefit, in terms of increased labour productivity, would be sufficient to create a reasonable financial return on the capital. To achieve its full economic potential, the United Kingdom almost certainly does need to increase its levels of investment substantially, but that is only likely to happen if some or all of the constraints that limit returns on capital are relaxed.

As we have seen, the output per capita of the UK market sector is far below that of the United States, and well below that of West Germany. However, in general it appears that West Germany is less compelling as a benchmark for economic performance than the United States. As explained in the box opposite, the United Kingdom's output gap with West Germany is less than half that with the United States, and shrinks to one-third when demographic differences have been taken into account. Of the remaining West German advantage, only a part can be attributed to clear and sustainable superiority in productivity performance.

* * *

The main cause of the gap in the UK's output per capita is low labour productivity, which lags behind that of all the comparison countries. In addition, UK companies and investors are injecting less capital into the economy than those in the United States, France and West Germany. The net result is an economy that is some way short of fulfilling its potential.

3. The Root Causes

What, then, are the constraints on labour productivity in the United Kingdom? In our experience, the most robust explanations result from detailed analysis of individual product markets rather than analysis at the macro level. It is in these product markets that the key decisions and judgements that ultimately drive productivity and economic growth are made.

In this study, we have examined in detail six product markets that illustrate different aspects of the United Kingdom's economic profile: *automotive, food processing, food retailing, hotels, telecommunications* and *software*. We have also drawn on evidence from other sectors which we have studied in less depth but know well, including *wholesale and retail banking, insurance* and *pharmaceuticals*.

These case studies confirm that the UK productivity shortfall is not confined to specific sectors. The average level of labour productivity in the product markets we have examined ranges from 50 per cent of the global benchmark (in the automotive and telecoms sectors) to 75 per cent (in food processing and food retailing). The same analysis conducted at the level of total factor productivity tells a similar story *(Exhibit 9).*

In each product market, we have compared the United Kingdom's performance with that of the country that sets the global benchmark. This is not to suggest that simply because the United Kingdom falls behind the best-practice standard, it is necessarily performing badly. In several of our product market studies, we have identified UK companies that are achieving or approaching global benchmark standards. The best automotive plants in the United Kingdom, Japanese-owned transplants, operate at on average around 90 per cent of the productivity benchmark set by Japan, for example *(Exhibit 10).* Moreover, there are market sectors in which even the average UK productivity level sets or approaches the global benchmark, as we have seen with food retailing. Similar success stories can be told in pharmaceuticals and wholesale banking.

Nevertheless, our product market studies do confirm the United Kingdom's overall underperformance in labour productivity, and they go on to identify the operational reasons for it. Taken together, these factors point to a systematic failure by UK companies to adopt global best practice. The question is: what is stopping them?

LOW COMPETITIVE INTENSITY

Conventional wisdom has it that the inexorable tide of globalisation will expose more and more companies to competition from the world's top performers, forcing laggards to adopt best practices in order to raise their performance. In many respects, this is true. Certainly, some of the key traded goods sectors, including relatively new industries such as software, are increasingly global, exerting strong pressure on players to achieve benchmark productivity standards. Previous McKinsey Global Institute work has demonstrated the close link between exposure to global best practice through international trade and transplant operations and product market productivity.

But our study has revealed that in many cases, the level of competition in the United Kingdom is not yet sufficiently intense to force the economy-wide introduction of operational best practices. In key parts of the economy, this may be only a matter of time.

As with most major developed countries, the UK economy is increasingly focused on the provision of services, locally delivered and locally consumed *(Exhibit 11).* As a general rule, physical goods that can be produced in a few locations and consumed anywhere in the world have proved easier to globalise. The globalisation of services, which often requires the creation of an international network of local operations, started later and will inevitably progress more slowly. This helps to explain the prevalence of locally owned service providers in, for example, the hotels and telecoms industries.

Yet our study also shows that the introduction of global best practices in both traded and non-traded sectors is frequently hampered by regulatory constraints on market behaviour, such as trade barriers, pricing restrictions and planning regulations. Such regulations depress the level of competitive intensity. Some limit the pressure on managers to improve their performance; others make the implementation of best practices impossible or uneconomic.

THE REGULATORY BARRIERS

Product market and land use regulations create barriers to the entry of new firms and hinder the domestic expansion of the most productive UK companies. As a result, the best operators tend to focus their efforts elsewhere, on increasing domestic margins or expanding internationally. Because of this, unproductive businesses are able to generate reasonable profit margins and stay in business long after they would otherwise have been forced out.

Consider the impact of regulatory barriers on the sectors covered by our study:

Automotive

Competitive intensity in car manufacturing has been constrained by voluntary trade restrictions that limit Japanese manufacturers' share of the UK and other key European export markets *(Exhibit 12).* These restrictions have encouraged Japanese manufacturers to keep their prices in line with other European producers rather than use their productivity advantage to cut prices and compete for market share. The result has been persistently low productivity in the sector overall and a high price umbrella under which relatively unproductive companies have been able to continue operating with restricted competitive pressure.

Food processing

The Common Agricultural Policy has severely limited the supply of milk to UK dairy producers. Barely enough milk has been available to satisfy the continuing strong demand from UK consumers for liquid milk. As a result, UK dairy producers have faced supply constraints in developing more productive dairy products such as cheese and yogurt. Countries less disadvantaged by regulation have been able to build much stronger and more productive dairy processing industries *(Exhibit 13),* which in some cases now export their produce to the United Kingdom.

Food retailing

Large stores with modern formats, such as supermarkets and hypermarkets, are by far the most productive outlets for food retailing *(Exhibit 14).* Over time, they could be expected to displace smaller traditional stores that are intrinsically less productive. In fact, this has happened less in the United Kingdom than in some other countries. A higher proportion of food retailing still goes on in smaller stores with lower levels of productivity, while even the larger stores are small by international standards *(Exhibit 15).*

The primary reason is that land use and planning regulations make it difficult for large-format operators to develop new sites or expand existing ones. This limits their ability to compete with, and ultimately displace, less productive operators. Consequently, the high levels of innovation exhibited by the top players in areas such as supply chain management and chilled meal development have not spread to other parts of the industry. Leading operators are prevented from achieving their full productivity potential, while new operators are discouraged from entering the market. Few overseas food retailers have extensive UK operations.

Hotels

Strict building codes have prevented the development of a productive hotel industry. Regulations governing land use, planning and building mean that the cost of building or refurbishing a hotel in the United Kingdom is up to 40 per cent higher than in the United States. Higher costs push up the occupancy level that newly built hotels must achieve to break even: in one case study we found that the UK break even occupancy was close to 80 per cent, compared with just 50 per cent for a similar type of hotel in the United States.

Moreover, it is often difficult for a UK hotel operator to obtain permission to build on the sites that offer the best prospects of high occupancy. Not surprisingly, the rate of new hotel openings and refurbishments is relatively low, leaving the country with a large stock of old hotels that are less able to support efficient working practices. Around 3,000 UK hotels are in listed buildings, and nearly 50 per cent are over a hundred years old *(Exhibit 16).*

As a result, the UK hotel industry remains for the most part locally run, with limited inward investment into what amounts to an economically unattractive market. Competitive intensity is consequently low, with little pressure placed on unproductive older operators to exit the market. Indeed, in some cases they have few opportunities to do so, since alternative uses for property are often restricted. High barriers to entry and exit combine to create a vicious cycle. Although the country is home to several of the world's leading hotel operators, much of their investment is going abroad, to countries where they can generate a more attractive return.

Telecommunications

Regulations governing pricing and competition have artificially constrained the productivity of the United Kingdom's fixed telecoms network. The long-standing regulatory emphasis on cheap universal access obliged operators to subsidise low subscription fees with high call charges. (The United States achieved the same social objective by subsidising subscriptions for the needy, thus delivering universal service with much less economic distortion.) Historically, it has cost much more to make a telephone call in the United Kingdom than in the United States, so that UK consumers have learned over a generation or more to limit their use of the telephone *(Exhibit 17).* The result has been much lower network capacity utilisation than in the United States, where cheap or even free calls have boosted telephone usage.

Product market regulations have also limited competitive intensity, even though the UK telecoms market is theoretically open to new entrants. By 1996, some 12 years after British Telecom was privatised, the company still accounted for around 85 per cent of fixed line telephone usage. Part of the reason lies in the fact that competitors were hindered, at least until recently, by restrictions including constraints on number portability and on access to the existing network. The low level of competition has historically provided incumbents with limited incentives to promote demand by creating new value-added services such as freephone numbers or call waiting facilities *(Exhibit 18).*

Software

Planning regulations have even constrained the growth of new high-technology sectors in the IT industry. International experience indicates that these sectors benefit from the clustering together of many small entrepreneurial ventures in close proximity, as in Silicon Valley. But the development of such clusters around Oxford, Cambridge and other natural communities has been slowed or even prevented by local planning restrictions.

In each of these sectors we have observed product market and land use regulations that inhibit the pursuit of productivity improvements. There is compelling evidence that this pattern is widespread across the economy, as other examples suggest:

- The granting of **pharmacy licences** is governed by regulations which effectively control the number and location of pharmacies across the country, creating barriers to entry for more productive players and providing existing pharmacies with a captive market for the sale of non-pharmacy goods.
- **High street banks and other retailers** located in listed buildings encounter difficulties in modernising their branches to improve customer service.
- The complex and constantly changing tax rules governing the **life assurance** industry have fostered product proliferation far in excess of that seen in other countries, and undoubtedly in excess of customer needs. This has led to higher costs and inevitably lower productivity.

In short, these regulations have meant that highly productive companies have been prevented from growing, and less productive companies have been able to stay in business because of high price umbrellas. Furthermore, prospective new players that might have been expected to drive productivity up and prices down have been prevented or discouraged from entering.

THE SPILLOVER EFFECT

The adverse effect of low competitive intensity on productivity extends well beyond specific product markets. McKinsey Global Institute studies show that low productivity in one sector is often a primary cause of low productivity in another:

- **Automotive.** Japanese car makers have transferred highly productive lean manufacturing techniques to their UK suppliers in order to cut costs and improve quality *(Exhibit 19).* But poor practices transfer just as easily from sector to sector. The relatively low productivity of other car manufacturers in the United Kingdom has an adverse effect on the productivity of their supplier networks.

- **Hotels.** Low investment in new properties and refurbishment reduces productivity in the hotel sector. But this low investment is partly the spillover effect of low poor performance in the construction sector, at least some of which can be explained by planning and building codes.

- **Software.** Technology sectors such as software often depend on leading-edge demand in their domestic customer base to drive innovation and the development of products that can achieve global scale. But UK software suppliers have had difficulty generating that kind of demand among customers that are sheltered from competitive intensity and do not have to strive constantly to improve productivity. As a result, the United Kingdom has not proved a source of innovation or productivity in the software industry.

- **Telecommunications.** There is considerable evidence that many of the telephone calls forgone in the United Kingdom because of high prices are business-to-business or consumer-to-business calls – in other words, calls that might have created economic value. An example of the spillover effect from the telecoms sector can be seen in the service businesses that depend on low-cost telephony, such as mail order, electronic commerce and call centres. In the United States, these businesses have flourished; in the United Kingdom, they have been much slower to develop.

MANAGERIAL PRACTICE AND SKILL

The regulatory environment is by no means the only factor to limit competitive intensity and the adoption of global best practices. The macroeconomic environment also plays a part, and the United Kingdom's history of relative economic instability may well have discouraged productivity-enhancing investments in plant and equipment, and especially in new technology.

But in many cases neither regulatory nor macroeconomic factors need prevent managers from adopting best practices. It is often up to them to judge whether to compete intensively on the basis of enhanced productivity, or accept a satisfactory profit margin at lower levels of productivity.

In some sectors, lack of exposure arguably means that market participants are unaware of what constitutes best practice. Yet even in industries where productive international operators have entered the UK market, domestic competitors have often failed to adopt best practices. The Japanese automotive transplants have been achieving near-benchmark productivity for several years, but their success has had little impact on many traditional UK manufacturers. In the absence of strong price-based competition, these companies have had limited incentive to close the productivity gap.

Although it is clearly more difficult for management to push for change in the absence of the kind of external pressure that is exerted by price competition from a more productive player, efforts to do so will almost certainly be rewarded with improvements in productivity, and in many cases, in financial performance too. They will also ensure that UK companies are better able to face up to stiffer competition should the regulatory environment change.

* * *

The labour productivity gap has four root causes. First, low levels of competitive intensity limit the pressure on management to improve. Second, product market and land use regulations prevent the most productive companies from expanding, allow less productive companies to remain in business, and prevent or discourage prospective new competitors from entering the market. Third, spillover effects mean that low productivity in one sector can lead to low productivity in another. Finally, managerial practices can dictate how companies choose to compete and how energetically they strive to improve their performance in the presence or absence of fierce competition.

4. The Secondary Effects

We have diagnosed the United Kingdom’s productivity problem in terms that may seem unfamiliar, and perhaps even contrary. For instance, we have emphasised the effect of product market and land use regulation despite the fact that the United Kingdom is in many respects a highly deregulated economy. Similarly, we have identified barriers to high competitive intensity in sectors such as food retailing even though the battle for leadership in this sector is evidently a fierce one.

Conventional wisdom would tell a different story about the reasons for the United Kingdom’s underperformance. It would talk of the apparent reluctance or inability of UK companies and investors to put their money into productivity-enhancing capital; of the low educational attainment and technical skills of the workforce; and of the scale penalty of operating in a relatively small market.

All of these things – low capital investment, poor skills and sub-scale operations – are undoubtedly factors in the performance of the UK economy. Our sector studies suggest, however, that in most cases they are consequential or secondary effects rather than root causes. If we successfully address the real root causes, then we will be taking major steps towards addressing these secondary effects.

CAPITAL INVESTMENT

It is clear that the United Kingdom does have relatively low capital investment and that this contributes to the labour productivity problem, though it does not account for the majority of it. If the country could close its capital investment gap with the United States without changing the level of its total factor productivity, around one-fifth of the labour productivity gap would be eliminated *(Exhibit 20).*

Conventional wisdom suggests that short-term management thinking leads UK companies and investors to demand an unusually high return on the capital that they do invest. We find the evidence for this inconclusive. Our studies reveal a more compelling reason for low capital investment in the UK economy: a failure to adopt operational best practices. Only if the barriers to their adoption are removed will UK companies and investors find sufficient opportunities to invest in productivity enhancement. Consider these examples from our product market studies:

- **Food processing.** If EU constraints on milk supply were removed, dairy manufacturers could invest in more plants to produce a wider range of dairy products.

- **Food retailing.** If leading food retailers could obtain the sites they want for large modern stores, they would almost certainly invest substantially more and raise both the capital intensity and the labour productivity of the entire sector.

- **Hotels.** If the cost of hotel construction and refurbishment were lower, hotel operators would be encouraged to invest in well-designed new chains that allow the implementation of efficient operating practices.

- **Software.** If there were higher levels of leading-edge demand for IT products and fewer restrictions on cluster development, there would most likely be greater investment in software development.

So there is a strong case for the UK economy to invest more in its capital base. But unless the root causes of its productivity problem are addressed, the impact of increased investment on labour productivity – and thus on economic output – is likely to be limited. If no other changes were made, increasing the level of investment would have a diminishing impact on labour productivity and actually result in a decline in capital productivity, thus generating unattractive returns for investors and savers.

On the other hand, the removal of the barriers to best practice would naturally encourage a surge of investment that would both generate good returns and make a strong marginal impact on productivity. The attractiveness of the investment and its returns would pull in more savings and foreign direct investment, reducing or eliminating the need for government subsidy.

SKILL LEVELS

Low levels of skill in the workforce and in management are commonly held responsible for the United Kingdom’s low productivity. Evidence of relatively limited educational attainment certainly exists, but our study suggests that shortcomings in the skills of its workforce need not prevent the country closing the current productivity gap. Although it is true that it has lower levels of literacy and numeracy than Germany and a smaller proportion of the population with substantial vocational training, it is also true that with a similar educational and vocational profile, the United States manages to achieve high levels of labour productivity *(Exhibit 21).*

The key factors seem to be the development of employer-led training and the design of processes to suit particular levels of skill. There are numerous examples of both domestic companies and foreign-owned transplants making highly productive use of the locally educated and trained workforce in the United Kingdom: for example, the top UK food retailers achieve high productivity by using efficient retail formats and well-designed processes, while Japanese automotive transplants and US hotel operators in the United Kingdom both achieve higher productivity than their UK counterparts *(Exhibit 22).* A recent study conducted by the National Institute of Economic and Social Research supports this argument: it found that the most productive manufacturing locations in the United Kingdom were those that were US owned and therefore had a direct route to understanding and adopting best practices.

Unlike the United Kingdom, Germany has a strong system of vocational training to raise skill levels which partially compensates for any failure to adopt best operational practices. However, our comparison between the United States and Germany suggests that operational best practice is far more important than vocational training in generating high productivity.

Managerial skills are crucial to the development and management of best-practice operations. On the education front, although the United Kingdom has produced relatively few graduates in the past, it now boasts a flow of new graduates comparable with that of the United States. But management expertise relies not just on the quality of the raw material but on the extent to which skills have been honed through exposure to intense competition and best practice. If managerial skills are currently in short supply, a primary way to address them must be to tackle the root causes of low competitive intensity.

SCALE

Scale problems certainly do exist in the United Kingdom. In two of the sectors we studied, food retailing and software, we found that productivity was directly constrained by the relatively small scale of the primary production units.

As we have shown, the average size of individual supermarket sites (but not of supermarket operators) is small in comparison to those in countries with higher sector productivity. The average scale across the whole food retailing sector is smaller still because of the relatively low penetration of supermarkets. The underlying reason for this lack of scale is not a shortfall in demand, but barriers to the adoption of best practices. The removal of these barriers would help to resolve the scale problem.

In packaged software, the absolute volume of sales per product -- the key driver of productivity -- is low compared with that in the United States. However, lack of scale in this sector should not be attributed to the small size of the domestic market. SAP in Germany and Baan in the Netherlands have demonstrated that software producers do not need a huge domestic base in order to develop a successful product that captures global demand.

The United Kingdom's smallness may be affecting performance in other ways. Limits to market size may restrict the number of operators with efficient scale in each industry, making it less likely that new best practices will emerge. Limited geographic scale may account for the emergence of restrictive land use regulation. But low productivity cannot be explained by making a simple link between operating scale and demand.

At the same time, even apparently 'domestic' industries such as food retailing and hotels increasingly compete in a global marketplace for talent, ideas, technology and suppliers. Regulation and competition controls that define the marketplace exclusively in domestic terms will increasingly be an impediment to UK operations achieving relevant scale.

* * *

We believe that low capital intensity, low levels of skill and sub-scale operations all contribute to the United Kingdom's productivity problem. But in many cases, we have found these factors to be not root causes but rather consequences of other constraints.

5. Possible Areas for Action

Reforms to the United Kingdom’s labour and capital markets in the 1980s and 1990s halted what had been a relative decline in the country’s economic performance. But if it is now to improve that performance substantially, it must address the root causes of low productivity. The central plank of any action plan must be a modern framework of commercial regulations, penalties and incentives that overcomes the existing barriers to rapid adoption of global best practices and unleashes latent growth potential. In essence, the United Kingdom needs product market and land use reforms that match and capitalise on the labour and capital market reforms that have already been achieved.

The adoption of such reforms would have a number of direct and indirect benefits. It would allow the best-performing UK companies to expand more rapidly, and create far stronger incentives for new and emerging companies to improve productivity and innovate. At the same time, it would encourage inward investment by international companies that would bring in its wake global best practices and increasing competitive intensity. It would boost the returns from investment in developing physical and human capital, and encourage further investment in high-yielding opportunities. Finally, as each product market improved, there would be a spillover effect into other product markets, creating a virtuous cycle of innovation, improvement and growth *(Exhibit 23).*

Our study points to six areas where action can be taken to improve productivity:

1. Preserve the United Kingdom’s platform of flexible labour markets and well-developed capital markets, and ensure continuing macroeconomic and fiscal stability.

The United Kingdom’s flexible labour markets, well-developed and open capital markets, and increasingly stable macroeconomic and fiscal environment provide a hard-won and solid platform on which to build an adaptable economy *(Exhibit 24).* But there is always a risk that domestic or European policy initiatives will undermine these sources of advantage. They need to be protected and nurtured so that economic growth will not be stifled by labour supply problems, lack of access to capital, weak corporate governance mechanisms or undue macroeconomic or fiscal uncertainty.

This means that policy initiatives must be designed in such a way as to promote – or at least not to jeopardise – the pursuit of productivity-driven growth. In particular, the United Kingdom will need to:

- Ensure that it preserves the existing platform of flexible labour markets and open capital markets.
- Address any inappropriate disincentives to participation in the workforce, such as the underlying causes of the increase of nearly 1 million people claiming disability benefits between 1986 and 1996.
- Adopt a consistent, predictable model of taxation and financial market regulation to allow companies to make long-term commitments with confidence.
- Maintain macroeconomic stability to ensure that excessive volatility in, say, interest rates, exchange rates or levels of domestic demand does not create disincentives to long-term investment.

2. Reform product market and land use regulation.

The core of any attack on the barriers to economic growth in the United Kingdom must be a fundamental reform of the regulations that currently hamper the spread of global best practices. Any such reform should cover both the public and private sectors and will need to have three components:

- Systematic identification of barriers in each product market. Barriers to world-class productivity need to be identified in all major product markets, not just those examined in this report. Once barriers have been identified, a thorough assessment should be made of their economic costs.
- Comprehensive reform of product market and land use regulations. Piecemeal reform will prove inadequate. What is needed is a new regulatory framework that finds a balance between economic and social objectives. That means either meeting the same social objectives at lower cost, or making new social and economic trade-offs.
- Alignment of structural incentives with regulatory objectives. Whatever regulatory objectives emerge, it is critical that those who implement them are given the right incentives. It would be unfair, for instance, to ask local planners to implement a more growth-oriented regulatory regime if their communities were not going to derive any direct benefit from granting planning permission to new developments. Yet unlike many other countries, the current balance of central and local government funding means that local communities derive limited financial benefits from new investment. Furthermore, at national government level, the fragmentation of departmental objectives and responsibilities means that those who design the regulations often have little means of assessing their economic consequences. Similarly, the incentives given to the

regulators of the United Kingdom's formally regulated industries, which account for about 8 per cent of GDP and include many of the privatised utilities, must be aligned with the promotion of economic efficiency.

3. Develop a modern approach to competition.

Our work in the United Kingdom and in other countries studied by the McKinsey Global Institute demonstrates the enormous influence of competitive intensity on the rate of innovation and adoption of global best practices in a sector, and thus on growth in the economy as a whole. There is a strong case for a more robust and focused competitive framework designed specifically to promote economic efficiency, not just prevent abuses of market power. Such a framework would need to take into account the impact of competitor actions on productivity as well as market share.

Several of our sector studies attest that neither productivity nor competitive intensity benefit from restraining productive operators in their efforts to gain share from (or even take control of) less productive rivals. A new competition framework will need to address the productivity challenge facing the United Kingdom by:

- Refocusing the objectives of competition policy on economic efficiency and productivity. This will entail clarifying the primacy of efficiency over other objectives in the exercise of competition policy.

- Strengthening the bodies responsible for enforcing competition rules, and clarifying their roles. These institutions will need to have the resources and authority to investigate all substantial breakdowns in competitive intensity, identify any root causes and devise appropriate remedies.

- Strengthening the mechanisms used to identify inappropriate competitive behaviour and penalise those undertaking it. The impact of a competition framework depends not only on the action it takes to correct abuses of competitive power, but also on the broader incentives it creates for competitive behaviour. A number of mechanisms could be used to this end. Private law suits, which are currently unavailable in the United Kingdom, could greatly increase the information and investigative resources available to the economy, making it more likely that anti-competitive behaviour will be detected or prevented. In addition, increasing the scale of penalties could have a substantial impact on incentives.

The proposed competition bill addresses some but not all of these issues. Its ultimate impact will depend on how vigorously it is executed.

4. Increase exposure to global best practices.

The United Kingdom has the opportunity to build on its advantages of language and location to encourage investment from global best-practice companies. Since about 75 per cent of UK consumption is produced and delivered locally, the presence of such companies is the best way to ensure that consumers obtain the maximum benefit from best practices developed elsewhere. These companies directly increase the productivity of the sectors in which they operate; at the same time, exposure to best practices has a galvanising effect on local operators. Moreover, the spillover effect on the productivity of suppliers and customers and on the depth of the UK skill base can be considerable.

The example of Eire's recent economic growth shows the dramatic effect that the arrival of best practice operators can have on an economy *(Exhibit 25).*

Initiatives that might be taken include:

- Ensuring that all industry players understand what constitutes global best practice, the impact it can have and the actions they must take to close the gap. Government and industry might, for instance, sponsor international benchmarking studies to identify the rate of productivity improvement in the United Kingdom and the causes of any remaining gaps. To the same purpose, companies could throw their weight behind the development of industry forums such as that sponsored by the Society of Motor Manufacturers and Traders, which uses experts to transfer best practices directly from one company to another.

- Ensuring that all sectors are exposed to best-practice operations. In particular, the United Kingdom would benefit from the creation of incentives for overseas companies to start operations in sectors with low productivity, not just in locations with low employment. Under EU regulation, current incentives can address local patches of unemployment, but encourage entry only by those international best-practice companies that can produce their goods or services in a small number of sites. Many service companies whose operations need to be close to consumers are excluded. The economy needs an incentive structure for inward investment that promotes productivity as well as employment.

5. Invest in the capability and flexibility of the working population.

A more highly and more broadly skilled population, particularly in terms of basic disciplines such as problem solving, communication and team work, would be better equipped to take on jobs with high added value. It is on the development of these skills in schools that the government should focus its education efforts. Public investment in specific vocational skills is less obviously needed; indeed, it may not be as effective as employer or employee-led training in a more dynamic economy because of the rate of change in the skills required and the extent to which they are specific to a particular employer.

Flexibility and adaptability in skills will be critical to the creation of an economy characterised by rising innovation. Enabling and even encouraging re-employment with the minimum of friction and cost should be an explicit objective. This calls for public policy that minimises 'stickiness' in employment: for instance, promoting pensions that go with the person, rather than the job.

6. Remove barriers to entrepreneurialism and technological innovation.

Innovation and entrepreneurialism will be critical in the creation of jobs for members of the workforce displaced by productivity-focused strategies in more mature industries. However, the United Kingdom has so far been relatively unsuccessful at developing innovative new businesses. It would benefit from:

- Improvement in the commercialisation of academic research. In the United States, MIT alone has generated nearly half as many entrepreneurial spin-offs as the entire UK university sector. Universities should also modify the content of courses so as to develop more potential high-tech entrepreneurs, for example, by offering combined management and IT courses.

- The development of an educated investor base to ensure the availability of start-up and growth capital for high-technology businesses. The United States has developed a high-technology venture capital sector with deep technical knowledge to enable the market value of new technologies to be assessed accurately. By contrast, the UK venture capital sector has traditionally focused on mature businesses and is less skilled at evaluating new enterprises *(Exhibit 26).* Companies' access to venture capitalists with the necessary skills could be improved by, for example, encouraging US transplants to set up in the United Kingdom or by establishing closer links with the US industry, perhaps through a trade embassy in Silicon Valley.

- Successful start-up investment also relies on a liquid exit market. Europe lacks an exit market for start-up companies to rival NASDAQ, which is now recognised as the leading global market for high-tech companies, offering the highest valuations and the greatest liquidity. Rather than looking to create a European market of similar strength, efforts may be better expended in ensuring that UK companies have free access to NASDAQ.

- The removal of the barriers to the formation of natural 'clusters' of entrepreneurial ventures through changes to planning regulations. Such clusters act as a magnet for talent and reduce the costs of dealing with suppliers (of both goods and ideas), investors, competitors and customers.

* * *

This is a formidable array of challenges, made more complex by the fact that EU legislation drives much UK regulation. Improvements in productivity and economic growth of the order we believe possible will take some years to materialise, and will be difficult to maintain in the longer term as the gap with global best practice closes. To move rapidly to a higher rate of growth, the United Kingdom needs to take action on several fronts simultaneously. Some of the effects will be felt immediately; others will take much longer to come through.

In the **short term**, the United Kingdom can promote growth by sustaining and building on its existing strengths: labour market flexibility, well-developed capital markets and macroeconomic stability.

Boosting growth over the **medium term** calls for the early implementation of a modern framework of regulation and competition that will remove many of the barriers to the adoption of global best practices and ensure the current productivity gap is rapidly closed.

Finally, maintaining a higher level of growth in the **long term** will require the economy to become the *source* rather than the *recipient* of global best practices. A highly competitive marketplace operating at the cutting edge of existing best practices will act as a solid foundation. However, the United Kingdom must also begin to invest now in building the capability and flexibility of its workforce and nurturing a new culture of entrepreneurialism and technological innovation.

What will success look like? Numerically, it will be reflected in levels of output per capita that exceed projections, underpinned by rapid growth in productivity in all or most of the key product markets. In qualitative terms, a thriving economy will be characterised by a flexibility in labour and capital markets that is matched by intense competition within key product markets. A cadre of skilled managers, honed by competing against best practice, will pursue productivity and innovation as the drivers of competitive advantage. Leading-edge customers will demand the highest-quality goods and services from their suppliers at the lowest cost, and will be able to satisfy many of their needs within the United

Kingdom. And finally, fuelled by higher disposable incomes and lower prices, consumer demand will rise, boosting growth and encouraging further innovation.

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WEST GERMANY AS A BENCHMARK

Much of our analysis seeks to explore the reasons for the differences in economic performance between the United Kingdom and the United States, the global benchmark in terms of productivity and output per capita. But it is also important to understand the causes of the output per capita gap with West Germany, which although no longer a country in its own right, has for many years been regarded as the leading European economy.

In the market sector, UK output per capita lags that of West Germany by about 20 per cent. Although the two countries exhibit similar levels of labour inputs, the United Kingdom also trails in labour productivity by about 20 per cent *(Exhibit 8).*

Labour inputs

At first sight, there is little difference between the two countries' labour inputs in terms of hours worked per capita, which suggests that the output gap can be explained simply by differences in labour productivity. However, closer scrutiny reveals that West Germany does enjoy an advantage in having 6 per cent more of its population of working age. If the United Kingdom had a similar demographic structure, the 20 per cent output gap would fall to about 16 per cent.

Labour productivity

The 20 per cent labour productivity gap between the United Kingdom and West Germany is the result of three factors:

- **Relative size of manufacturing base.** West Germany has a larger manufacturing sector than the United Kingdom: it accounts for around 30 per cent of market sector labour inputs, compared with 20 per cent in the United Kingdom. Manufacturing workers have been shown empirically, on average, to be more productive than service sector workers. This difference explains roughly one-tenth of the labour productivity and output gaps. West Germany's slower shift to a service-based economy is at least partly a reflection of concerted efforts by its government to protect the country's manufacturing employment base. It is not clear how sustainable this policy will be in the future.

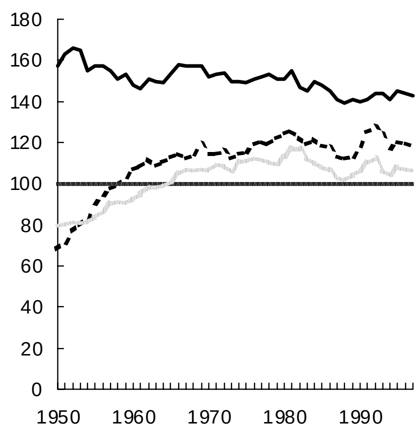
- **Labour--capital mix.** West Germany has invested over 35 per cent more capital per unit of labour input than the United Kingdom. This difference accounts for about half of the gap in both labour productivity and output. However, in the absence of other changes (in other words, assuming that total factor productivity remains constant), the United Kingdom would see a 20 per cent drop in capital productivity were it to adopt the German labour--capital mix. Indeed, West Germany exhibits lower capital productivity on its invested capital than the United Kingdom (which in turn lags the United States), and it appears to have earned lower financial returns. To emulate the West German labour--capital mix in isolation would thus seem to be expensive, inefficient and, as capital markets globalise, increasingly unsustainable.

- **Performance in individual market sectors.** A stronger performance in individual market sectors in West Germany explains the remaining 40 per cent of the labour productivity gap. This can chiefly be ascribed to a combination of higher levels of vocational skill, a higher value-added mix (itself partly due to the higher skill base) and lower employment of low-skill and low-wage workers. However, this performance advantage is partly offset by the United Kingdom's higher labour inputs after adjustment for differences in demographics, and so accounts for only one-fifth of the gap in output.

Exhibit 1

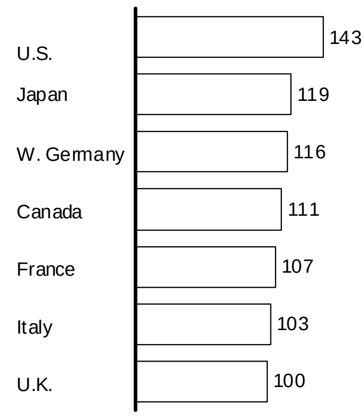
U.K. ECONOMIC PERFORMANCE

Historic GDP/capita*
Indexed to U.K. = 100



	Average annual growth rate, % 1950–85	1985–96
U.S.	2.6	1.4
W. Germany	5.5	1.4
France	4.4	1.6
U.K.	2.8	2.0

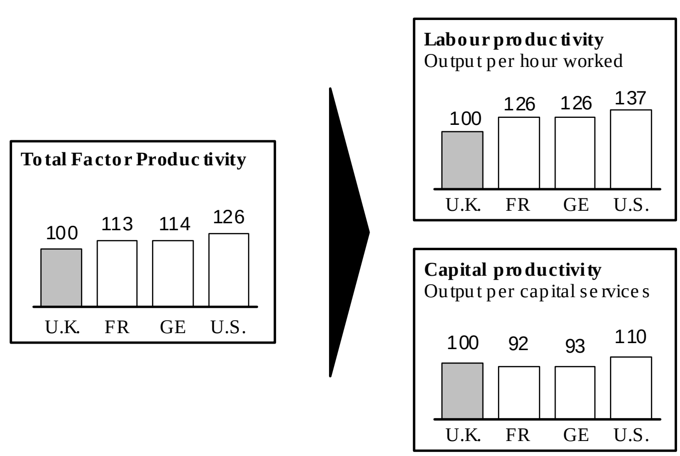
GDP/capita* of G7 countries, average 1994–96
Indexed to U.K. = 100



* Converted at OECD GDP Purchasing Power Parity
Source: OECD; McKinsey analysis

Exhibit 2

MARKET SECTOR TOTAL FACTOR PRODUCTIVITY, 1994–96
Indexed to U.K. = 100

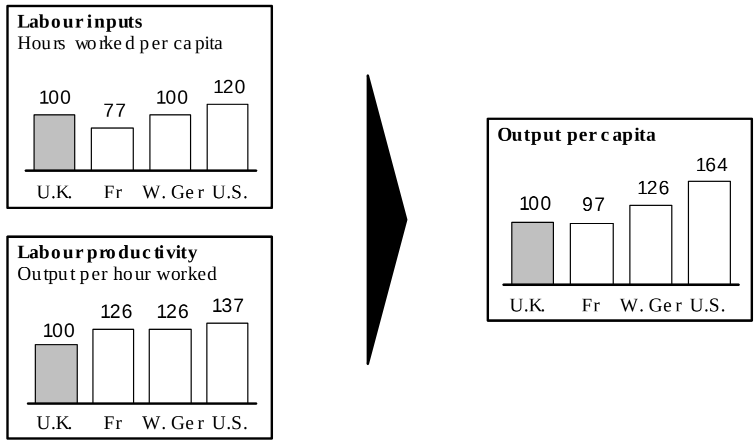


Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; O'Mahony; McKinsey analysis

Exhibit 3

MARKET SECTOR OUTPUT* PER CAPITA, 1994–96

Indexed to U.K. = 100



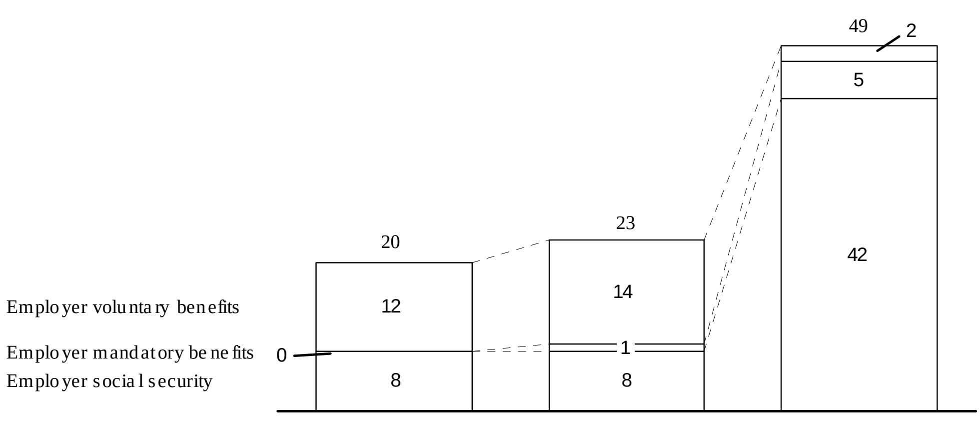
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities; market sector does not include government services, health and education

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey analysis

Exhibit 4

EMPLOYER COSTS OF LABOUR*

% of average employee's wages



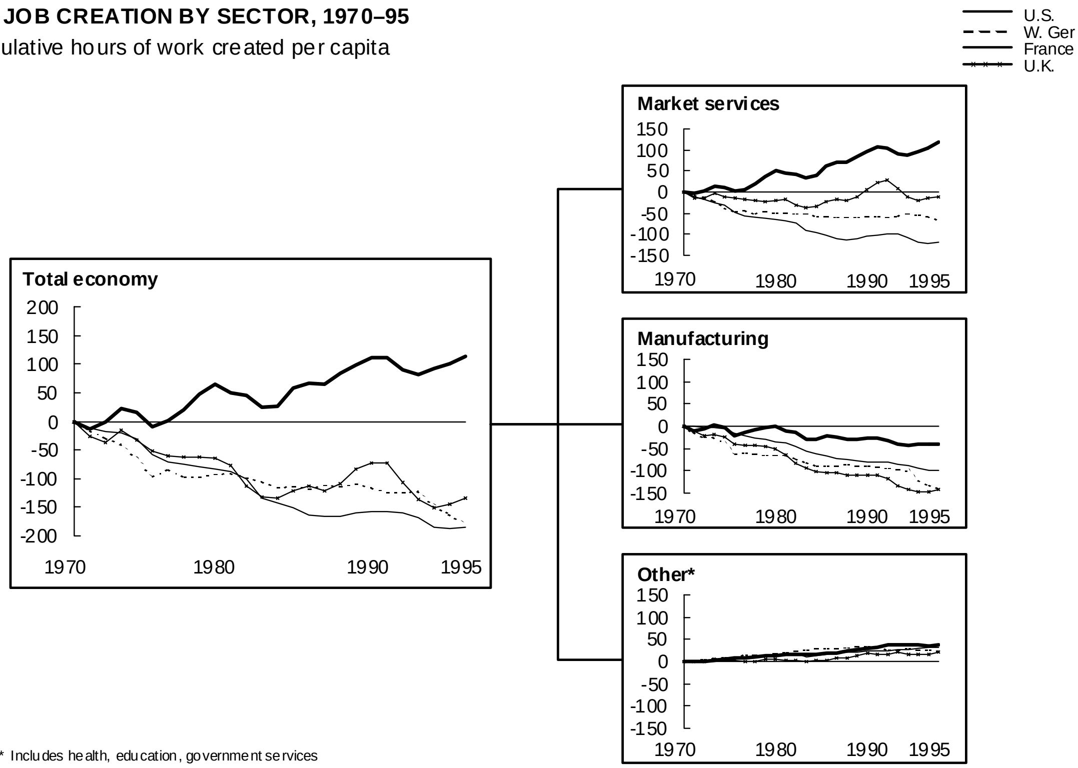
* Based on full-time male employees on national average earnings

Source: Sedgwick Noble Lowndes; McKinsey analysis

Exhibit 5

NET JOB CREATION BY SECTOR, 1970–95

Cumulative hours of work created per capita



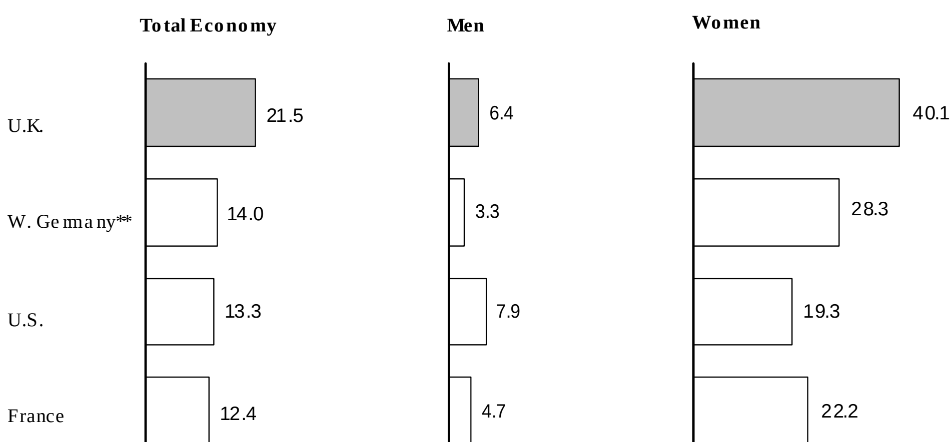
* Includes health, education, government services

Source: ISDB; OECD; National statistics; McKinsey analysis

Exhibit 6

PART-TIME EMPLOYMENT* AS A PROPORTION OF TOTAL EMPLOYMENT, 1994–96

%



* Defined as usually working fewer than 30 hours per week; includes both market and non-market sectors

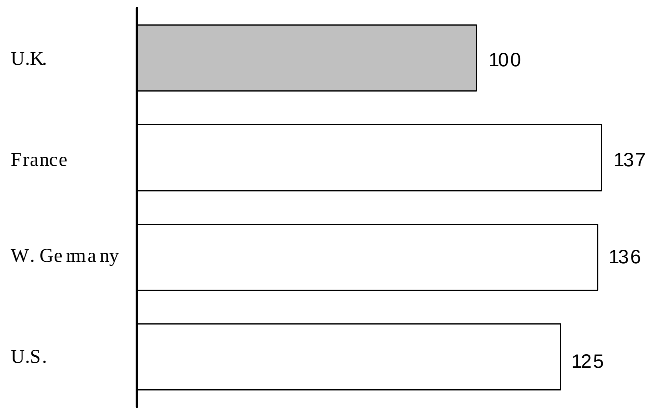
** Data series ends in 1995; 1996 assumed to be the same

Source: OECD Employment Outlook; McKinsey analysis

Exhibit 7

MARKET SECTOR CAPITAL INVESTMENT* PER HOUR WORKED, 1994–96

Indexed to U.K. = 100



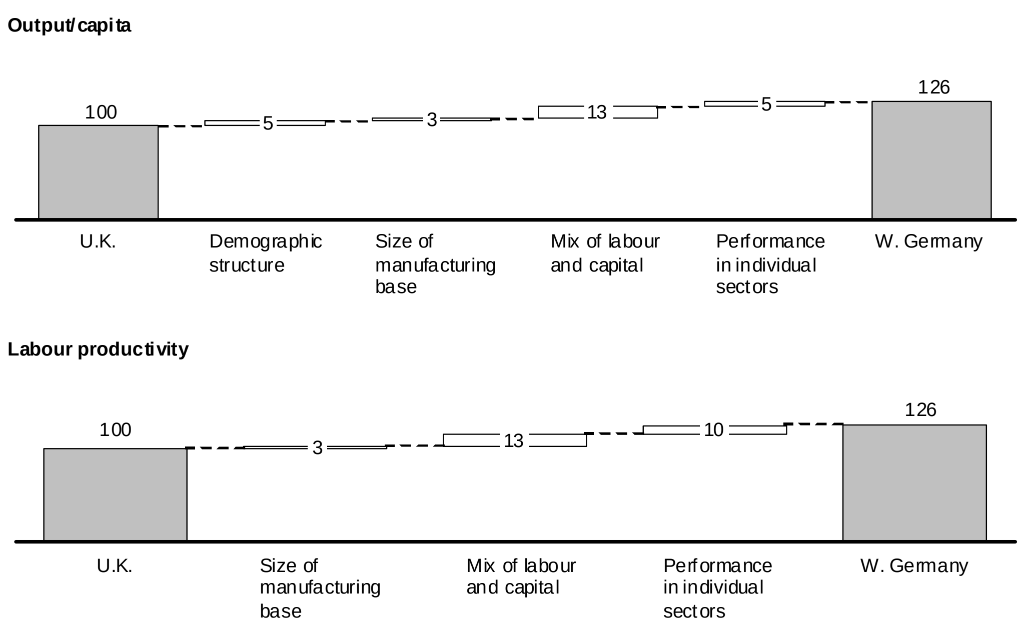
* Calculated using normal service lives for structures and equipment

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; O'Mahony; National sources; McKinsey analysis

Exhibit 8

RECONCILING U.K. AND WEST GERMAN ECONOMIC PERFORMANCE

Indexed to U.K. = 100



Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey analysis

Exhibit 9

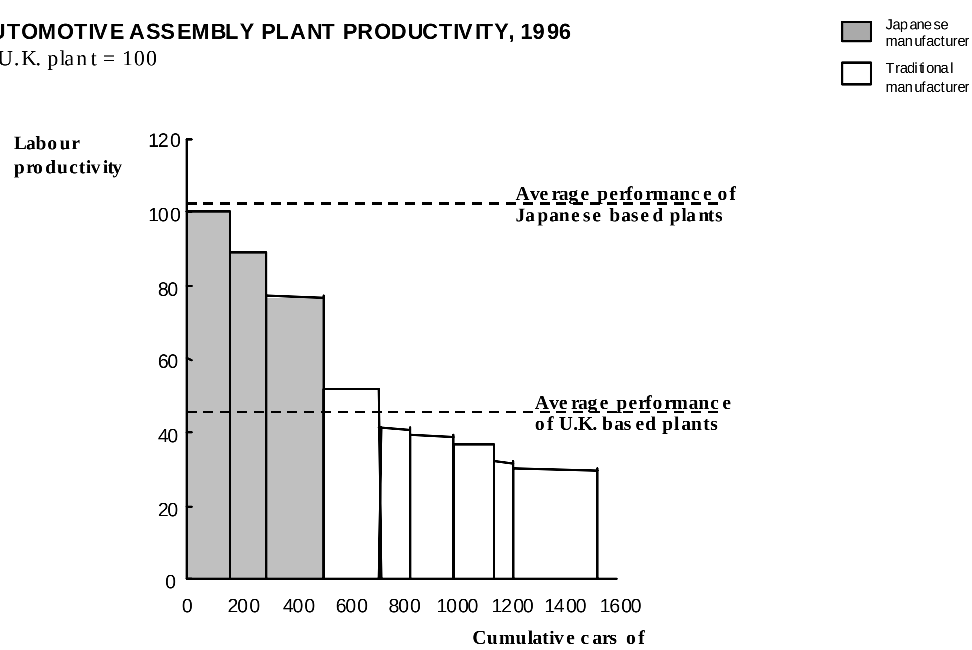
PRODUCTIVITY BY SECTOR

Category	Sector	Relative labour productivity (benchmark country = 100)	Relative total factor productivity (benchmark country = 100)	Benchmark country
Manufacturing	Automotive	50	55	Japan
	Food processing	75	80	U.S.
Services	Food retailing	75	100	France, U.K.
	Hotels	55	n/a	U.S.
	Telecommunications	50	60	U.S.
	Software	70	n/a	U.S.
	Weighted average for cases	**67**	**n/a**	**U.S.**
	Total market sector	**73**	**79**	**U.S.**

Exhibit 10

U.K. BASED AUTOMOTIVE ASSEMBLY PLANT PRODUCTIVITY, 1996

Indexed to best U.K. plant = 100

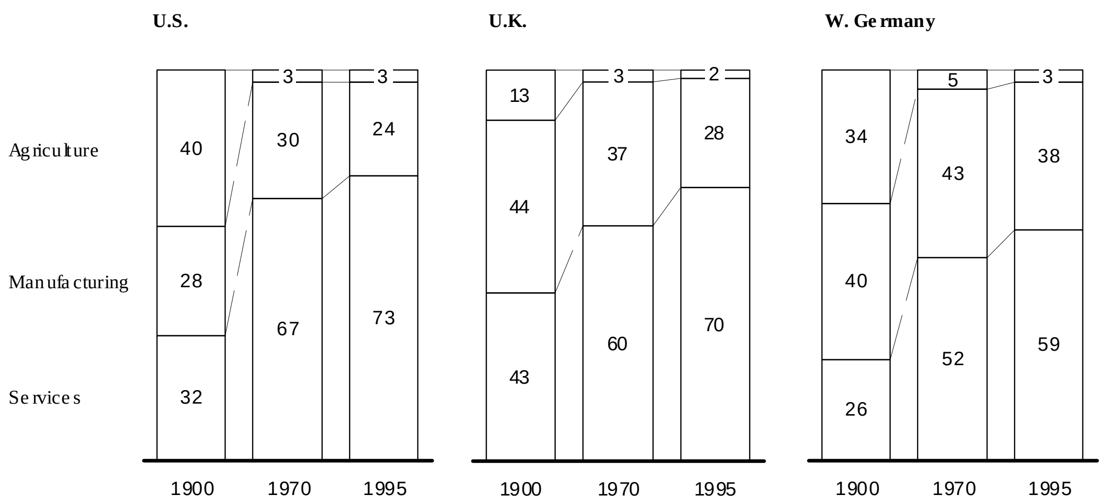


Source: EIU data; company accounts; DRI data

Exhibit 11

STRUCTURE OF EMPLOYMENT, 1900–95

% of total

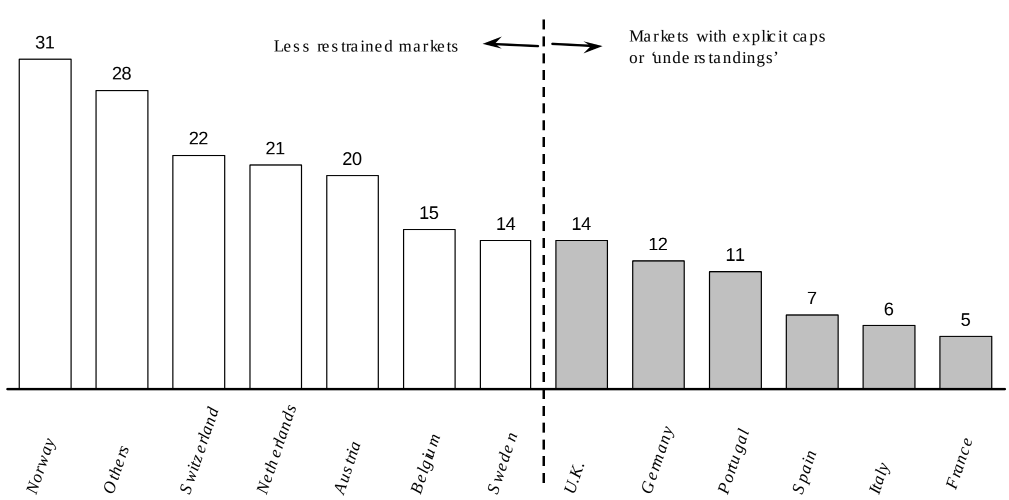


Source: OECD Employment Study

Exhibit 12

JAPANESE AUTOMOTIVE MANUFACTURER MARKET SHARE, 1997

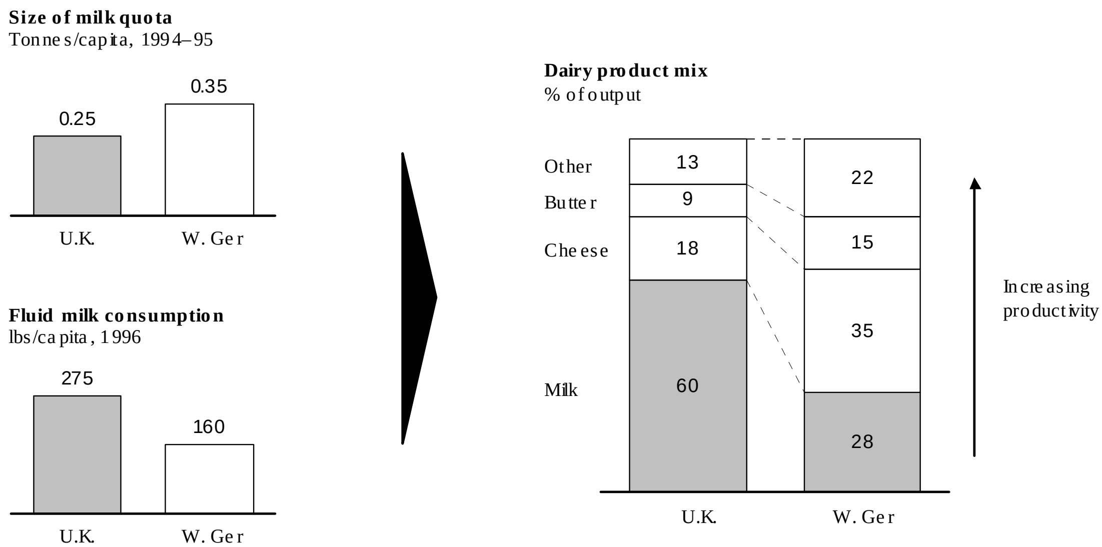
%



Source: DRI world car industry report; EU documentation

Exhibit 13

MILK QUOTAS AND DAIRY PRODUCT MIX

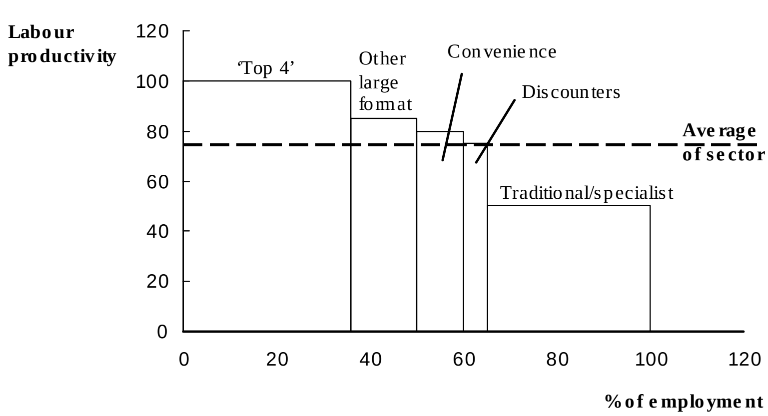


Source: EU Dairy Facts and Figures; OECD; Census of Manufacturers

Exhibit 14

PRODUCTIVITY IN U.K. FOOD RETAILING, 1996

Indexed to 'Top 4'* = 100



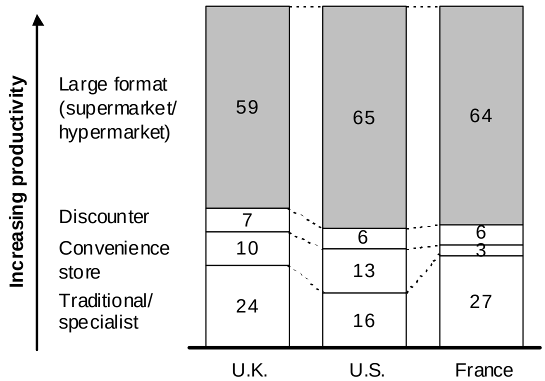
* Asda, Safeway, Sainsbury and Tesco

Source: IGD; Verdict; SDA 25; Annual reports; McKinsey analysis

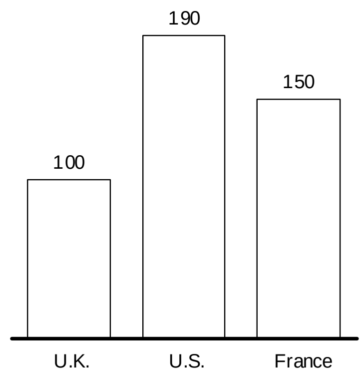
Exhibit 15

FOOD RETAIL INDUSTRY STRUCTURE, 1996

% of turnover by format



Average size of large format food retailer*
Indexed to U.K. = 100



* Adjusted to remove space of non-food items

Source: AC Nielson; SDA 25; INSEE; Verdict; NACS; Census Bureau; Progressive Grocer; company accounts; Atlas LSA; McKinsey analysis

Exhibit 16

AGE OF HOTEL STOCK, 1998

% of rooms

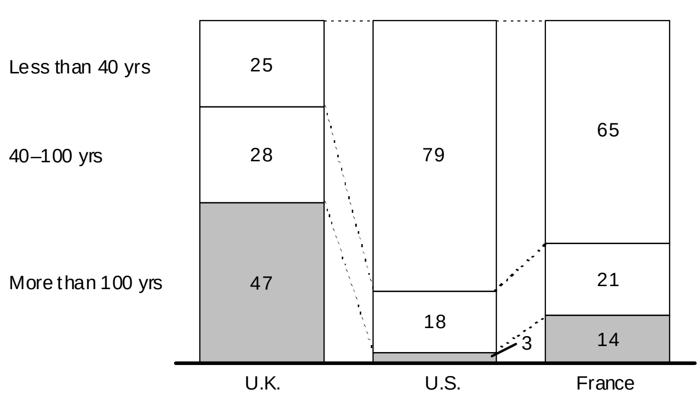
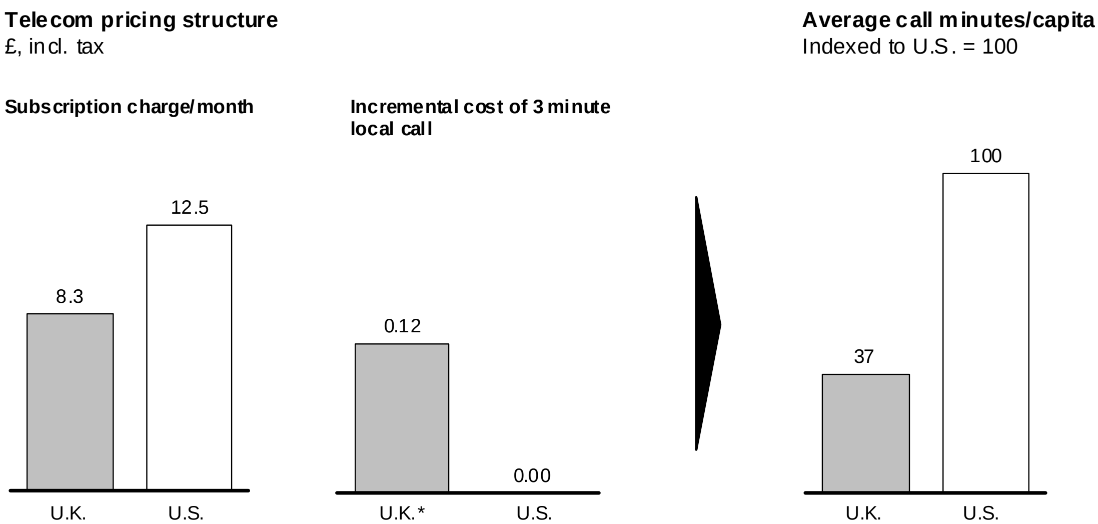


Exhibit 17

TELECOM PRICING STRUCTURE AND USAGE, 1995

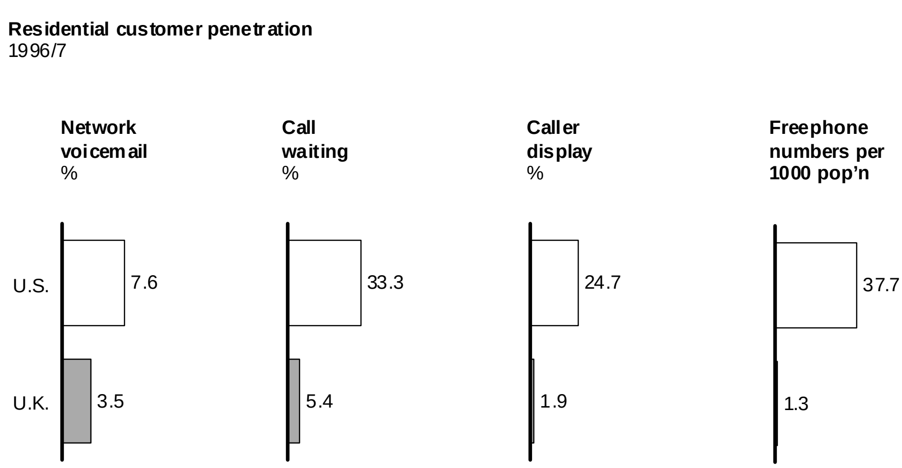


* Cost of peak tariff

Source: Tarifica; FCC; ITU; OFTEL; CCMI

Exhibit 18

PENETRATION OF VALUE ADDED SERVICES IN TELECOMS

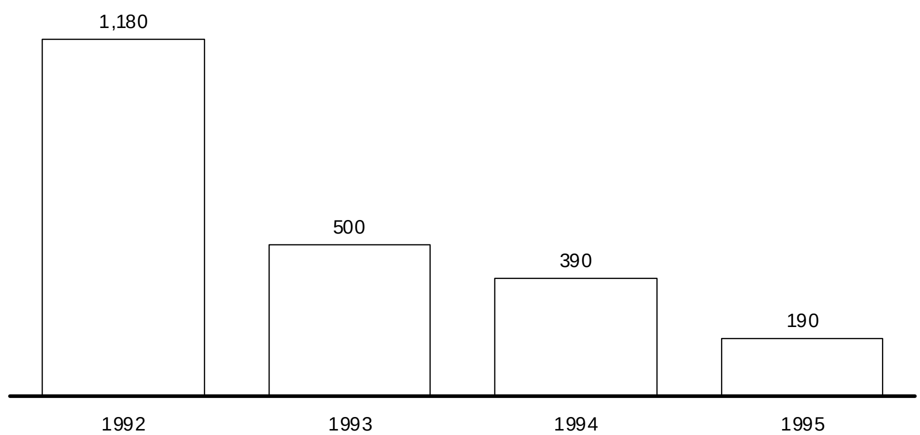


Source: OFTEL; IDC; OECD; Dataquest; OMSYC

Exhibit 19

QUALITY IMPROVEMENTS IN NISSAN U.K. SUPPLIER BASE

Rejected parts per million

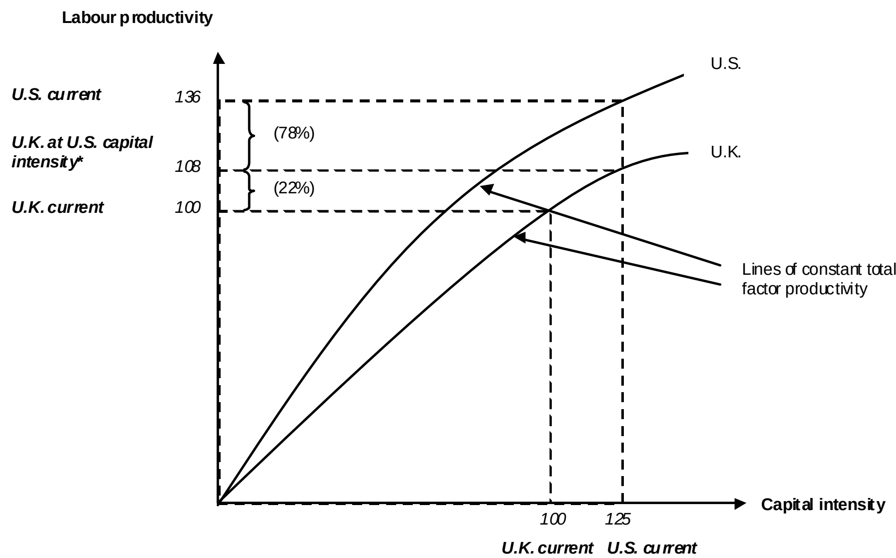


Source: Automotive News Europe; Nissan U.K.

Exhibit 20

EFFECT OF INCREASING U.K. CAPITAL INTENSITY

Indexed to U.K. = 100



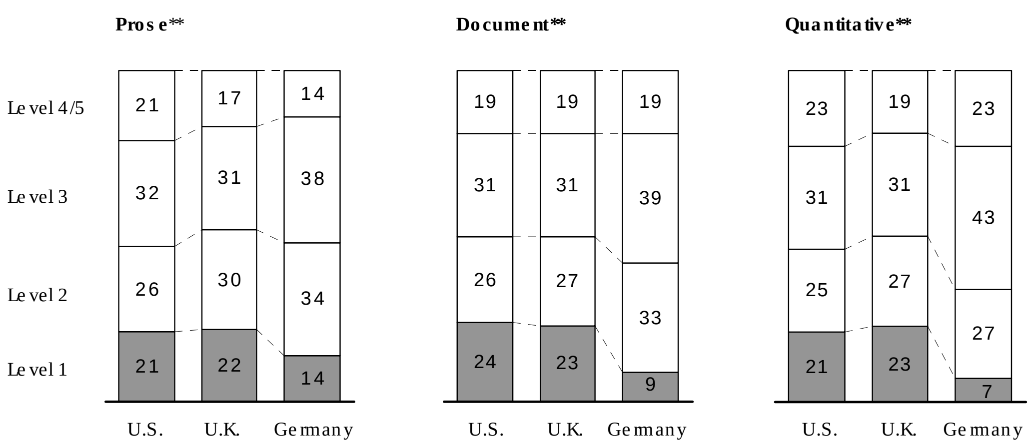
* Assumes same total factor productivity as current U.K.

Source: OECD National accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey analysis

Exhibit 21

BASIC LITERACY SCORES BY SKILL LEVEL*

% of respondents in skill level



* Tasks grouped into 5 'levels'; level 4/5 is highest ranking

** Prose refers to understanding and using information contained in texts; document refers to using information presented in forms such as charts; quantitative refers to basic mathematical operations

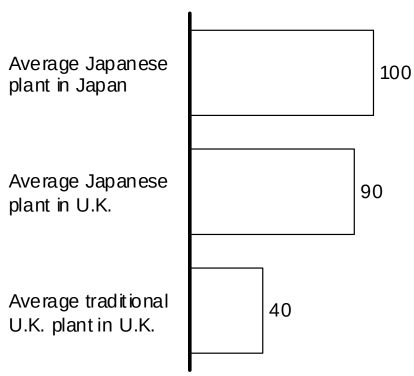
Source: International Adult Literacy Survey, 1994-95; McKinsey analysis

Exhibit 22

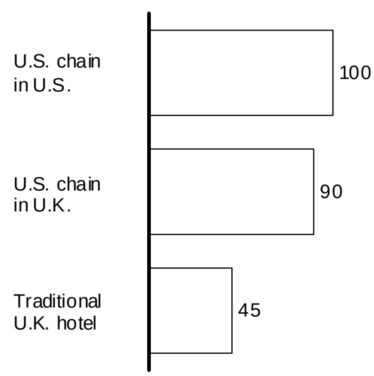
SCOPE FOR BEST PRACTICE MANAGEMENT

APPROXIMATE

Labour productivity in auto sector
Indexed to average Japanese plant in Japan = 100



Labour productivity in hotels sector
Indexed to U.S. chain in U.S. = 100



Source: McKinsey analysis

Exhibit 23

VIRTUOUS CYCLE CREATED BY ADOPTION OF GLOBAL BEST PRACTICES

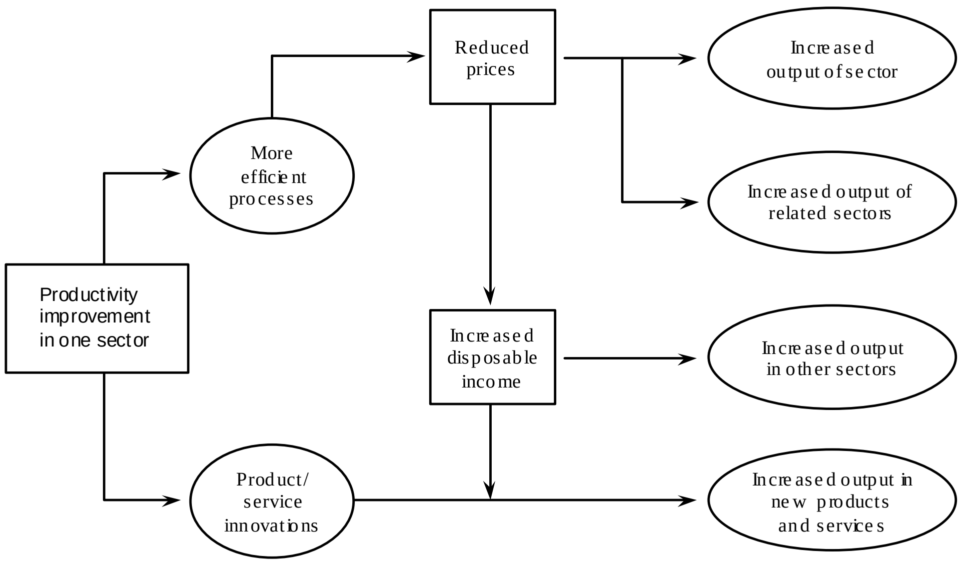


Exhibit 24

RELATIVE FLEXIBILITY OF LABOUR AND CAPITAL MARKETS

	U.K.	U.S.	Germany	France
Labour markets				
• Minimum real wage costs per hour* (1995, U.S.$ at GDP PPP)	No minimum wage****	5.1	10.5***	9.3
• Labour force participation rate (1996, %)	75	77	69	67
• Flexibility of hiring and firing (1993, 0 = low; 10 = high)**	8	7	4	4
Capital markets				
• Stock market capitalisation (1995, % of GDP)	130	100	25	32
• Financial services trade balance (1996, $b)	8	3	3	0
• Sophistication of financial markets (1993, 0 = low; 10 = high)**	8	8	7	6

* Total cost (gross minimum wage plus social charges paid by employer) adjusted for statutory differences in hours paid to hours worked

** Results from executive survey

*** No national minimum wage in Germany; figure shown represents collectively agreed minimum wage in retail industry in Hamburg for low skilled occupations

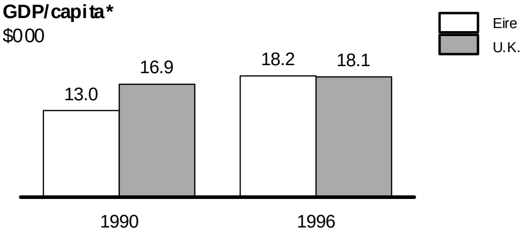
**** The U.K. will bring in a minimum wage of £3.60 per hour from 1999

Source: World Competitiveness Report; World Labour Report; INSEE; LBS; OECD Employment Study

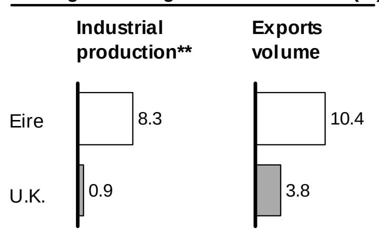
Exhibit 25

GROWTH OF EIRE ECONOMY

GDP/capita*
$000



Average annual growth rate 1990–96 (%)



* At 1990 price levels and exchange rates
** Manufacturing, utility and mining output

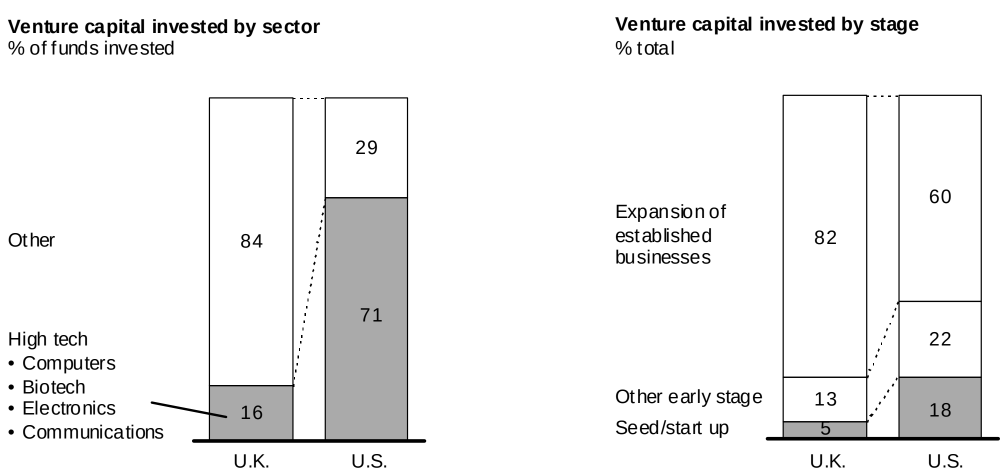
Source: OECD; Press clippings

Growth through foreign direct investment (FDI)

- Active encouragement of FDI through preferential tax rates (e.g., 10% in manufacturing sector) in particular in software, telecom and financial services – e.g.,
  - – 40% of U.S. software investment in EU goes to Eire
  - – 25% of European call centres located in Eire
  - – 'International Financial Services Centre' in Dublin is most rapidly growing offshore fund management centre in Europe
- Growth in fixed asset FDI/GDP of 60% over last decade with total investment of nearly $3b since 1990; multinationals now account for 75% of manufacturing exports, 55% of manufacturing output
- Export led growth from FDI companies now creating 'spillover' growth into domestic economy – e.g, tripling of number of hotel rooms in Dublin, strong growth in luxury shops and restaurants

Exhibit 26

VENTURE CAPITAL INVESTMENT, 1996



Source: Venture Economics Review; BVCA

Objectives and Approach

During the mid nineteenth century, the UK had the highest output per capita of any country in the world. Since then it has slowly lost this leadership position: first the US moved ahead around the turn of the century, then West Germany and France around 1960, and Japan and Italy during the past two decades (Exhibit 1). Despite extensive liberalisation of capital and labour markets in the 1980s, the UK has been unable to turn the trend towards catching up. Today the UK lags behind the US in its GDP per capita by about 30 per cent and West Germany by about 15 per cent (Exhibit 2).

OBJECTIVE OF THE STUDY

The purpose of this report is to shed light on the extent of and the reasons for the UK's output and productivity gap relative to today's leading economies. While we start with an aggregate survey, the main focus of our work is to build a microeconomic understanding of performance differences through six detailed sector case studies. We first benchmark the productivity performance of UK industries relative to the best performing economies in the world. Then we seek to understand the key barriers to productivity improvements and, consequently, to output and employment growth in each sector. This allows us to draw conclusions on the actions needed to improve the UK's economic performance in the future.

We believe that productivity growth is the key determinant of GDP growth. More efficient use of resources to create value allows the economy to provide lower cost goods and services relative to the income of domestic consumers and to compete for customers in international markets. This in turn raises the nation's material living standards. We also believe that productivity growth can and ought to be the key determinant of higher profitability (see Box 1: Productivity and Profitability). To start this virtuous circle leading to higher standards of living and improved profitability, we seek to identify concrete actions that the Government and businesses can undertake to raise productivity in different industries.

The UK's past economic performance has been the focus of many studies in both academic literature and the popular press. Frequently cited causes for low levels of output are insufficient investment caused by a short term perspective of investors and/or a lack of venture capital, a skill gap in the UK labour force, and a lack of entrepreneurial tradition. What seems to be missing is a systematic evaluation of the relative importance of the explanatory factors. Furthermore, the bulk of the literature has looked at the UK's performance from the macroeconomic perspective. This report aims to complement the literature with a systematic analysis of the relative importance of determinants of productivity at the industry level.

The emphasis of our work is on economic fundamentals that determine the UK's economic prospects in the medium and long term. We do not address the short-term macroeconomic factors that may affect economic performance at any given moment. In drawing policy implications from our findings, we bear in mind that higher material living standards are only one of many policy goals that a government can have, but still reflect our belief that higher productivity and output levels provide the opportunity to use resources to address social challenges more effectively.

APPROACH OF THE STUDY

The approach used in this study is based on the methodology used in previous McKinsey Global Institute (MGI) reports. Industry case studies form a core that is complemented by analysis of aggregate data and review of relevant literature.

Aggregate analysis

The first chapter is a diagnostic of the UK's past economic performance based on aggregate data and relevant literature. Through a comparison with the US, West Germany, and France, we explore the current understanding of the main factors that have contributed to the UK's past productivity, output and employment performance in its market economy. The potential causal factors identified in the aggregate analysis form part of the hypotheses that are tested in the case studies.

Sector case studies

The core of the research project is six detailed industry case studies. Analysing sectors individually allows us to understand how UK operations differ from world benchmarks and the reasons for the different choices UK managers have made. Only through this microeconomic understanding of industry operations are we able to draw conclusions on the relative importance of the external factors affecting managers' decisions.

Our sectors are selected to represent a significant share of the market economy (Exhibit 3). The automotive and food processing cases represent tradable manufacturing sectors, with automotive being a more mature industry. Telecommunications represent a sector with strict government regulations. Among the service sector cases, we studied food retailing and hotels as examples of traditional service industries, and computer software as one of new technology-driven services.

Each of the sector cases follows the same sequential analytical process that starts with a measurement of the UK industry's current productivity level relative to world benchmarks (see Box 2: Interpreting Global Productivity Benchmarks). Then we generate and test hypotheses on the causal factors that explain the observed gap.

¶ **Measuring productivity.** Productivity reflects the efficiency with which resources are used to create value in the marketplace. It is measured by computing the ratio of output to input. We first define each industry in a consistent manner in the UK and the comparison countries, making sure that our industries include the same parts of an industry value chain. We then collect data on each sector's output using measures of physical output or Purchasing Power Parity adjusted value added. The labour inputs are measured as number of hours worked, and capital inputs, when available, as capital services obtained from the existing stock of physical capital (see Appendix 1: Measurement of Output and Productivity).

¶ **Generating and testing causality hypotheses**. To explain why levels of productivity in the UK differ from the benchmarks, we start by generating a set of hypotheses on the possible causes. In this phase, we benefit from McKinsey's experience by using interviews with McKinsey consultants who are experts in the field, industry associations and company executives in both the UK and the comparison countries. This has proved a very efficient way of identifying major operational differences and how differences in product, capital and labour market conditions cause them.

We use a systematic framework to explain productivity differences across countries that captures the major possible causal factors. This causal framework has three hierarchical layers of causality: differences observed at the production process level, factors arising from industry dynamics, and external factors that explain why the choices of UK companies differ from those in the comparison countries (see Appendix 2: Framework Definition).

The hypotheses are tested with further fact based analyses and plant visits that allow us to conclude with an assessment of the relative importance of the causal factors in explaining the productivity difference in each sector.

Synthesis

Having identified the causal factors for each industry, we compare the results across industries. The patterns that emerge allow us to draw conclusions on the causes of the aggregate productivity gap between the UK and the comparison countries, as well as on the level to which productivity can rise when the external factors are changed.

Appendix 1: Measurement of Output and Productivity

Productivity reflects the efficiency with which resources are used to create value in the marketplace. We measure productivity by computing the ratio of output produced in a year to inputs used in that production over the same time period.

Output

For output, we use two basic measures: physical units and value added. Physical output is the preferred measure, because it most closely reflects the productivity measure we are interested in. However, it is not always feasible to compare physical output due to product variety and quality differences. This approach also requires data from the same part of the value chain in every country; in some countries an industry may simply assemble products while in others it may produce them from raw materials. Physical measures would tend to overestimate the productivity of the former, as fewer inputs would be required to produce the same amount of output. We used physical output measures in one of our case studies: telecommunications.

An alternative approach to physical output is to use value added. This is the approach taken in the remaining case studies: automotive, food processing, food retail, hotels, and computer software. Here value added is defined roughly as factory-gate gross output less purchased materials and energy. The advantage of using value added is that it accounts for differences in vertical integration across countries. Furthermore, it accommodates quality differences between products, as higher quality goods normally receive a price premium that translates into higher value added. One complication arises from the fact that value added is not denominated in the same currency across countries. As a result, this approach requires a mechanism to convert value added to a common currency using Purchasing Power Parity (PPP) exchange rates, a topic which is discussed separately below.

GDP can be seen as a value added concept of output. In many cases, output is not homogeneous; the GDP of a country is made up of many thousands of different goods and services. The GDP of a country is the market value of the final goods and services produced. It reflects the market value of output produced by means of the labour and capital services available within the country.

Purchasing Power Parity (PPP) exchange rate

To convert value added of different countries to a common currency, we use PPP rather than market exchange rates. PPP exchange rates can be thought of as reflecting the ratio of the actual costs of purchasing the same basket of goods in local currencies in two countries. The PPP exchange rates are constructed 'bottom up' by comparing the actual market prices of comparable goods and services across countries, and then aggregating the individual prices up to a 'price' for sector-specific baskets and finally the total GDP.

The reason for not using the market exchange rate is that because it reflects international transactions alone, it cannot reflect the prices of non-tradable goods and services in the economy. Furthermore, comparisons made on the basis of market exchange rates would be affected by fluctuations in the exchange rate resulting from, say, international capital movements. For our aggregate survey and most of our cases, we use PPP exchange rates reported by the OECD.

Inputs

Our total factor inputs consist of labour and capital. Labour inputs are the more straight forward to measure: we seek to use the total annual number of hours worked in the industry. When actual hours are not available, we estimate labour inputs by multiplying the total number of employees by the best available measure of average hours of work per employee in the sector.

The heterogeneity of capital makes measuring capital inputs more difficult. Capital stock consists of various kinds of structures (such as factories, offices, or stores) and equipment (such as machines, trucks, or tools). The stock is built up incrementally by the addition of investment (business gross fixed capital formation) to the existing capital stock. Each piece of capital provides a flow of services during its service life. The value of this service is what one would pay if one were leasing this piece of capital and this is what we use as our measure of capital inputs.

We construct our capital service measures using the Perpetual Inventory Method (PIM), based on US service lives for structures and equipment. Ideally we would have liked to measure the capital inputs in each of our case studies as well. However, capital data was available for only the cases of automotive, food processing and telecommunications; in food retailing we used selling space as a proxy for capital inputs.

Appendix 2: Framework Definition

The framework for synthesising the explanatory factors for the productivity performance in each industry is summarised in Exhibit 5. The various elements of the framework are further described below. Illustrations of possible effects are also presented under some of the subheadings, both in order to facilitate the understanding of the relevance of each point and in order to introduce some of the effects that are presented in the later discussions.

External factors

The external effects on managers can be divided into fiscal and macroeconomic environment, product, labour and capital market factors, and others. These factors are mainly outside the control of firms but influence how they operate.

¶ ***Fiscal and macroeconomic environment.*** The general economic environment in which managers operate affects their planning horizon, investment decisions, and their everyday operational decisions. High productivity is more difficult to achieve in an unstable macroeconomic environment where high inflation rates, uncertainty about exchange rates, or frequently changing fiscal policies generate additional uncertainty.

¶ ***Product market***

- **Trade/FDI barriers.** Tariff and non-tariff barriers to trade or foreign direct investment (FDI) can reduce the competitive pressure on an industry and allow low productivity to persist.

- **Product regulations.** Regulations prohibiting or discouraging certain product or service offerings (including regulations on pricing) can reduce or eliminate high-productivity production. Product market regulations can also limit or distort competition by protecting or favouring incumbent companies.

¶ ***Labour market***

- **Labour rules/unionism.** Labour regulations and union policy can influence the possibility to implement productivity improvements. In addition, the work rules and compensation schemes supported by national law may increase or decrease the possibility of putting in place certain types of production processes. These differences may thus generate different constraints and incentives for managers.

- **Relative labour cost.** Differences in relative prices of capital and labour lead profit-maximising managers to choose different production technologies. This in turn leads to labour and capital productivity differences, although not total factor productivity differences, across economies.

- **Education.** Managers and frontline workers in one country may have lower levels of education or a different educational focus (discipline / skills) than those in other countries. This may cause managers to be less effective in any of marketing and selecting the mix of products / services to be offered, deciding on production factors and designing operations. Alternatively it may lead to lower frontline skills / trainability. In either case this would lead to lower productivity.

¶ ***Capital market***

- **Corporate governance/Government ownership.** The extent to which management is exposed to pressure from owners or shareholders can influence the rate at which productivity is improved. Ownership by government may imply management objectives that differ from profit maximisation and lead to a lower productivity in favour of other goals.

- **Access to capital.** Small or new companies in the UK may have fewer or more costly sources of financing than similar companies in comparison countries.

¶ ***Other external factors***

- **Other industries/up and downstream.** Supplier or downstream industries can influence productivity by exposing a national industry to international competition, by exerting buyer / seller power and by providing technical support. An underdeveloped upstream industry in turn can impose significant productivity costs on its clients.

- **Country specific factors**. The UK and its comparison countries may differ in the structure of consumer demand they face as a result of varying climate, income distribution, or traditional consumption patterns. This influences the product mix demanded in the marketplace, which in turn can affect the value of the total output and thus productivity.

Industry dynamics

The competitive pressure in the industry influences the pressure on management to adopt best practices in the production process. We consider differences arising both from competition among domestic firms and from the exposure of an industry to best practice either via imports or foreign direct investment.

Production process

The third set of factors affecting productivity arises at the production process level. These can be grouped into mix of output / demand among different products and services, availability and application of key production factors (capital, scale, and labour with various skills), and organisation of production operations. Production process factors in the framework are jointly determined by elements of a firm's external environment beyond its control and decisions made by its managers, although the three factors classified as "operations" are most directly under a firm's control.

¶ ***Mix of products and services/marketing***

- **Product category mix.** Countries may differ in the categories of products they specialise in (e.g. milk or cheese in dairy), and a productivity penalty can arise if a country's output consists of a higher share of inherently less productive product or service categories.

- **Value added within category.** Within product categories, countries may differ in the quality of products they produce. Producing higher value added products or services with similar levels of inputs is reflected in higher productivity.

- **Product proliferation**. Given that larger scale helps productivity, a wide range of product or service lines can reflect a sub-optimal product mix that reduces productivity.

- **Pricing structures/marketing.** Differences in pricing structures and marketing can help productivity through incentivising consumers to alter demand patterns and so improve the capacity utilisation of fixed infrastructures.

¶ ***Production factors***

- **Capital intensity/technology.** We use capital in the sense of physical assets and their embodied processes (e.g., machines, plants, buildings, and hardware). Capital can influence productivity in two different ways. If an industry works with a higher capital intensity, i.e., uses more capital in combination with each unit of labour, we expect that this industry would show higher labour productivity. Or productivity gaps may be explained by differences in the types of machinery and equipment used, when we refer to differences in technology.

- **Scale.** Higher production scale is generally expected to lead to increased productivity.
- **Frontline skills/trainability.** This factor captures any possible labour productivity penalties due to lower frontline skills or trainability potentially caused by lower educational levels, different educational focus (discipline / skills) or less frontline worker motivation.
- **Matching capacity to demand.** Where companies invest in extra capacity without an associated increase in demand, productivity falls as a result of lower capacity utilisation.

¶ ***Operations***

- **Organisation of functions and tasks.** This is a broad category encompassing the way in which production processes and other key functions (product development, sales, marketing) are organised and run. It reflects managerial practices in most areas of the business system.
- **Design for manufacturing.** Both within the manufacturing sectors and in services, design can influence which technology might be applied. Design changes might simplify the production process and improve productivity.
- **Suppliers and supplier relationships.** Suppliers can contribute to industry productivity by efficient delivery processes, by collaborating in product development or by providing components that are easier to assemble.

Box 1

PRODUCTIVITY AND PROFITABILITY

Within any given market, a firm that is more productive will enjoy higher profitability, unless it suffers from some other source of cost disadvantage. A more productive firm will either produce the same output with less inputs and thus enjoy a cost-advantage, or produce better output with the same inputs and thus enjoy a price-premium.

Over time, the higher profitability of productive firms will attract competition. As competitors catch up in productivity, profitability will tend to converge. In such an environment, the only way a firm can enjoy higher profitability is by pushing the productivity frontier beyond its competitors. If, as a result, the firm achieves higher productivity, it will enjoy higher profitability only until its competitors catch up again. In another words, profitability, in a dynamic world, is a transient reward for productivity improvements.

While a more productive firm will enjoy higher profitability within a given market, this may not be true for firms operating in different markets, for two reasons. First, higher cost of inputs may deem a productive firm in one market unprofitable, while a less productive firm in another market with lower cost of inputs may be profitable. For example, a German firm may be more productive but less profitable than a UK firm because German wages are higher. Second, competitive intensity may differ across markets so that a productive firm in a highly competitive market may be less profitable than an unproductive monopolist or oligopolists in another market. For example, in the 1980s European airlines enjoyed higher profitability than their more productive US counterparts because they faced much less price competition.

However, deregulation and globalisation are eliminating distinctions between national markets. As barriers are removed, productive firms will enter markets with unproductive incumbents. This could take the form of exports if the goods are traded. While cheap input prices may temporarily shield unproductive incumbents in the importing country, those input price differences are not sustainable in the long-run. The cost of capital (a key input price) is converging internationally, and wages (the other key input price) will eventually catch up with productivity (so that no country can enjoy both low wages and high productivity in the long-run). The other form of market entry for productive firms is foreign direct investments. In this case, productive transplants will face the same input prices as unproductive incumbents, and will therefore enjoy higher profitability.

In sum, as markets liberalise and globalise, the only sustainable source of higher profitability for a firm will be to continually raise productivity higher than its competitors.

Box 2

INTERPRETING GLOBAL PRODUCTIVITY BENCHMARKS

To assess the performance of the UK industries, we compare their average labour and capital productivity with those of the best performing countries in the world. This benchmark allows us to measure how efficient UK companies are in the production process relative to their potential. The use of comparison countries allows us also to identify the reasons for the productivity gap through a detailed comparison of production process and other business practices between the UK and the benchmark country.

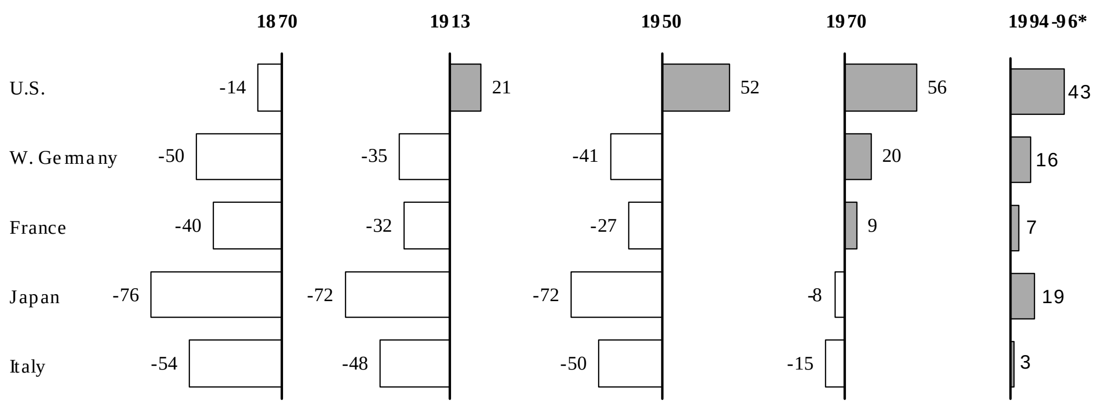
The global benchmarks should not be perceived as a measure of maximum possible productivity level however. At any moment of time, there are individual companies with productivity levels above the average of the best performing country. And over time, the global benchmark rises as individual companies continuously improve their productivity (Exhibit 4). So while the benchmark productivity level can be interpreted as a realistically achievable level of efficiency, it should not be seen as a limitation.

Independent of the global benchmark for any specific sector, we have chosen to express all of our productivity measures in consistent units defined relative to the US average productivity level. The US has the highest real income level in the world, which makes it the benchmark for the level of total GDP per capita. While this is not the case for several industries, we believe that using a consistent benchmark unit helps the interpretation of productivity gaps in individual industries and facilitates performance comparisons across them.

Exhibit 1

GDP PER CAPITA RELATIVE TO THE U.K.

%



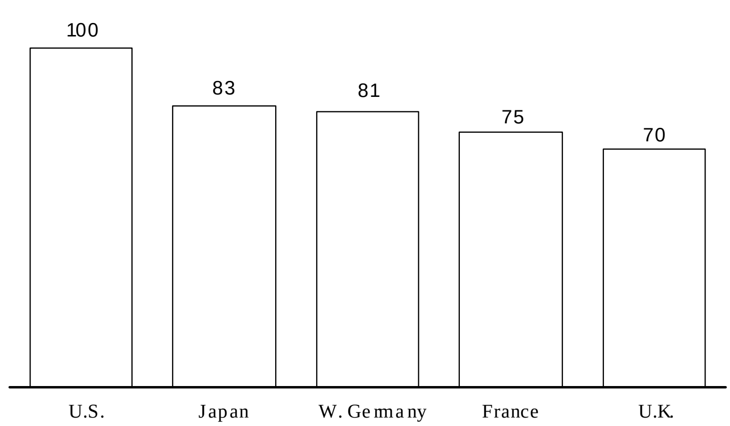
* Numbers may differ from OECD because of modified output and PPP

Source: Maddison (1991); OECD National Accounts; McKinsey analysis

Exhibit 2

GDP PER CAPITA*, 1994–96

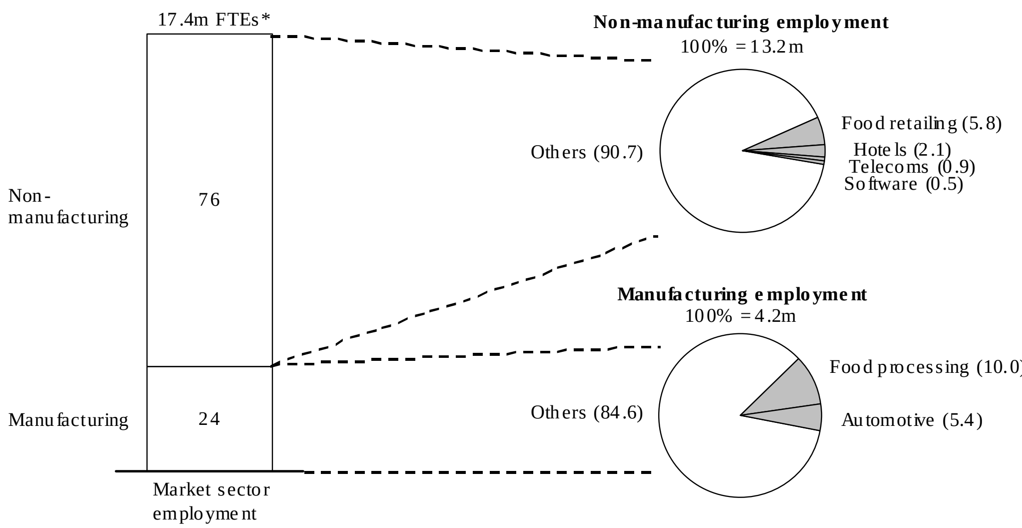
Indexed to U.S. = 100



* Total economy at PPP exchange rates; numbers may differ from OECD because of modified output and PPP

Source: OECD National Accounts; McKinsey analysis

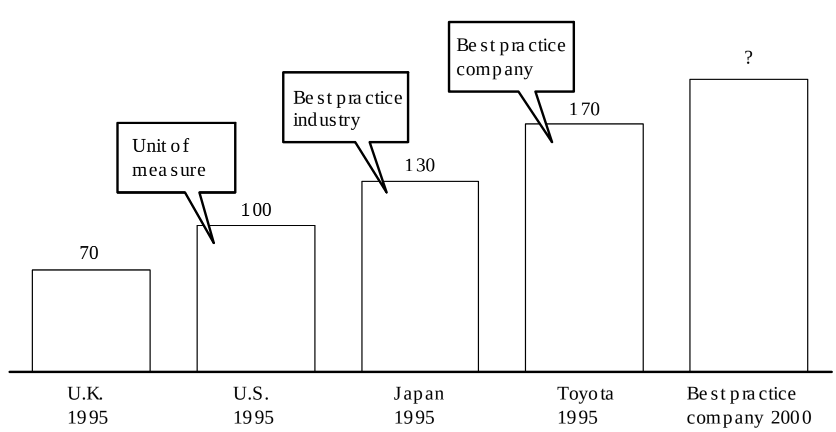
Exhibit 3
EMPLOYMENT COVERAGE OF OUR INDUSTRY CASE STUDIES, 1995



* Full-time equivalent workers
Source: OECD National Accounts; Employment Survey

Exhibit 4
INTERPRETING GLOBAL PRODUCTIVITY BENCHMARKS: LABOUR PRODUCTIVITY IN AUTOMOTIVE SECTOR
Indexed to U.S. 1995 = 100

EXAMPLE



Source: McKinsey analysis

Exhibit 5

CAUSALITY FOR PRODUCTIVITY DIFFERENCES

External factors

- **Fiscal and macroeconomic environments**
- **Product market**
  - Trade/FDI barriers
  - Product regulations
- **Labour market**
  - Labour rules/unionism
  - Relative labour cost
  - Education
- **Capital market**
  - Corporate governance/government ownership
  - Access to capital
- **Other external factors**
  - Other industries/up and down stream
  - Country specific factors

Industry dynamics

- **Competition with best practice**
- **Domestic competitive intensity**

Production process

- **Mix of products and services/marketing**
  - Product category mix
  - Value added within category
  - Product proliferation
  - Pricing structure/marketing
- **Production factors**
  - Capital intensity/technology
  - Scale
  - Frontline skills/trainability
  - Matching capacity to demand
- **Operations**
  - Organisation of functions and tasks
  - Design for manufacturing
  - Suppliers and supplier relationships

Aggregate Analysis

INTRODUCTION

To understand overall UK economic performance and to identify key unresolved issues to explore further in our case studies, this chapter benchmarks UK macroeconomic performance against the US, France and West Germany. We use aggregate data and economic literature to explore what appear to be the principal causes of output and productivity gaps between the UK and these comparison countries.

It is worth noting that we tread very little new ground in this aggregate analysis. All of the data is publicly available, and much of it has been analysed numerous times by academics. However, the aggregate analysis is vital to scope the problems that need exploring at the sector case study level – where the McKinsey Global Institute can do original research and bring a unique perspective to the debate.

By combining the aggregate work with the sector case study findings, we can draw conclusions on the main causes of output and productivity performance in the UK, as well as assess the likely impact of removing barriers to productivity growth. The findings of the aggregate analysis and the sector case studies are presented in the synthesis chapter of the document.

UK ECONOMIC PERFORMANCE AT THE AGGREGATE LEVEL

We chose to compare the UK's economic performance with that of the US because the US is the leading economy in current aggregate productivity and output. We also chose to compare the UK's performance with that achieved by West Germany and France because they follow somewhat different economic models and are the European leaders in output and productivity.

The UK has the lowest output per capita of the four comparison countries, trailing the US by 30 per cent at the level of the overall economy, with similar gaps in almost every large segment of the economy. Output per capita can be disaggregated into the amount of labour employed (or total hours worked per capita) and the productivity of that labour (or output per hour worked). The principal driver of poor UK economic performance is low labour productivity, which explains about two-thirds of the UK's relatively low output. Workers in the US, France and West Germany add about 25 to 35 per cent more value per hour worked than those in the UK. UK labour inputs trail the US by more than 15 per cent, which explains the remaining portion of the output gap with the US, although the UK's labour inputs are similar to those in West Germany and well above those in France.

Output comparisons

The best available aggregate measure of the material living standard of an economy is its gross domestic product (GDP) – or output - per capita measured in purchasing power parity (PPP) terms. To calculate comparative GDP figures across countries we start with OECD data and then make adjustments based on individual countries' national accounts and other sources (see Appendix for more details on the sources and methodology used for the aggregate analysis). Thus our results differ somewhat from other published results that have been based solely on OECD data. Using this methodology we find that the UK's overall output lags other leading industrialised countries, and the UK has not improved its relative position substantially in the past 50 years.

- **The UK has the lowest output per capita of the Group of Seven industrialised countries**, trailing the US by about 30 per cent, and West Germany by about 15 per cent (Exhibit 1).
- **This output gap is not a recent phenomenon**. In fact, the UK has barely closed the output gap with the US over the last 50 years, and during that time both France and West Germany's outputs have surpassed that of the UK (Exhibit 2).

This study focuses specifically on the "market sector," which excludes government services, provision of health care or education. Output or value-added in these sectors is, in many cases, measured by adding up input costs, and therefore does not reflect output and productivity differences in any meaningful way.

Within the market sector we find that the UK output gap is even wider than the overall GDP gap, and we find some evidence of the UK marginally improving its relative position over the past 25 years.

- **The gap between the US and the UK is even wider in the market sector[1]**. Output per capita in the market sector trails the US by almost 40 per cent, and West Germany by about 20 per cent. However, there is no significant difference[2] between France and the UK in the market

[1] Market sector output is compared by using a constructed PPP, based on OECD PPPs.

[2] Given the uncertainty surrounding National Accounts and PPPs, the perspective of the McKinsey Global Institute is that differences are only truly statistically significant if they are greater than 10.

sector (Exhibit 3). This is true in both the manufacturing and market services sub sectors of the market sector:

- *In manufacturing*, the UK's output per capita trails the US by about 40 per cent and West Germany by almost 45 per cent.

- *In market services*[3], UK output per capita is 40 per cent lower than US output per capita, although in this sub sector the UK compares more favourably to the continent, trailing West Germany by less than 10 per cent and leading France by about 10 per cent.

¶ **The UK has closed the market sector output gap slightly over the past 25 years**. The growth rate of the UK's market sector over the last three business cycles has been marginally higher than the US' and West Germany's. The 1980s cycle was the period of most significant convergence, with the UK's market sector output per capita growing almost a percentage point faster than that of the US (Exhibit 4).

¶ **Despite recent convergence, the gap remains substantial**. The UK's output in the market sector in 1996 is still remains below the US' output in 1970. If the UK managed to grow one per cent faster annually than the US, it would still take more than 50 years for UK market sector output to reach parity with the US.

Labour productivity comparisons

In the **market sector**, UK labour productivity trails all three countries by more than 20 per cent, and trails the US by almost 30 per cent. This low labour productivity is the primary cause for lower output per capita, and hence, a lower material standard of living (Exhibit 5). This is true in both the manufacturing and market services sub sectors of the market economy.

¶ The labour productivity gap in the **manufacturing sector** is similar to the overall market sector pattern. The UK trails the US by about 30 per cent, it trails France by about 25 per cent, and it trails West Germany by around 20 per cent (Exhibit 6).

¶ In the **market service sector**, the pattern is consistent – UK productivity trails the US, France and West Germany by more than 20 per cent (Exhibit 7).

Since 1970, the UK has been slowly narrowing the labour productivity gap with the US, although the gaps with France and West Germany have widened (Exhibit 8). The UK only recently reached the same level of labour productivity that the US reached in 1970. Common wisdom holds that labour productivity increases

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[3] Market services also includes agriculture, construction, utilities, and mining.

in France and West Germany are partly a function of these countries displacing their labour with capital, which we can only truly ascertain at the industry case study level. The UK has also seen an overall drop in hours worked per capita since 1970, but the decrease has been much more moderate than in France, and, unlike West Germany, which has also experienced decreasing hours worked per capita, there has been an upswing in the UK in recent years.

A possible reason for the UK's relatively low labour productivity is the low level of invested capital. Capital intensity, which measures how much capital each worker has to work with, is significantly lower in the UK.

¶ **The UK has low capital intensity**. Capital intensity in the UK market sector is about 20 per cent below the US, and about 30 per cent below France and West Germany. This capital intensity gap is similar in the manufacturing and market service sectors (Exhibit 9).

¶ **Low capital intensity is not a function of a different "mix" in the UK.** Low capital intensity in the UK could simply be a function of the UK having more labour in sectors that have low capital intensity (such as retail) than the US. However, capital intensity is lower in each individual sector in the UK (Exhibit 10). In fact, if the UK were to have the US' labour mix, it would have even lower capital intensity.

¶ **The UK has low levels of both structures and equipment**. The average UK worker has roughly 25 per cent less equipment to work with than his or her counterpart in the US. While the gap between the UK and US is smaller in structures (about 10 per cent), the equipment intensity gap between the UK and West Germany is significantly larger (Exhibit 11).

Labour inputs comparison

The UK employs 17 per cent fewer hours than the US in the market sector and 19 per cent fewer in the total economy. Part of this is attributable to differences in incentives to work as determined by labour market conditions and regulations. It may also be a function of differences in choices about how many hours to work – the so-called "labour-leisure trade-off", although it could be argued that this trade-off is similar across the two countries, but that the US is providing more economically attractive employment opportunities than the UK.

The UK is widely regarded as having significantly more flexible labour markets than France or West Germany, and this flexibility is partly captured in cross-country comparisons of hours worked per capita.

¶ **Market sector** labour inputs in the UK are much higher than in France, and about the same level as West Germany. However, as shown later in Exhibit 13, West Germany has a demographic advantage over the other countries studied in that a higher proportion of its total population is of working age, which inflates total labour inputs. Hours worked per capita in the market sector in the UK are about 30 per cent higher than in France (Exhibit 12).

¶ West Germany uses significantly more labour hours in **manufacturing** than any of the other comparison countries, with about 30 per cent more hours than the US. Employment per capita in manufacturing in the UK is about 10 per cent lower than in the US.

¶ The UK has been somewhat successful in creating jobs in the **market services** sector, which is particularly important as market services continue to be the source of most of the growth in the developed world. Employment in market services is about 35 per cent higher in the UK than in France and about 15 per cent higher than in West Germany.

Labour inputs do not appear to be the main reason for the UK's low output per capita, but the UK still works 19 per cent fewer hours per capita than the US in the total economy. Hours worked per capita can be broken down to four component parts:

¶ **Working-age population** as a percentage of total population, which is a function of demographics.

¶ **Total employed** as a percentage of working-age population, which is a function of both the participation rate (i.e., the percentage of working age people who actually seek employment) and the employment rate (i.e., the percentage of those people seeking employment who find it).

¶ **Full-time equivalents** as a percentage of total employed, which is a function of the part-time rate.

¶ **Hours worked** per full-time equivalent, which is a function of legislated holidays and choices about working hours.

The UK's labour input gap relative to the US is driven by three main factors – a lower ratio of total employed to working-age population, a lower ratio of full-time equivalents to total employed, and fewer hours worked per full-time equivalent worker (summarised in Exhibit 13).

¶ **Lower ratio of total employed to working age population**. The portion of the working-age population that is employed in the UK is about 10 per cent below the US, driven by higher overall unemployment and a lower participation rate among older workers.

- Although the UK unemployment rate has been decreasing over the latest economic cycle, the standardised unemployment rate is still 2 per cent higher than the US (Exhibit 14). This may be due, at least in part, to a slightly higher level of unemployment benefits in the UK.

- The participation rate of 55 to 64 year-olds is about 10 per cent lower than in the US, although it is higher than in West Germany and France (Exhibit 15). One of the drivers of this lower participation rate may be that more older workers are claiming disability benefits rather than continuing to seek work (Exhibit 16). The number of people in receipt of disability benefit has increased threefold over the last 20 years to nearly 2 million. People in receipt of disability benefit are no longer required or helped with seeking re-employment. The UK also has higher social benefits for people who are long-term unemployed or over 60 years old, the point at which women currently become eligible for a state retirement pension. Another explanation may be a choice by UK workers in receipt of occupational pensions linked to final salary and in receipt of substantial severance payments to retire early.

¶ **Lower ratio of full-time equivalents to total employed, driven by higher part-time rate, especially among females.** The percentage of workers working part-time is higher in the UK than in the US, France or West Germany. The difference is particularly prevalent among female workers – more than 40 per cent of female UK workers work part-time (Exhibit 17). The UK national insurance payment system encourages the use of part time workers, in that it makes them cheaper to employ. When asked in a survey, more than 80 per cent of part-time female workers said they worked part time out of choice. However this choice may well be affected by factors such as the cost and availability of childcare in the UK.

¶ **Fewer hours worked per full-time equivalent.** The average worker in the UK works about 7 per cent fewer hours than the average worker in the US. However, workers in the UK work more hours than their counterparts in France and West Germany.

POTENTIAL CAUSES FOR LOW UK LABOUR PRODUCTIVITY

The UK's low labour productivity and subsequent low output have puzzled experts. The UK has carried out many of the things conceived as being "right" by economists, including having flexible labour markets, deregulating capital markets and privatising state-run companies. However, despite these actions, there still is a significant, albeit slowly closing, gap between UK and US economic performance. In evaluating external causes for low labour productivity at the aggregate level, we have looked at four main areas: capital markets, labour markets, product markets, and other external macroeconomic factors.

Capital markets

It is clear that UK workers have less capital than their counterparts in the US, France and West Germany. UK consumers save less, and business and government investment is also significantly lower than in other countries:

¶ **The UK saves less than other countries.** Gross domestic savings[4] are lower in the UK than in France, the US, West Germany or Japan (included here as an example of a high savings country). While the UK's "savings rate" – or percentage of GDP that is saved – is about the same as France and the US, the absolute level of savings is lower because the UK has a lower GDP (Exhibit 18).

¶ **The pattern and uses of savings are different in the UK.** Households and businesses save significantly less in the UK than in West Germany, the US and Japan. More of the UK's savings come from net international inflows, including foreign direct investment, portfolio investments, and loans. However, the borrowing from abroad still does not compensate for the UK's low household, business and government savings rate. The UK also invests the least of the comparison countries in gross fixed capital formation; in other words, a greater proportion of UK savings goes into household tangible assets (Exhibit 19).

The low levels of capital could be the result of low supply or low demand. Aggregate analysis indicates there may be a lack of supply of capital. However, the UK capital market is one of the most developed in the world, and we encountered no evidence to suggest that there is any kind of "market failure" in the capital market to cut off otherwise profitable investments by artificially raising the cost of capital. Additionally, we found no evidence at an aggregate level that there are higher "hurdle rates" in the UK than in other countries.

While low investment levels can explain some of the UK's labour productivity gap, we could find no compelling evidence to prove that it is the main causal factor for low labour productivity. If it were, then as the UK's capital intensity is significantly lower than the US', we would expect its capital productivity to be higher, thereby yielding a similar level of total factor productivity (TFP). However, the UK's capital productivity and TFP are both below those of the US (see Box 1: Total Factor Productivity), and if the UK, at current levels of TFP, were to exhibit US levels of capital intensity, then only around only one fifth of the labour productivity gap would be closed (Exhibit 21).

[4] Definition of domestic savings includes consumer durables, such as automobiles.

Labour markets

The UK has flexible labour markets – especially by European standards – and a commonly heard view is that low UK labour productivity is a function of a low skilled workforce.

It is very difficult to obtain any aggregate information on the "skill level," or "trainability" of the workforce. However, the information we were able to gather does lend some degree of support to the contention that the UK labour force might be less skilled than its French and German counterparts.

¶ **The UK has the most low-educated people of the comparison countries.** Less than 35 per cent of the French and German workforce have "very low" levels of qualification. However, more than 50 per cent of UK workers fall into that "very low" category, having not reached an appropriate standard for the end of compulsory schooling (Exhibit 22).

¶ **UK workers performed relatively poorly in an international literacy benchmarking study.** The OECD studied the literacy of the US, the UK and Germany. The study placed respondents into one of five skill levels on three axes, "prose," "document" and "quantitative." In all three cases, the UK had significantly more people in the lowest level than did Germany (Exhibit 23).

While it does appear the UK workforce may have fewer basic "skills" than the German or the French, this does not mean they are inherently unproductive. In fact, on almost any axis of skills, the UK looks remarkably like the US, which is the world leader in both output and productivity. At the industry level, we need to see how different countries organise their workforce to handle what appear to be different levels of skills.

Product markets

Although they are often overlooked in the debate over causes of low labour productivity, specific product market factors often have a significant effect on labour productivity. It is difficult to look at aggregate product market restrictions: apart from wide-sweeping trade barriers, which the UK, as one of the world's most open markets, does not have, they are by their nature industry specific. However, in previous country studies undertaken by the McKinsey Global Institute[5], product market regulations and restrictions have been found to

[5] See, for example, "Removing Barriers to Growth and Employment in France and Germany" (March, 1997), "Productivity – The Key to an Accelerated Development Path for Brazil" (March, 1998) and "Productivity-led Growth for Korea" (March 1998).

be a primary driver of low output and / or low labour productivity (Exhibit 24). For example:

- ¶ In the **automotive** industry in France and Germany, trade protection has led to a lack of exposure to global best practice, which has stifled productivity growth by domestic producers.
- ¶ In the **airline** industry in Brazil, restriction on competition for routes has lowered competitive intensity and again prevented the adoption of best practices.
- ¶ In the **retail** industry in Korea, strict zoning laws have slowed, and in many cases stopped, the evolution of more efficient retail formats.

Given that we have found little evidence at the aggregate level of either capital or labour market restrictions causing low labour productivity in the UK, we would expect product market factors to play a key role in explaining the output and productivity gap.

External macroeconomic factors

Much of the perceived wisdom about the UK's economic performance centre on external macroeconomic factors. For example, the historic impact of high and volatile inflation rates is said to make UK business people more cautious and less likely to innovate. It is true that since 1970 inflation in the UK has been consistently higher and more volatile than in the US, France, and West Germany, although volatility – measured as the standard deviation of changes in the consumer price index – has decreased sharply since 1983 (Exhibit 25). The high and volatile inflation rates could affect investment decisions, as decisions can be tempered by past experience.

CONCLUSIONS AND IMPLICATIONS FOR CASE STUDIES

Our aggregate analysis suggests that the key factor explaining the UK's relatively low current output level is low labour productivity, which could in part be a function of low capital intensity.

UK companies do invest less, and appear to have a somewhat less "skilled" workforce than other countries, both of which we explore and test further at the industry level. However, there does not appear to be a simple "magic-bullet" reason for low UK labour productivity. This indicates that our detailed industry case studies have the potential to bring significant insight to the drivers of UK labour productivity, and hence, output. The aggregate analysis is, and will always be, inconclusive because it does not capture the microeconomic factors, such as corporate governance structures and industry specific product market regulations, that can have a significant impact on how managers behave. The only way to determine the relative importance of all of the possible and relevant factors is to study specific industries and to look at how operations differ across countries and the reasons for the different choices managers have made.

Appendix: Sources and Methodology for Productivity Calculations

We use OECD data as a primary source for most of our aggregate analysis. However, incompleteness and a lack of uniformity in some cases require us to supplement this with data directly from national sources. We have worked closely with Mary O'Mahony at The National Institute of Social and Economic Research and Bart van Ark at the University of Groningen to ensure that our raw data and calculations for the aggregate analysis yield results that are as comparable as possible across countries. The sources and methodology for our work are described below.

¶ **Output**: We define output as value-added at factor cost (i.e., adjusted for indirect taxes plus subsidies). We also remove rent from our output figure. While we start with OECD output data, we supplement this as follows:

> **US:** Value added figures for certain sub sectors of the economy are obtained from the Bureau of Economic Analysis' National Income and Product Account to ensure that the output and hours worked data used corresponds to the same set of workers.
>
> **UK:** The UK does not report all its data to the OECD in a fashion comparable to the other countries studied. Thus much of our UK output data comes directly from the Office of National Statistics.
>
> **West Germany:** West German output data to 1993 is based on OECD figures which match German national accounts. Post 1993 we use data from the Statistische Bundesamt (Fachserie 18).
>
> **France:** French data is taken directly from the OECD to 1995. Post 1995 we use additional data from INSEE.

¶ **Labour inputs**: Labour inputs are total hours worked. Total hours worked are either measured directly, or obtained by multiplying the number of jobs by hours worked per job. The OECD does not publish an estimate of total hours worked in an economy. Furthermore, in their 'Employment Outlook' publication they state that the data they provide on annual average hours worked per person in employment is not suitable for comparisons between countries in any one year. Our employment and hours worked data is therefore taken directly from national accounts and other sources:

US: Hours worked data comes from the Bureau of Labour Statistics and the Bureau of Economic Analysis[6].

UK: Employment figures come from the Office of National Statistics and the Workforce in Employment survey. Hours worked per employee estimates come from a data set created by Mary O'Mahony.

West Germany: Employment figures are obtained from the Statistische Bundesamt (Fachserie 18). Hours worked estimates are obtained from a separate national source.

France: Employment and hours worked data come from INSEE.

¶ **Capital inputs:** Capital inputs are gross capital services, calculated using the Perpetual Inventory Method. All of the raw capital data is taken from a data series created by Mary O'Mahony.

¶ **Purchasing Power Parities:** PPPs are constructed for the group of comparison countries by aggregating OECD and Eurostat product-level PPPs (i.e., cheese), and making the PPP multilateral among the group of countries. Given that our PPPs are created to be transitive for our group of four countries rather then for all OECD countries, they differ from those used by the OECD. The market sector PPP is built up of OECD and Eurostat product-level PPPs that match our definition of the market sector. Manufacturing PPPs are based on work by Bart van Ark and are unit value ratios for 1987 updated to 1993.

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6 There is considerable controversy over estimates of annual hours worked per employee in the United States, with estimates ranging from 1650 to 1900. Wherever possible, we have started with total hours worked rather than attempting to calculate hours per worker.

Box 1

TOTAL FACTOR PRODUCTIVITY

The two factor inputs in an economy are labour and capital. Generally speaking, the addition of more capital into an economy results in a diminished absolute level of capital productivity because each additional increment of capital yields lower capital productivity than the previous one. At the same time, however, raising capital intensity levels also has the effect of raising labour productivity as each unit of labour input can then leverage the additional capital.

A high level of productivity in either (but not both) labour or capital is generally not in itself efficient because both inputs are scarce. In any economy it is important therefore to develop an optimal mix. Thus total factor productivity (TFP), which measures how effectively an economy uses these two inputs combined, is a key measure.

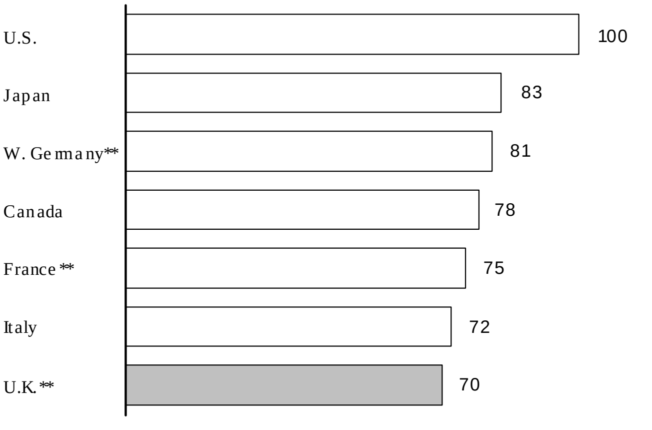
The UK's TFP trails all of the comparison countries. We have already seen that the UK has low labour productivity. In addition, the UK also has capital productivity that is below the US, and only slightly higher than France and West Germany. This is despite the UK having significantly lower capital intensity than any of the three comparison countries. As a result, the UK's TFP is around 20 per cent below US levels and around 10 per cent below France and West German levels (Exhibit 20).

Our focus on labour productivity, with little reference to capital productivity, in the main text of this report is justified by the fact that, at least relative to the US, the UK exhibits both lower labour productivity and lower capital productivity. Since the gap is greater in labour productivity, and labour makes up a greater share of total factor inputs than capital, then explaining the labour productivity gap should provide much of the explanation for the TFP and output gap.

Exhibit 1

GDP PER CAPITA* OF G7 COUNTRIES, 1994–96

Indexed to U.S. = 100



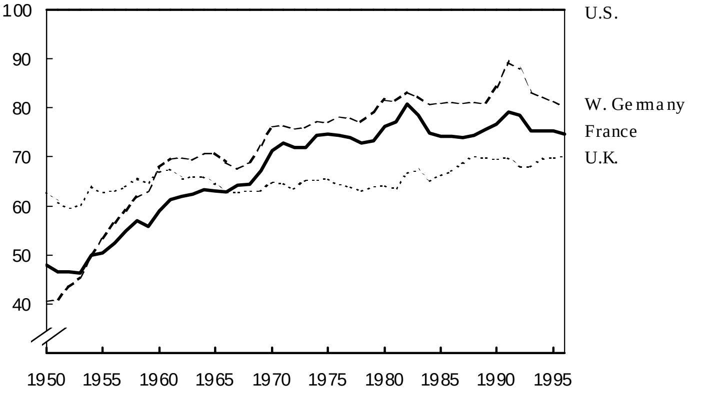
* Converted at GDP Purchasing Power Parities
** Numbers may differ from OECD because of modified output and PPP

Source: OECD; McKinsey analysis

Exhibit 2

HISTORIC GDP PER CAPITA*, 1950–96

Indexed to U.S. = 100



* Converted at OECD GDP Purchasing Power Parities

Source: OECD; McKinsey analysis

Exhibit 3

OUTPUT PER CAPITA* BY ECONOMIC SECTOR, 1994–96

Indexed to U.S. total economy = 100; ( ) indexed to U.S. sector = 100

Total Economy		U.K.	France	W. Germany	U.S.
Market sectors	Manufacturing	13 (62)	15 (71)	23 (106)	21 (100)
	Services**	33 (60)	30 (54)	36 (65)	55 (100)
	Total market sector	**46 (61)**	**45 (59)**	**58 (77)**	**76 (100)**
Non-market sectors***		23 (99)	30 (128)	23 (97)	24 (100)
Total economy		**70**	**75**	**81**	**100**

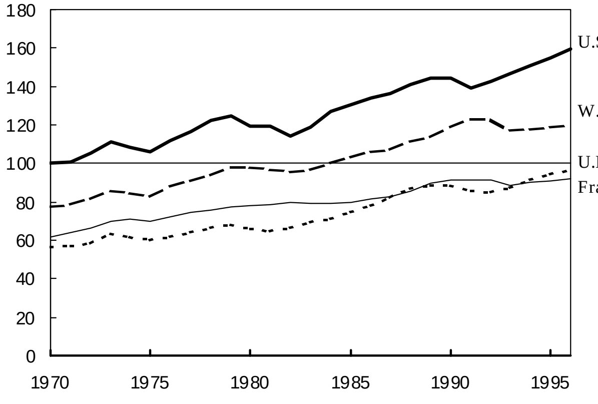
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities
** Services include market services (transportation, communication, wholesale and retail trade, finance, insurance, real estate and services), agriculture, construction, utilities, and mining
*** Non-market sectors include government services, health, and education

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 4

MARKET SECTOR OUTPUT* PER CAPITA, 1970–96

Indexed to U.S. in 1970 = 100



	Last 3 cycles**	70s cycle**	80s cycle**	90s cycle**
		CAGR (%)		
U.S.	1.6	1.9	1.5	1.4
W. Germany	1.5	2.3	2.0	-0.6
U.K.	1.9	1.2	2.4	1.5
France	1.2	1.4	1.8	0.2

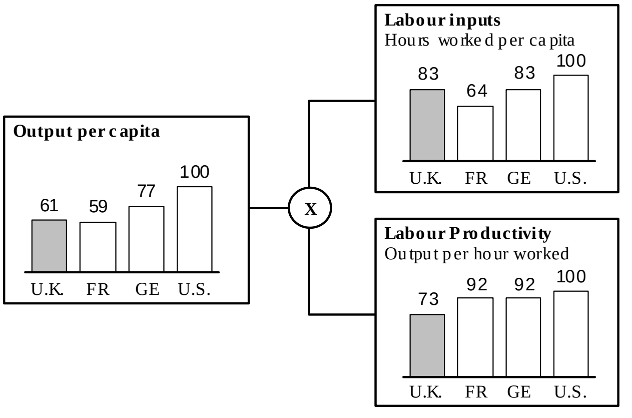
* Converted at constructed 1993 market sector PPP
** Growth rates refer to business cycles (measured as peak to peak); for the U.S., 70s cycle is 1973-79, 80s cycle is 79-89, 90s cycle is 89=96; for West Germany 70s cycle is 1973-79, 80s cycle is 79-91, 90s cycle is 91-96; for the U.K., 70s cycle is 1973-79, 80s cycle is 79-90, 90s cycle is 90-96; for France, 70s cycle is 74-82, 80s cycle is 82-90, 90s cycle is 90-96

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 5

MARKET SECTOR OUTPUT* PER CAPITA, 1994–96

Indexed to U.S. = 100



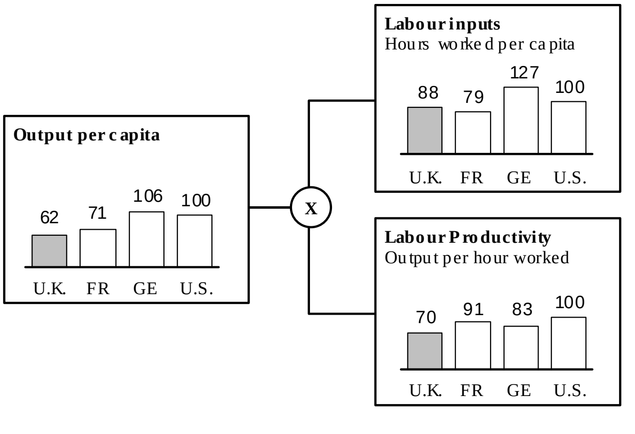
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities; market sector does not include government services, health and education

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 6

MANUFACTURING SECTOR OUTPUT* PER CAPITA, 1994–96

Indexed to U.S. = 100



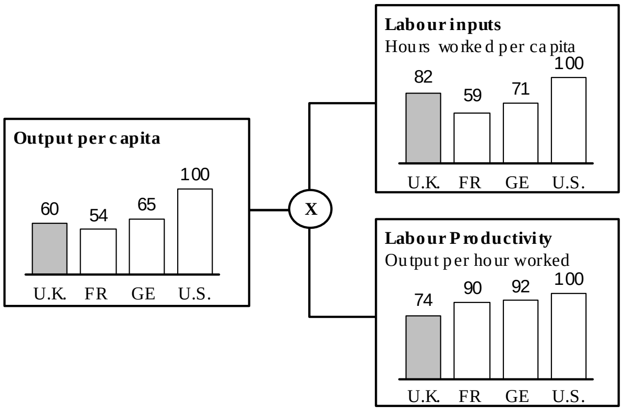
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 7

MARKET SERVICE SECTOR OUTPUT* PER CAPITA, 1994–96

Indexed to U.S. = 100



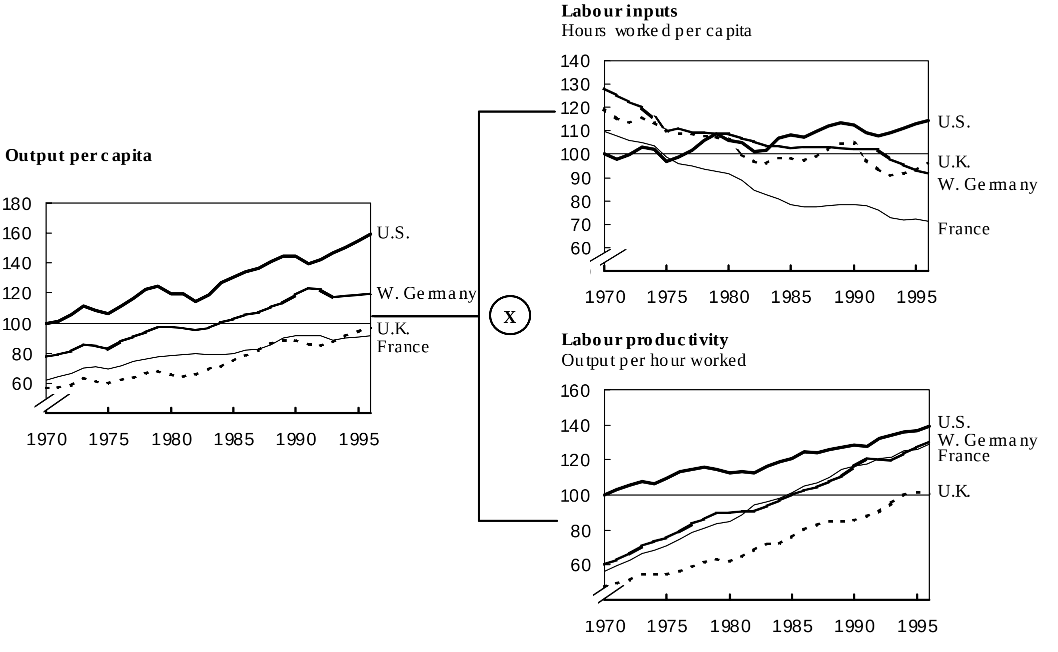
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities; Market services includes transportation, communication, wholesale and retail trade, finance, insurance, real estate and services, agriculture, construction, utilities, and mining

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 8

MARKET SECTOR OUTPUT* PER CAPITA, 1970–96

All figures indexed to U.S. in 1970 = 100



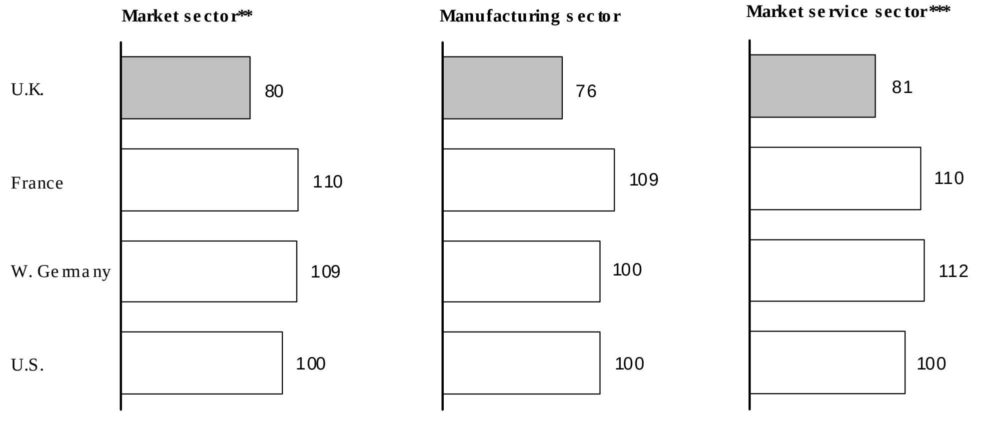
* GDP excluding indirect taxes, subsidies and rents; converted at 1993 Purchasing Power Parities; market sector does not include government services, health and education

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 9

CAPITAL INTENSITY BY SECTOR, 1994–96

Capital services* per hour worked; Indexed to U.S. = 100

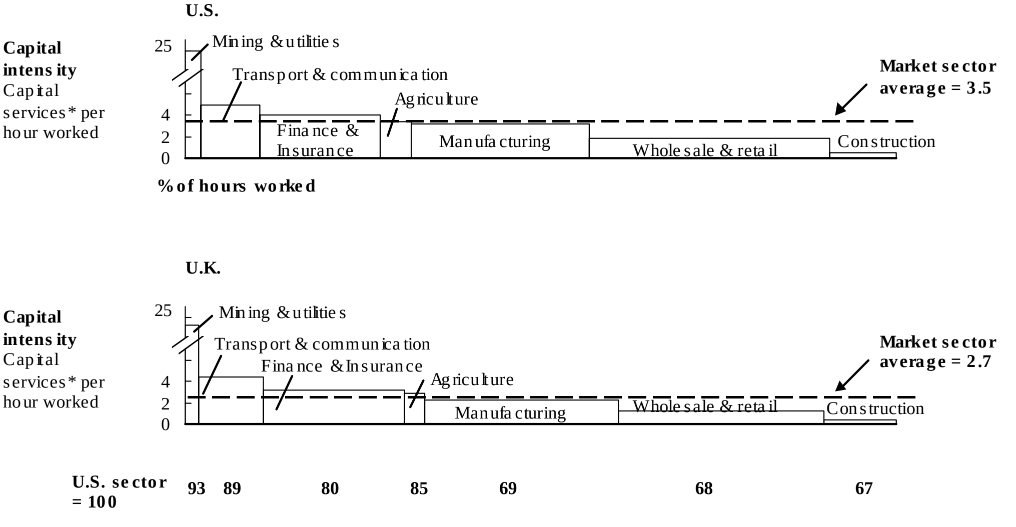


* Using O'Mahony PPPs on sector-specific capital estimates
** Does not include government services, health care, and education
*** Services include market services (transportation, communication, wholesale and retail trade, finance, insurance, real estate and services), agriculture, construction, utilities, and mining

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; O'Mahony; National sources; McKinsey

Exhibit 10

SECTOR-SPECIFIC CAPITAL INTENSITY & LABOUR HOURS, 1995



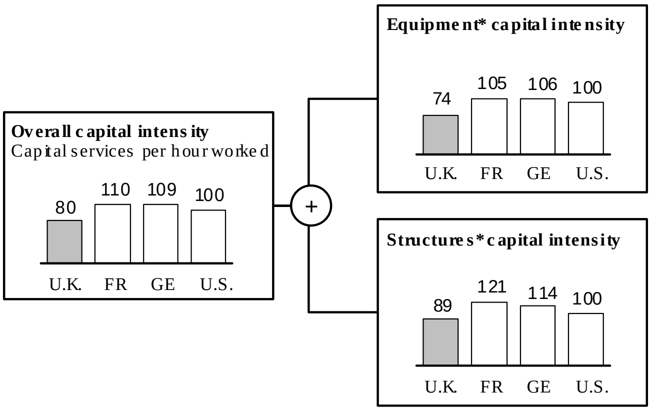
* Converted at O'Mahony constructed PPPs

Source: O'Mahony; Labour Market Trends; OECD Labour Force Statistics; OECD Employment Outlook; BLS; BEA; McKinsey analysis

Exhibit 11

MARKET SECTOR CAPITAL INTENSITY SPLIT, 1994–96

Indexed to U.S. = 100



* Equipment makes up roughly 2/3 of capital services in all 4 countries

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; O'Mahony; National sources; McKinsey

Exhibit 12

LABOUR INPUTS PER CAPITA* BY ECONOMIC SECTOR, 1994–96

Indexed to U.S. total economy = 100; ( ) indexed to U.S. sector = 100

	U.K.	France	Germany	U.S.
Total Economy – Market sectors – Manufacturing	14 (88)	13 (79)	21 (127)	16 (100)
Total Economy – Market sectors – Services**	49 (82)	36 (59)	42 (71)	60 (100)
Total market sector	**63 (83)**	**48 (64)**	**63 (83)**	**76 (100)**
Total Economy – Non-market sectors***	18 (77)	19 (81)	15 (63)	24 (100)
Total economy	**81**	**68**	**78**	**100**

* Total hours worked per capita

** Services include market services (transportation, communication, wholesale and retail trade, finance, insurance, real estate and services), agriculture, construction, utilities, and mining

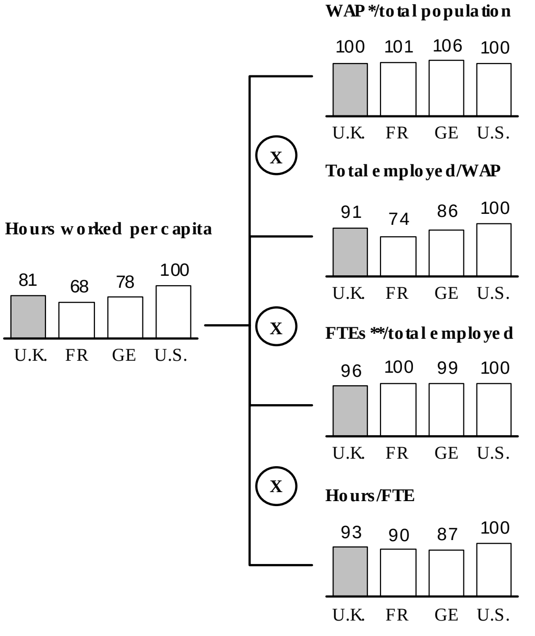
*** Non-market sectors include government services, health and education

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; McKinsey

Exhibit 13

DRIVERS OF EMPLOYMENT, 1994–96

Indexed to U.S. total economy = 100



* Working Age Population; between 15 and 64 years old

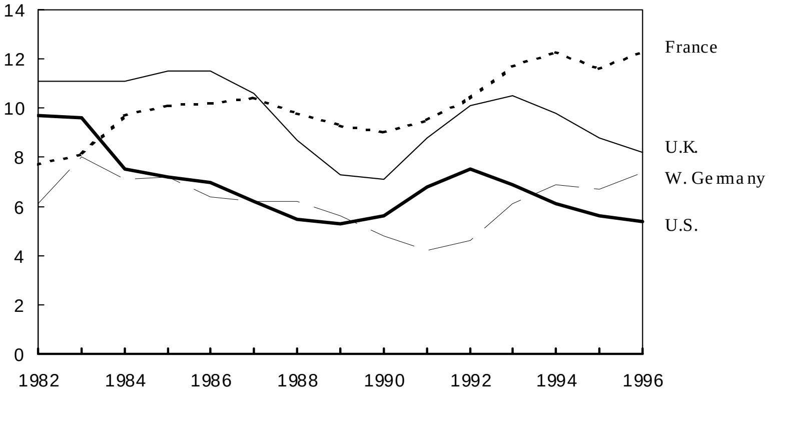
** Full-time Equivalent Employees; adjusted for part-time workers, where 1 part-time worker equal 0.5 FTE

Source: OECD Employment Outlook; OECD National Accounts; National sources; McKinsey

Exhibit 14

STANDARDISED UNEMPLOYMENT RATES BY COUNTRY

% of active workforce (market and non-market sectors)

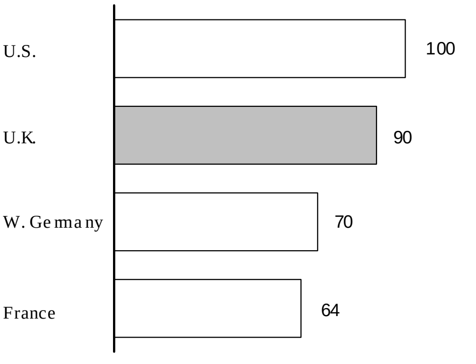


Source: OECD Labour Force Statistics; OECD Employment Outlook; Labour Market Trends; McKinsey analysis

Exhibit 15

PARTICIPATION RATE FOR AGES 55–64, 1996

Indexed to U.S.=100

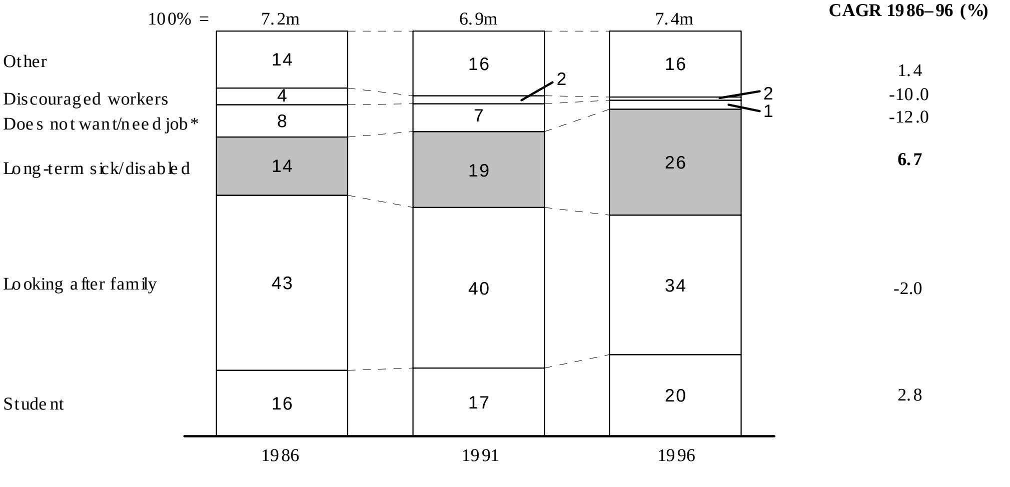


Source: OECD Employment Outlook; OECD National Accounts; McKinsey

Exhibit 16

REASONS FOR INACTIVITY IN U.K. WORKING AGE POPULATION

% of total



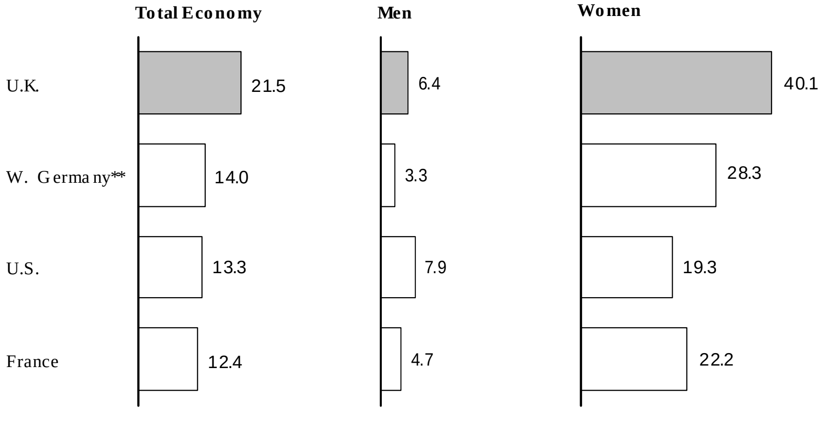
* May not provide consistent time series

Source: Labour Market Trends; McKinsey analysis

Exhibit 17

PART-TIME EMPLOYMENT* AS A PROPORTION OF EMPLOYMENT, 1994–96

%



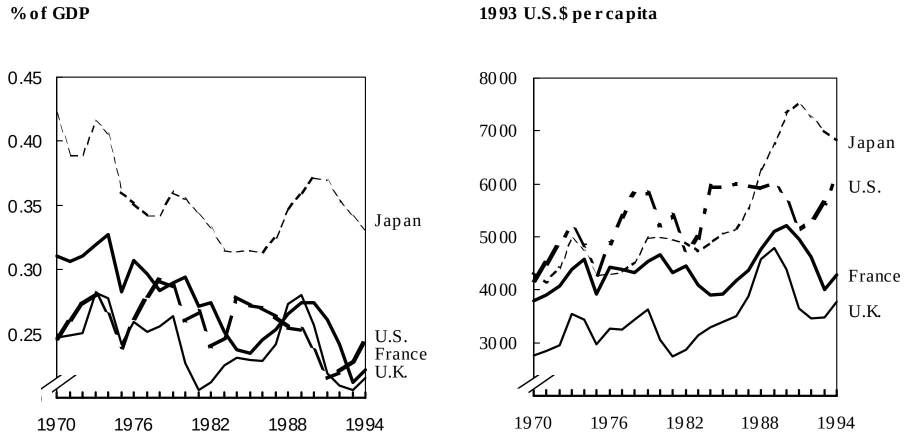
* Defined as usually working fewer than 30 hours per week; includes both market and non-market sectors

** Data series ends in 1995; 1996 assumed to be the same

Source: OECD Employment Outlook; McKinsey analysis

Exhibit 18

GROSS DOMESTIC SAVINGS*



* Converted at 1993 GDP OECD PPPs; includes consumer durables

Source: OECD National Accounts; McKinsey analysis

Exhibit 19

SOURCES AND USES OF GROSS SAVINGS, 1986–94

% of GDP

Sources*

Source	U.S.	Jap	Fra	Ger**	U.K.
Households	11.8	15.2	7.3	19.4	9.6
Businesses	12.7	15.0	17.2	10.6	11.2
Net international inflows***	1.7	-2.8	0.0	-2.7	3.1
Government	-2.4	7.3	0.3	1.5	-0.5
Total	23.8	34.7	24.9	28.8	23.5

Gross domestic saving

Uses*

Use	U.S.	Jap	Fra	Ger**	U.K.
Household tangible assets	9.1	11.7	11.2	11.3	10.9
Government GFCF****	1.7	5.4	3.3	2.2	1.9
Business GFCF****	12.9	16.9	10.1	15.1	10.5
Business & government	14.6	22.3	13.4	17.3	12.4
Total	23.7	34.0	24.6	28.6	23.3

* Sums may not equal because of rounding, statistical discrepancies in OECD accounts

** West Germany, data only from 1987–93

*** Includes FDI, portfolio investments, and loans

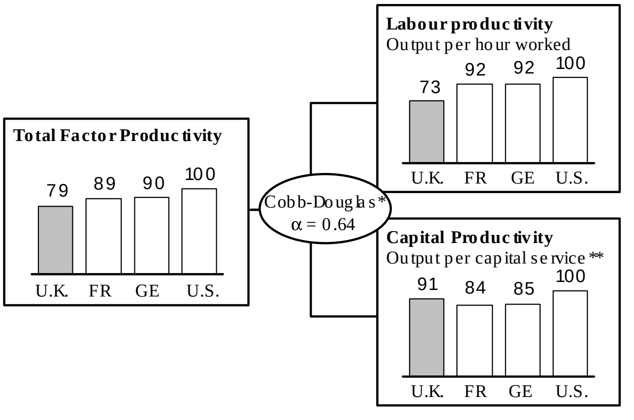
**** Gross Fixed Capital Formation

Source: OECD National Accounts; McKinsey analysis

Exhibit 20

TOTAL FACTOR PRODUCTIVITY, MARKET SECTOR, 1994–96

Indexed to U.S. = 100



* Cobb-Douglas production function, share of labour average of 4 countries

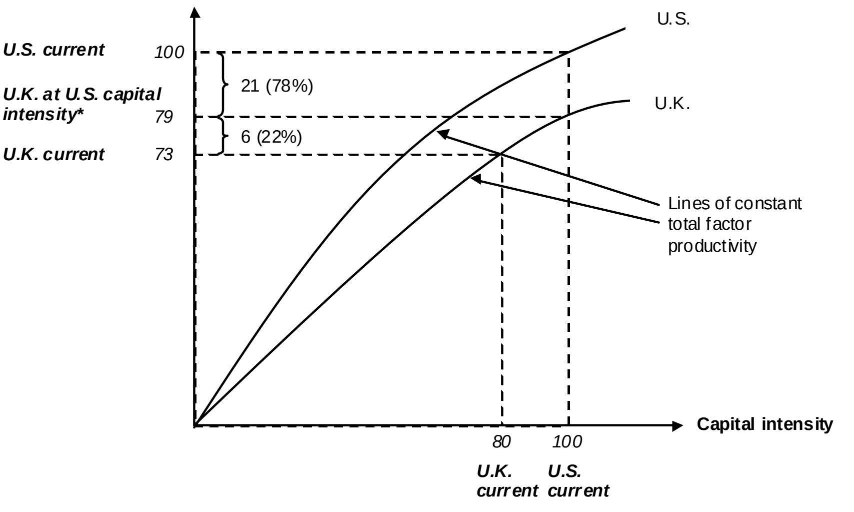
** Using O'Mahony PPPs on sector-specific capital estimates

Source: OECD National Accounts; OECD PPPs; Fisher PPPs; van Ark PPPs; National sources; O'Mahony; McKinsey

Exhibit 21

IMPACT OF INCREASING U.K. CAPITAL INTENSITY

Indexed to U.S. = 100



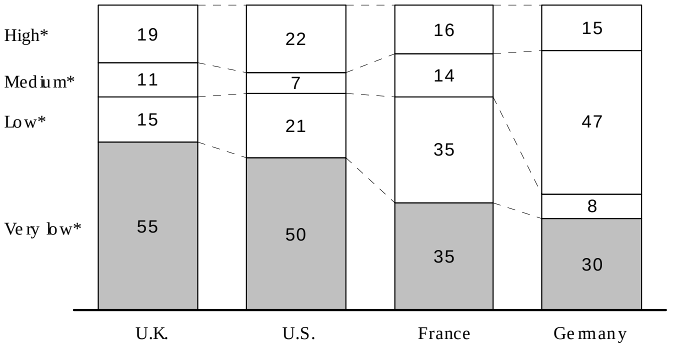
* Assumes same total factor productivity as current U.K.

Source: OECD National accounts; OECD PPPs; Fisher PPPs; Van Ark PPPs; National sources; McKinsey analysis

Exhibit 22

DISTRIBUTION OF POPULATION BY QUALIFICATION LEVEL

%



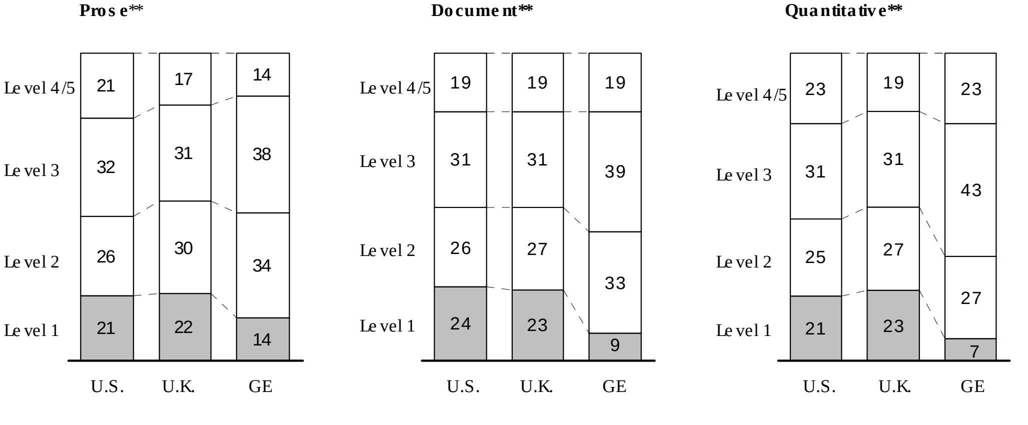
* Very low = not reaching standard appropriate to the end of compulsory schooling; Low = standard appropriate to the end of compulsory schooling; Medium = equivalent to at least 3 A Levels or NVG; High = at least degree or professional qualification

Source: U.K. Skills Audit; McKinsey analysis

Exhibit 23

BREAKDOWN OF BASIC LITERACY SCORES BY SKILL LEVEL*, 1994–95

% of respondents in skill level



* Tasks grouped into 5 'levels' according to empirically determined progression of information-processing skills & strategies; level 4/5 is highest ranking

** Prose refers to understanding and using information contained in texts; document refers to processing and using information presented in forms such as charts, graphs, and maps; quantitative refers to being able to deal with numbers and basic mathematical operations

Source: International Adult Literacy Survey, 1994-95; McKinsey analysis

Exhibit 24

SUMMARY OF PREVIOUS MGI FINDINGS

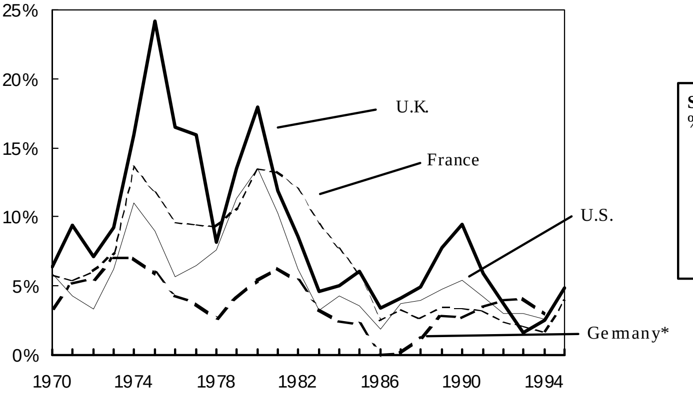
● Important
○ Secondary
- Undifferentiating

Country	Output per capita	Macro-economic	Labour Market	Capital Market	Product Market	Example of product market regulations
		External factors explaining lower output				
Sweden (1995)	70	-	○	○	●	• Farmers' cooperatives and other large food manufacturers were granted domestic monopolies (food processing)
France / West Germany (1997)	60 (Fr) 70 (Ge)	-	○	-	●	• Trade protection led to lack of exposure to global best practice (automotive) • Regulations led to uneconomic pricing (telecom, retail banking)
Brazil (1998)	20	●	-	○	●	• Restriction on competition for airline routes (airlines) • Import tariffs on IT (airlines, retail banking) • Lack of zoning law enforcement in residential housing (housing construction)
Korea (1998)	50	-	○	○	●	• Strict zoning laws prevented the evolution of more efficient retail formats (retail) • Tariff and non-tariff barriers have protected industries from exposure to best practice (steel)

Exhibit 25

VOLATILITY OF INFLATION GROWTH, 1970–95

Increase in Consumer Price Index, %



Standard deviations
%

	U.S.	U.K.	Fra	Ger
1970-83	3.2	5.5	2.8	1.4
1983-95	1.0	2.1	2.4	1.3
1970-95	3.1	5.6	4.0	1.9

Source: International Monetary Fund; McKinsey analysis

Automotive

EXECUTIVE SUMMARY

Automotive is one of the largest manufacturing sectors, both in the UK and globally. The sector consists of two principal sub-sectors: vehicle assembly and component manufacturing. In the UK, physical vehicle output has grown at over 5 per cent per year for the last 10 years, driven by the arrival of three new Japanese transplant factories built by Nissan, Honda and Toyota. The component industry has experienced similar growth. While there are no longer any UK owned mass vehicle manufacturers, several large automotive suppliers are headquartered in the UK.

On average, the UK automotive sector's labour productivity is half that of Japan and 70 per cent that of the US. Capital productivity is 70 per cent of both Japan's and the US'. Some UK plants, however, are truly world-class in productivity, quality and delivery performance. Others lag significantly behind plants in other countries.

In automotive assembly, the gap in labour productivity is driven by the performance of the older, established factories in the UK. The new Japanese transplants show levels of productivity that match Japanese factories in Japan. The lower level of productivity in established plants is caused by a failure to implement fully best practice 'lean manufacturing' techniques. The skills and motivation levels of employees at all levels have contributed to this problem. Progress has been made, but not always enough, and the challenge for management in some companies will be to recognise this failure and act on it, whether it be in-plant or during the process of developing the vehicles and the design of the lines that will build them.

In component manufacture, suppliers to Japanese transplant factories have delivered large improvements in quality and productivity, driven by the demands of their customers. However suppliers to other assemblers, and the large number of suppliers lower down in the supply chain, have not improved their manufacturing processes and raised productivity to such a great extent. Management, in particular, must shoulder responsibility for this failure. In some cases, especially in the smaller companies, management simply does not realise the gap in knowledge that exists between what they think is lean production and the reality. In other cases however, management seems content with a level of improvement that is below both the possible and the necessary. Initiatives such as the Society of Motor Manufacturers and Traders (SMMT) Industry Forum, working with second and third tier suppliers, are improving the situation, not just through the application of lean methods, but also because they illuminate the gaps in knowledge and expectations. Once the gap is exposed, management can seek to fill it.

Whilst transforming a brownfield site is always more difficult than creating a productive greenfield site, this failure to raise productivity to best practice levels is partly due to the fact that the UK's domestic industry has been protected from full competition with Japan by a number of trade barriers. The Voluntary Restraint Agreement (VRA) that affords this protection is due to end in 1999 and its removal will undoubtedly provide a further stimulus for improvement. The introduction of the Euro will also provide two pressures to improve productivity. Firstly, price transparency across markets will inevitably erode margins, putting manufacturers and their plants under pressure to reduce costs. Secondly, the Euro zone will create transparency in the manufacturing cost base and with the fog of exchange rate fluctuations lifted, plants will need to improve their ranking to survive. This will inevitably raise the pressure on non-Euro zone plants, including those in the UK, both assembly and component plants.

Another factor that has reduced the pressure on productivity improvements has been the support that 'national champions' in the industry have traditionally received from Government, for example the subsidies paid to Rover during its period of public ownership. This has contributed to the growing overcapacity in the industry, now estimated at about 5 million units in Europe. As with the issue of competition, this situation is changing at an EU level.

Government, industry and trade unions all have their part to play in improving the UK's productivity in the automotive sector. Government should focus on ensuring free competition to provide the necessary pressure to improve, ideally in a stable macro-economic environment. In addition, maintaining flexible labour market rules is vital to sustaining the further development of the UK's manufacturing base. Government support for industry-led training in schools and universities, and assistance in promoting the sharing of best practice through industry led projects such as the Society of Motor Manufacturers and Traders Industry Forum, will also enhance the UK's relative attractiveness as a manufacturing base. For industry, efforts to improve productivity in product and process development, plant shop floors, indeed, in all functions should be stepped up with a relentless and genuinely stretching pursuit of improvement becoming the norm.

But improving manufacturing processes alone will not be enough. Innovation is also necessary for productivity improvement. Cost reductions generated from increased efficiency provide the profitability to fuel innovation, and innovation creates the growth opportunities to maintain or even expand employment opportunities.

For a genuine lift in the competitiveness of the automotive manufacturing sector Government, the unions, the workforce and above all the industry itself must act. If these stakeholders act together we believe that the UK has relatively good prospects for improving productivity in its automotive base.

Automotive

INTRODUCTION

This case study compares and contrasts the labour productivity of the UK automotive sector with that of Japan, the US and West Germany. It aims to explain as fully as possible the root causes of labour productivity differences. The sector covers the manufacture of vehicles, primarily cars and trucks, and the manufacture of component parts for vehicles.

In all comparisons we use Japan as the benchmark country as in all previous international studies Japan has exhibited the highest productivity. For the UK, US and Japan we compare labour productivity for both vehicle manufacture and component manufacture, separately. For West Germany, data availability means that we can only compare at the total sector level. For all countries we use National Census data which covers a period up until 1995, the latest data available at the time of publication.

In this case study labour productivity is defined as gross value added per hour worked. Gross value added may be approximately defined as 'sales value - raw materials cost'. To ensure consistency across countries we calculate an 'Auto Specific Purchasing Power Parity' exchange rate. Put simply, this adjusts the value added so that it reflects the value of the different countries' output had it been all sold in the same country, in this case the US. Our methodology is described in detail in the Appendix.

As well as labour productivity, we also look briefly at capital productivity, defined as gross value added divided by the average annual capital services cost.

The automotive industry is one of the largest manufacturing sectors in both the world and the UK. It is a fiercely competitive global industry, and returns to all players have been low in recent decades. New entrants, cyclical demand and high exit barriers have combined to make productivity improvements an imperative for all manufacturers: automotive innovations often lead the way for other sectors. A good example of this is Toyota's pioneering development of 'lean production', a manufacturing technique that continuously strives to reduce all types of waste from the process, born out of the harsh economic conditions in Japan in the 1950s.

The UK industry has experienced mixed fortunes. During the 1970s most of the British owned vehicle manufacturers either closed or combined to form what is today the Rover Group. When BMW bought Rover in 1994, the UK was left with only a small number of niche manufacturers under British ownership, and even some of these companies have since been bought by foreign car makers.

Notwithstanding this shift in ownership, the number of vehicles manufactured in the UK has grown by over 50 per cent in the last ten years to 1.9 million in 1996, 90 per cent of which are cars. The components industry has enjoyed similar growth. This growth has been due largely to the construction of three greenfield plants in the UK by the Japanese companies, Nissan, Toyota and Honda. These new plants are export focused and have contributed to a four-fold increase in exports of cars from the UK to over 900,000 cars a year in 1996 (Exhibit 1). This growth look set to continue through 1998 with the Japanese transplants and some established plants expanding production capacity.

The UK vehicle mass production plants are now all viewed as part of a European or global network of manufacturing facilities by their foreign owners. As a result, unlike France, West Germany, the US and Japan, with their large national companies, the UK has no inherent 'right' to build cars. Much has already been done that has made the UK an attractive location for car manufacturers, in particular the labour market reforms of the 1980s. However, if the UK is to retain and build on its current position it is vital that all UK vehicle and component manufacturers can demonstrate globally competitive productivity.

In 1995, the UK automotive industry directly employed approximately 230,000 people full time and created value of £9.1 billion, 6 per cent of the total manufacturing sector. Vehicle manufacturing provided 61 per cent of this employment and produced 69 per cent of the value. The major vehicle producers, who are shown in Exhibit 2, were responsible for over 70 per cent of this. Component manufacturing is much more fragmented, with large companies responsible for only 15 per cent of output and employment in 1995. The key facts about the vehicle manufacturing industries in the UK and comparison countries are shown in Exhibit 3.

In 1996, the three comparison countries, the US, Japan and West Germany all produced more vehicles than the UK at 11.7 million, 9.8 million and 4.7 million respectively, together accounting for 50 per cent of global production. US production is largely split between General Motors, Ford and Chrysler (the 'Big 3', albeit that with the formation of DaimlerChrysler the US owned companies are now the 'Big 2') with 81 per cent and Japanese transplants with 18 per cent. Most of the cars produced in the US are for domestic consumption. Japan has an intensely competitive domestic market, 93 per cent of which is held by nine national producers. Historically Japan has relied heavily on exports, although in the last 10 years export production has declined by over 3 million to under 4 million vehicles, as Japanese producers have pursued a strategy of shifting production closer to market to avoid trade barriers and the pressure of the strong yen. West Germany has three strong national 'mass production' companies, Volkswagen, BMW and Mercedes-Benz, who account for 63 per cent of output and hold 40 per cent market share. Ford and General Motors make up most of the remaining production and 60 per cent of total production is exported.

Both the US and Japanese vehicle components industries are much larger than the UK's. Both generate almost as much value as the vehicle manufacturing sector, whereas in the UK the ratio is approximately half.

PRODUCTIVITY PERFORMANCE

Total automotive sector

The labour productivity of the total UK automotive sector is 49 per cent of the benchmark country Japan's, 71 per cent of the US' and 79 per cent of West Germany's. This difference in productivity with Japan means that although the total labour hours input per capita is half the Japanese level, the output per capita is only a quarter (Exhibit 4). Labour productivity in the total UK automotive sector increased sharply coming out of the 1991 recession but grew only slowly between 1993 and 1995.

The UK's capital productivity performance is 70 per cent of Japan's and the US' and equal to West Germany's. Capital intensity is a measure of the amount of capital used in the industry, defined as the annual capital services cost per hour worked. The UK and US automotive sectors have the same capital intensity. Japan and West Germany have higher levels of capital intensity, with the UK's at 68 per cent and 76 per cent of their levels, respectively.

These labour and capital productivity results can be combined to give a 'total factor productivity' (TFP) using the Cobb Douglas formula defined in the Appendix. We find that the TFP for the UK is 56 per cent of Japan's, 72 per cent of the US' and 88 per cent of West Germany's.

Vehicle manufacturing sub-sector

This sub-sector includes the manufacture of cars, trucks and other vehicles and also trailers and caravans. Here the UK's labour productivity is 40 per cent of the Japanese and 56 per cent of the US level (Exhibit 5). As 70 per cent of UK employment in vehicle manufacturing is created by the large mass vehicle producers, it is largely their performance that is responsible for the productivity gap. To understand this gap better we dis-aggregated the labour productivity by manufacturing plant, using a physical measure of labour productivity, 'vehicles per equivalent employee per year'. We then adjusted this measure to reflect the different values of cars being produced in each vehicle manufacturing plant (Exhibit 6).

This analysis shows a distinct difference between the performance of the new greenfield plants in the UK and the older, established operations. Overall the average labour productivity is about half the average greenfield value. International plant level benchmarking reports and internal company data confirm that the Japanese plants in the UK deliver productivity comparable with other company plants of a similar size, stage of development and model mix in Japan or North America. Two of the Japanese plants are relatively new however, have not yet reached maximum planned capacity and are expected to increase productivity in future years. This aside, most of the productivity gap is due to the performance of the established operators, and to a lesser extent the tail of small and medium sized businesses, which account for only about 20 per cent of employment.

Interestingly, 1997 data reveals that one of the established plants, Ford’s Dagenham operation, is getting close to the performance of the two smaller Japanese plants. Indeed, on the basis of vehicles per employee (not adjusted for vehicle value) Dagenham was more productive than Toyota in 1997. However, whereas both the Japanese plants have recruited additional staff who are now in training for planned volume increases, Dagenham is now operating close to maximum capacity. Dagenham will need to achieve further productivity increases unrelated to volume growth, to maintain its position in 1998. Moreover, the Nissan plant at Sunderland has increased its lead over all other UK plants by a substantial margin, showing what is achievable in a mature Japanese factory.

Vehicle component sub-sector

In this sub-sector the UK’s productivity performance is 45 per cent of Japan’s and 73 per cent of the US’ (Exhibit 7). The components industry is far more fragmented than vehicle manufacturing, so analysing the performance of the larger players does not yield any insights. Labour productivity across businesses of different sizes, measured by number of employees, is relatively constant (Exhibit 8). However, it is lower in businesses employing fewer than one hundred people and in businesses employing more than one thousand. Below average labour productivity would therefore appear to be an issue for all types of business in the UK components industry, and the gap is not created by a small number of large operations or a long tail of small businesses.

In the components sub-sector labour productivity grew at a rate of 9 per cent per annum between 1993 and 1995, albeit from a low base. In the US and Japan labour productivity was static during this period.

REASONS FOR DIFFERENCES IN PRODUCTIVITY PERFORMANCE

Exhibit 9 summarises the causes of labour productivity differences. We divide them into three categories:

¶ **Production Processes:** Factors that relate to the way work is carried out or management decisions are made at the operating level, in both production and innovation

¶ **Industry Dynamics:** Factors that relate to the degree and type of competition within the industry

¶ **External Factors:** Factors in the external environment that affect industry dynamics or production processes.

Clearly there is a causal relationship between these factors; however, separating them allows us to describe them more clearly. As the vehicle manufacturing and components industries are so inter-related we do not consider them separately. However, where there are distinctions between the two we indicate this in the text.

Production processes

Factors of primary importance

The most important factors in creating the productivity gap between the UK and Japan are operations, including organisation of functions and tasks, design for manufacture and supplier relations. Frontline skills and motivation are also significant factors. Comparing the US with the UK, shows that matching of capacity to demand is important too. For the component sub-sector only, a lack of innovation is of primary importance, in comparison with Japan and West Germany.

¶ **Operations.** International benchmarking studies conducted by the IMVP and others have proved that 'lean production' is the most productive way to build cars or manufacture components. Different companies have developed their own lean production models but the elements are essentially the same: smooth, integrated production flow which is pulled by customer demand; defect prevention rather than rectification via root cause problem solving; flexible, team based working; elimination of waste (including non value added activities); and close integration of the whole value stream from raw material to finished customer. A company wishing to implement lean production successfully must address three main areas: the organisation of functions and tasks in the plant, including the construction of a synchronised production system; the way in which it designs new products; and relationships with suppliers and customers. Maximum benefit is only achieved when all three areas are optimised. In the UK we have found variable performance among companies in each of the three areas.

- *Organisation of functions and tasks.* Underpinning the lean production philosophy first developed by Toyota is the 'smoothing' or 'levelling' of the production schedule in line with customer demand. This levelled schedule provides the plant, and its suppliers, with stability in planning and broadly characterises the Japanese approach both in the UK and other countries. Vehicles are scheduled through body construction, paint and assembly with material and components 'pulled' from suppliers and plant areas to the main assembly line. Replenishment is triggered on the line as material is used.

  Inventory levels are kept low throughout the lean production system. Exhibit 10 shows that the UK has significantly higher levels of work in progress in vehicle manufacture than do the US and Japan. However, levels of performance differ between UK manufacturers with the Japanese transplants in the UK also having low inventory. Exhibit 11 shows a very similar pattern for automotive parts.

  Workforce organisation in lean production is different to that of traditional manufacture. Workers are organised into flexible teams. They are generally multi-skilled and capable of carrying out a variety of manufacturing tasks as well as taking responsibility for quality and basic cleaning and checking of equipment. This means that the number of workers classed as support or 'indirect' tends to be lower. The number of vehicles produced for every indirect worker is significantly higher in Japan and Japanese owned UK plants (Exhibit 12).

  The use of teams among 'first tier' suppliers is higher in Japan than in the UK (Exhibit 13). Most of the UK mass vehicle manufacturers now have team based organisational structures. However, it is not the team itself but the way it operates that generates high productivity. In best practice operations:

  – Well trained and remunerated team leaders keep detailed records of all the standard processes carried out by the team, monitor compliance and balance the workflow, lead improvement efforts and co-ordinate the activities of support functions as well as shop floor workers to ensure constant improvement in productivity.

- Visual statistical measures are actively used to aid continuous improvement problem solving within the team
- Team members are multi-skilled and can undertake a variety of tasks, including cleaning, checking of equipment and workplace organisation
- There are continuous improvement initiatives, led by top management at a plant level and supervisors at a line level, but involving shop floor team members and indirect support functions.

Some UK manufacturers have replicated the mechanics of best practice organisation of functions and tasks, such as working in teams, without successfully implementing the key elements that deliver the benefit. The relentlessness of improvement efforts is also not as sustained in established sites as in the Japanese transplants. The words and plans presented in the office often sound similar, but the difference becomes more tangible on the shop floor. Nissan, for example, has re-invented its approach to improvement to ensure continual, high productivity gains and seems never to tire of this pursuit. Other companies go through periods of high improvement then slip back to a lower pace.

In the UK components industry the introduction of best practice organisation of functions and tasks has largely been restricted to first tier component suppliers dealing with Japanese transplants. As explained below, the transplants have been the key driver of this. The impact is, however, restricted to individual plants within companies and sometimes individual dedicated lines.

Overall, therefore, the implementation of best practice organisation of functions and tasks in the UK automotive sector is well developed in the Japanese transplants, partially developed in the established vehicle manufacturing base and in some plants of some first tier component suppliers, and only just starting to penetrate the very large number of lower tier suppliers. In the US best practice is further developed among vehicle manufacturers and first tier suppliers, but still lacking in the lower tiers. In Japan best practice is well developed amongst all vehicle manufacturers and has penetrated much deeper into the supplier base.

- *Design for Manufacture and Assembly (DFMA).* This technique involves engineers and designers working closely together so that new products are designed for ease of manufacture, from the basic components upwards. As many companies design ‘platforms’, they drive this activity centrally rather than locally within countries of manufacture. A ‘platform’ is a family of products which share common components, manufacturing and assembly facilities as well as the teams who design and manufacture them – including suppliers. Platforms allow manufacturers to ‘engineer to perfection’ components (using the broadest definition here, including what are often called modules, systems and assemblies) which are produced in large volumes and used, often invisibly from a customer’s point of view, in different products. DFMA performance among Japanese companies is generally superior but still variable, with the UK containing both the best and the worst exponents. Ford has made significant progress in the area of DFMA and GM/Vauxhall by its own admission is only just beginning. Rover is in the process of moving away from the Honda platforms, designed during their period of alliance, to a range of new models. In the process it is working hard to develop rapidly DFMA expertise, which it has in the past not fully exploited. The best exponents of DFMA work closely with suppliers.

- *Supplier Relationships.* Close, integrated supplier relationships are a critical element of high productivity in automotive assembly. First tier suppliers are increasingly required to undertake sub-assembly for manufacturers. In addition, they are expected to deliver parts on a just in time basis, often direct to the assembly line in the required sequence. Companies with well integrated supplier relationships tend to deal with fewer suppliers for much longer periods of time. On average, manufacturers in Japan deal with fewer suppliers than those in Europe and the US (Exhibit 14). Japanese transplants in the UK have also managed to develop close supplier relationships, enabling them to help suppliers dramatically improve component quality and implement just in time delivery (Exhibit 15). As a condition of its development grant, Nissan was compelled to use local suppliers and Honda and Toyota have adopted similar policies, following Nissan’s success. The established UK vehicle manufacturers have historically been less pro-active in this area. Indeed the fact that they have not implemented best practice techniques themselves and smoothed production schedules has had serious knock-on effects in the supply chain. In recent years the established manufacturers have made substantial efforts to reduce the number of suppliers with whom they deal and to develop strategic supplier relationships. They have also formed supplier assistance teams aimed at helping suppliers to implement lean production methods.

  The average component quality among UK first tier suppliers is below that in the US and Japan (Exhibit 16). Although the impact of the Japanese transplants has been dramatic where it has occurred, it has also been limited. In particular, first tier component suppliers have not developed the close relationships with their own suppliers that would enable them to raise quality and improve delivery performance. In the US, although first tier suppliers match Japanese performance, problems still occur in the lower tiers. The US first tier suppliers act as a quality filter in the supply chain. It should therefore be possible for UK first tier suppliers also to raise their performance, ahead of the lower tiers.

The UK industry acknowledges the productivity and quality problems in the lower supplier tiers. A collaborative initiative between the Society of Motor Manufacturers and Traders (SMMT), the UK Japanese transplants, one established UK car maker and one European car maker is working through and across supply chains to increase penetration of best practice, assisted by the DTI.

The Japanese vehicle manufacturers work with their suppliers not out of altruism but to reduce their sourcing cost. The reward for improving productivity, quality and delivery performance for a supplier is not a higher margin but increased volume. The Japanese view of an ‘acceptable margin’ for a UK based supplier is considered low by some component manufacturers, acting as a block to partnership.

¶ **Frontline skills and motivation.** Exhibits 17 and 18 show that motivation levels, as measured by absenteeism and contribution to company suggestion schemes, are lower in the UK compared with Japan. However, once again there are differences between the Japanese transplants and the established operations. We have observed that the skills and motivation levels of staff in some established plants are a major barrier to productivity improvements. We should stress that we believe that this is largely because of a failure to adopt best practice management processes, a lack of appropriate training and the legacy of past attitudes and relationships, rather than any intrinsic issues about the UK workforce at large.

Most people within the industry, including the companies themselves, acknowledge that a key element of the new greenfield sites’ success has been the ability to select staff with the right skills and attitudes for best practice operations. Nissan attributes a great deal of its success to the culture it has engendered among its staff. When recruiting new staff, Nissan tests for basic skill levels such as numeracy to support statistical problem solving. The company also involves in the selection process supervisors who ‘know the right attitude when they see it’. In addition Nissan has developed a two year training programme for school leavers who wish to become manufacturing staff, where they are trained in the company culture and disciplines as well as technology. Some component suppliers, such as Pianoforte, have also developed relationships with local education establishments in an effort to develop their future talent.

In many of the established plants the skills and attitude of the existing workforce at all levels form one of the largest barriers to implementing best practice operations. One established operator, when moving to a team based structure, found that only 25 per cent of its existing supervisors had the right attributes for the new role. When setting up a new facility, the same company asked for volunteers from the existing workforce who were keen to learn the new approach. They then selected from the volunteers and found that they could readily implement best practice organisation of functions and tasks.

The example of the transformation of NUMMI in the US is often quoted as an instance of implementing best practice in an existing workforce. However in that case, the process was led by Toyota managers with expert knowledge of best practice processes and access to detailed internal benchmarking data. Perhaps more importantly, the workforce had endured two years' unemployment, a period almost certainly sufficient to raise their motivation and enthusiasm for the new 'job restoring' techniques. Other examples, such as the turnaround at Porsche, while more representative of a true brownfield turnaround, sadly illustrate that a crisis of survival is often necessary to generate improvements. Unipart, however, stands out as an example of a brownfield turnaround. Unipart was once the poorly performing component subsidiary of BL but is now an acknowledged leader in lean manufacturing techniques. Unipart places great emphasis on staff training and development at its increasingly famous Unipart "U".

Companies like GM have proved that they can match world class performance and implement best practice when establishing greenfield operations, like GM's Eisenach plant, but they cannot yet replicate this in their older plants (Exhibit 19). Most people agree that the key differentiator is managers with detailed knowledge of best practice, well designed processes and an appropriately trained and motivated workforce rather than the actual plant itself: one of Nissan's older plants in Japan can match the productivity of its newer operations.

Established operators in the UK automotive industry face a significant challenge creating the necessary cultural change throughout their workforce, from managers to manufacturing workers. They also lack access to the detailed knowledge and data built up over 40 years by their Japanese competitors. Undoubtedly companies should have started this process sooner; in some cases transformation programmes began only a few years ago. The UK, however, has plenty of people with the right attributes and even if they lack skills initially, they are readily trainable, as proven by the Japanese transplants.

West Germany undoubtedly has a higher level of vocational skills amongst its automotive workforce, compared to the UK, due to the three-year apprenticeship system it continues to operate. This equips workers with a high level of technical skill, and this has historically provided West German companies with a productivity advantage. However, modern manufacturing techniques rely less on specific vocational skills and more on flexibility, team working, problem solving and attitudinal characteristics. US and Japanese manufacturers have surpassed West German productivity using these techniques, and avoided creating the inflexibility that very job specific skills can create.

¶ **Matching capacity to demand.** New production capacity of over 1 million cars has been opened in Europe in the last 10 years and no old plants have yet been closed. This is in direct contrast to the US where production capacity of over 2 million cars has been shut down. Historically, Ford in particular has been ruthless in matching capacity to demand in the US, compared with Europe (Exhibit 20). However, in the last two years Ford has aggressively increased volumes at its Dagenham plant in the UK, raising capacity utilisation to around 90 per cent in 1997 and achieving substantial productivity improvements.

In 1996 UK vehicle manufacturers operated at about 74 per cent of maximum capacity on average, whereas the US operated at nearly 90 per cent. Most people in the industry agree that down to about 70 per cent capacity it is difficult to adjust manning levels correspondingly. At times in the early 1990s UK manufacturers operated a four day production week to cope with slack demand. It is to be hoped that the recent announcement of a four day week at Ford’s high performing Dagenham plant is only a temporary set back.

¶ **Value added within category mix: Innovation**. One area of primary concern in the UK supplier base is the relatively low level of spending on research and development when compared with Japanese and West German companies (Exhibit 21). Increasingly, vehicle manufacturers expect suppliers to undertake complex R&D projects on their behalf. Indeed, many product innovations in cars have come from suppliers, such as anti-lock braking systems and stability control systems. An assessment of technological innovation capability is an increasingly important part of an OEM’s evaluation of suppliers. Innovation therefore drives growth and in turn, allows further improvements in productivity. A virtuous cycle is created with productivity improvement then funding further innovation.

Of course absolute spending is only one guide to the innovative potential of companies. How the money is spent is often as important as how much there is. As mentioned earlier ‘platforming’ is becoming increasingly important in development of new products. Many car makers are building future products using shared components and modules, shared production and assembly facilities, all developed by a wider platform team including suppliers and internal product, process and service engineers. But platforms are not just the preserve of OEMs. Component suppliers are also aiming to “engineer to perfection” common components and then provide distinctive component offerings to the different OEMs. Were the UK company’s lower spending in R&D to be offset by greater efficiency, in platforming for example, the potential innovation ‘gap’ would be less worrying. However, no such evidence is available, so it is possible that without an increase in research and development and the innovation of new technologies and solutions, UK suppliers will increasingly lose business to foreign competitors.

Factors of secondary importance

Factors of secondary importance in comparing UK and Japanese productivity are capital intensity and technology. Product mix and complexity are also of secondary importance versus the US. Scale is of negligible importance.

¶ **Capital intensity and technology.** Most of the UK vehicle assembly and manufacturing plants have now invested in automation in line with international benchmarks. Rover is a possible exception, having been starved of investment during the late 1980s and early 1990s. The degrees of freedom in choice of technology are limited. One area of difference, however, is the use of robots which provide flexible automation to cope with product complexity. As shown in Exhibit 22, Japan uses more robots to cope with complexity created by its export orientation. European and US manufacturers use more fixed automation and fewer robots. However, whereas this is not a problem in the US because production is mainly for domestic consumption, European manufacturers have a level of product complexity similar to Japan’s.

Capital intensity is low in UK component manufacturing. Evidence suggests that this is due to the lower cost of labour in the UK, encouraging the substitution of labour for capital. Japan has greatly increased capital intensity in component manufacture in recent years, compared with the UK. However, the UK has still achieved a higher growth in total factor productivity (Exhibit 23). This suggests that the present level of capital intensity is not seriously inhibiting total factor productivity growth. People involved in the industry also agree that there is substantial scope for improvement in operations, before capital constraints on productivity are reached.

¶ **Product mix and proliferation.**

- *Product Category Mix*. All three comparison countries produce a higher value mix of vehicles than does the UK, thus lifting productivity. Like Japan the UK produces a high proportion of small and medium range cars. However the UK lacks a mass luxury vehicle manufacturer such as Lexus. A significant proportion of West German production is at the very top end and the US also produce a high number of large cars as well as high value sport utility vehicles.

- *Product proliferation*. Products in the UK are more complex than those in the US, because the high export orientation leads to many model variants. Component manufacturers in the UK are also in general dealing with more customers because the vehicle manufacturing sector is more fragmented. This significantly adds to complexity, compared with plants in the US or Japan which sometimes have only one or two customers. However, as modern manufacturing techniques are designed to be flexible enough to cope with complexity we believe this has limited impact on productivity.

¶ **Scale.** In all cases except Ford, the average UK plant size is below the parent's average size in Japan or the US. However, it is difficult to see scale as a differentiator if the UK vehicle manufacturing plants are compared. Two of the smallest, the new plants built by Honda and Toyota, are also two of the most productive. Japanese production processes enable high productivity even in low volume plants. Even within companies, it would appear that there is little correlation between scale and productivity, at similar levels of utilisation (Exhibit 24).

Industry dynamics

Factor of primary importance

The most important factor in explaining the productivity gap from an industry dynamics perspective is the degree to which a country has been exposed to competition from best practice, which in this case is Japan.

¶ **Competition with best practice, vehicle manufacturing**. As the home of best practice manufacturing techniques, Japan has clearly had the longest and greatest exposure. In addition, in defiance of MITI, nine automotive manufacturing companies were established in Japan, creating intense domestic competition.

Both the US and UK product markets have been exposed to best practice since the early 1970s. However Exhibit 25 shows that Japanese market share in the US grew far more rapidly. The Japanese came to the US with a distinctive product which was smaller, more fuel efficient and higher quality than the cars produced by the US Big 3, Ford, Chrysler and GM. In particular the oil crisis of the 1970s provided a tremendous boost to Japanese competition. As a result, Japanese share rapidly grew to 26 per cent and the established manufacturers were suffering severe financial pressure by the early 1980s. In order to survive, the Big 3 took radical action including closing the least productive plants, entering into joint ventures and alliances with the Japanese to learn best practice, developing new products and confronting the powerful Union of Automotive Workers to introduce worker flexibility.

In contrast, in Europe the situation was not nearly so desperate for the established manufacturers. Europe already had a large number of manufacturers of small and compact cars. Many of these companies were either state owned or strategically supported by government controlled banks. European consumers were distinctly nationalistic in their choice of vehicle, in contrast to the Americans who were ‘fed up’ with the poor quality produced by the Big 3. Finally, the slow but steady growth in Japanese share was capped at around 11 per cent by the introduction of the ‘EU Voluntary Restraint Agreement’ (VRA) in the late 1980s. This agreement and import tariffs have ensured that the market share of most of the main players in Europe has been constant for the last 10 years (Exhibit 26).

This does not mean, however, that the UK market has not been competitive over the last 10 years. Ford in particular has lost over 10 per cent market share since 1986. However, competition has come from other high cost domestic European manufacturers rather than the Japanese. Ford and Rover have both lost share in the UK, but more or less maintained manufacturing volumes by increasing exports to other EU countries, covered by the VRA.

In response to the imposition of both tariffs and import restraints in the US and Europe, the next natural step for the Japanese was to establish manufacturing bases locally. As can be seen in Exhibit 27 the Japanese manufacturers targeted the US first, as the larger market. The first Japanese plant was opened in the UK five years later. The arrival of domestic Japanese competition provided a new impetus for improvement among US and UK companies. With no import tariffs and less currency exposure the Japanese were now better able to exploit their cost advantage. In addition, the Japanese proved that it was possible to implement best practice and achieve world class productivity with the US and UK workforce. Exhibit 28 shows a period of sharp increase in labour productivity in both countries three to four years after the arrival of the first Japanese plant.

¶ **Competition with best practice, automotive components.** The main driver for productivity gains in automotive components has been the Japanese transplants. A relatively small number of Japanese component companies have established UK based operations to supply the Japanese transplants. Nevertheless, having observed the much greater influx of Japanese component firms into the US, UK component companies knew that they would face this competition if they did not raise standards. It is therefore exposure to best practice via the vehicle manufacturers and the threat of substitution by best practice foreign competitors that have led to improvements in the first tier component supply base.

As the UK is slowly building its own group of best practice plants these businesses are able to compete more aggressively to gain new business, thereby forcing non-best practice firms to improve. Indeed, the relatively small Japanese vehicle plants use the promise of being ‘their supplier’ to induce component firms to give them prices not otherwise justified by their scale of purchase. However, this effect takes time to spread throughout the industry. Similarly the first tier suppliers are just starting to use supply chain pressure to push best practice down into the lower tiers and US experience suggests that this will be a slow process.

Factor of secondary importance

The industry dynamics factor of secondary importance is domestic competitive intensity. Although this has been high in Europe over the last decade, it has generally been between similarly high cost companies. The basis of competition has largely been model design and innovation. In the US the dominant position of the Big 3, and in particular GM until the 1970s, provided little incentive for productivity improvement. Meanwhile in Japan, intense domestic competition was, initially at least, the driver for productivity gains.

External factors

Factors of primary importance

The most important external factors in explaining the productivity gap include the relative cost of labour in the different countries, trade barriers which have artificially restrained competition with best practice in the UK, and government intervention and ownership.

¶ **Relative labour cost**. Low labour productivity can sometimes be partly a matter of choice. In the UK the labour cost in the automotive industry is relatively low, particularly compared with West Germany (Exhibit 29). The productivity comparisons made earlier showed that the UK's total factor productivity was not far behind West Germany's for the total automotive sector. West Germany's higher labour productivity is in part a result of a substantially higher level of capital input, due to high labour costs. West Germany's high labour cost and low productivity make it a very expensive manufacturing location.

¶ **Trade barriers.** Both the US and the EU have used a combination of a Voluntary Restraint Agreement (VRA) with Japan and import tariffs to protect their domestic industry from competition. However, in the US, Japanese market share had already reached over 20 per cent before the VRA was negotiated and import tariffs of 25 per cent are only imposed on light trucks and sport utility vehicles, not cars. In addition the Japanese built up their local production capacity in the US earlier and faster than they did in Europe. Overall, therefore, the impact of US trade barriers in restraining competitive intensity has been minimal, except in the light truck sector.

In Europe there are a number of written and unwritten agreements which restrain competition with Japan. In 1991 the EU negotiated a Voluntary Restraint Agreement with Japan which capped the number of vehicles that could be imported into five key markets, namely France, Italy, Spain, Portugal and the UK. In addition a cap was agreed on the Japanese share of the total EU market. West Germany does not have a specific annual quota but the total EU cap acts as an implicit quota, given the size of the West German market. There is also believed to be an unwritten understanding limiting the Japanese share of the West German market to 15 per cent, which pre-dates the VRA. In addition to the above, the EU imposes import tariffs of 10 per cent on passenger cars and 25 per cent on light trucks. Finally, there is believed to be an agreement in place limiting Japanese local production to 1.2 million units.

As Exhibit 30 shows, the quotas have successfully restrained Japanese competition in the capped markets, compared with those where there is little or no barrier. One interesting point is the loss of market share by the Japanese in the unrestrained markets between 1992 and 1996. This represents a fight back on the part of European manufacturers such as PSA, Volvo and Volkswagen, as well as the entry of the Koreans who have taken 1-2 per cent of most European markets. In addition this loss of share coincided with a period when the yen was strengthening against all currencies, reducing the Japanese manufacturers' ability to compete on price. The VRA expires in 1999 and will not be renewed and there are different opinions as to the impact of Japanese competition thereafter.

¶ **Government intervention**. During the 1970s and 1980s most of the major European vehicle producing countries gave massive amounts of aid to their domestic car industries to support their modernisation and survival. The UK was no exception and between 1973 and 1988 supported what is today Rover group with £3.4 billion of state aid. This government support had the effect of ensuring the survival of some of the least competitive production capacity and removed any urgent need to improve.

In 1989 the EU drew up a framework under which state aid could be given. This allowed help to ailing companies as part of a ‘one-off’ restructuring of the business which had to include an element of capacity closure. However, it continued to allow for aid for new capacity or extensions if they were in designated development areas, provided companies could prove that an alternative more economically attractive location existed. In particular, plants in development areas are sometimes still allowed to receive aid for modernisation if the alternative is to close the plant and build new or extend elsewhere. This has allowed plenty of scope for governments to continue to support their domestic industry as well as encouraging foreign direct investment for new capacity. Government aid has therefore contributed to the European over capacity situation which is depressing productivity.

Factors of secondary importance

The external factors of secondary importance in explaining the productivity gap are product regulation, remaining labour market inflexibility due to unionisation, fiscal and macro-economic environments and education.

¶ **Product regulation**. Product regulation on safety and the environment is fairly uniform across the countries we are considering. Nevertheless, these regulations currently prevent competition between trading blocks. The vehicle type approval regulations in the UK make it impossible for large numbers of Japanese right-hand drive cars to be imported into the UK, whether as new or as used cars. Should this regulation be changed, possibly as a result of legal action currently being taken by independent traders, then competitive pressures in the UK would intensify considerably. New and used car prices could drop (although consumer gains would in many cases be lost in the short term as the value of their existing cars would also fall).

¶ **Industrial relations**. As shown in Exhibit 31, union membership has declined in the UK automotive sector. In addition the industrial relations environment has improved dramatically since the late 1980s (Exhibit 32). There are now non-union plants, such as Honda's at Swindon, as well as single union plants such as Nissan Sunderland. In general all companies are now dealing with a far smaller number of unions than in the 1980s. Furthermore, the remaining unions can often act as an important channel in communicating with the workforce and persuading individuals of the need to change. However, they can also end up defending the status quo rather than pressing for change, in the justifiable pursuit of job security for their members. To overcome this issue Rover, for example, recently took a number of its shop stewards on a tour of best practice facilities to persuade them that managers were asking for no more than competitive parity, in terms of new working practices.

In Japan the major battles with the single company unions were fought many years ago. The 'jobs for life' policy for official Japanese workers has led to a largely harmonious industrial relations climate. In the US some non-union plants have opened, particularly in the Southern states. However the Union of Automotive Workers remains a formidable force, as seen in the GM strikes this year and evidenced by the relatively high wages paid to automotive workers. The West German government endorses a more rigid set of labour market rules than the UK's, contributing to higher costs and less flexibility.

¶ **Fiscal and macro-economic environments.** The yen has appreciated greatly versus the dollar since the early 1980s (Exhibit 33). Although recently this trend has been reversed, during this period the strong yen made it essential for the export dependent Japanese car industry to increase productivity. The following quotation from Toyota's 1994 annual report epitomises the Japanese attitude to unfavourable external economic environments: '*Manufacturers needn't be helpless in the face of economic developments. They can and should take their destinies into their own hands. To do that we at Toyota devote ourselves to managing costs.*'

¶ **Education.** All companies agree that the low quality and quantity of graduate engineers who apply to the automotive industry in the UK is a problem. A 1996 graduate survey from top engineering schools showed that the automotive industry was the most attractive for West German graduates, but only fifth for UK graduates behind, for example, pharmaceuticals and management consultancy. Similarly, BMW, Mercedes, Bosch, Siemens and VW all featured in the 'ideal employer' top ten in West Germany. Peugeot and Renault are in the top four in France, Fiat is top in Italy but the highest representative in the UK, Ford, comes ninth.

Factors of little or no importance

Factors of little or no importance in explaining the productivity gap are other industries up and down stream and the relative cost of capital.

- **Other industries upstream and downstream.** Vehicle manufacturers' and component suppliers' performance affect each other, up and down the supply chain, with a significant impact on productivity.

  With regard to automotive retail, the current exemption from EU competition law granted to the car industry allows manufacturers to control channels to market and, some think, to influence prices. Many believe that this helps to maintain high prices in the UK and restricts the competitiveness of new entrants, and there is evidence to support this view. However, both the US and Japan also have somewhat restricted retail markets. In the US, the situation is similarly controlled by the manufacturers, as all new cars have to go through a small number of approved distributors. In Japan, the high cost and limited availability of land make it similarly difficult for importers to establish dealer networks.

  It is therefore not the case that comparatively a lack of competition in the retail market contributes to the productivity gap. However, there is no doubt that free competition in European retail markets would increase competitive intensity and therefore the pressure on European manufacturers to improve productivity.

- **Cost of capital.** Within the UK automotive industry the high cost of capital is an issue mostly for SMEs in the component sector. Cash flow problems caused by late payment through the supply chain exacerbate this problem. If SMEs did not have to borrow to fund extended credit periods they might be able to make investments to raise productivity. However, even at current levels of capital intensity, firms are able to raise productivity substantially by improvements in operations.

FUTURE OUTLOOK AND RECOMMENDATIONS

Future outlook

The long term existence of the automotive industry in the UK, on any meaningful scale, is dependent on achieving globally competitive productivity. The UK no longer has a domestically owned mass vehicle manufacturing industry; although the UK still has some large domestic component producers, a process of global consolidation is also taking place in this sector which could result in more of these companies gaining foreign parentage.

Europe is currently operating with overcapacity of 5 million cars and new plants are still being built. Even if the most buoyant, and probably overstated, demand forecasts are to be believed, overcapacity will still be 3-4 million cars by 2002. As in the US, a programme of plant closures is ultimately inevitable. The labour market reforms of the 1980s have made it much easier for pan-European car makers to close (as well as open) plants in the UK than in other European countries. The current strength of sterling and the doubts concerning the UK's participation in EMU are already contributing to producers' decisions to switch production away from the UK. The UK consumer is possibly one of the least nationalistic of all European car buyers, with imports as a percentage of sales currently at 62 per cent and growing annually. All this means that the established UK plants will have to be even better than their European counterparts if they are to survive in the long term.

These pressures will also increase as a result of EMU. The introduction of the Euro will create transparency of prices for consumers, inevitably leading to some erosion of margins, and it will also create transparency of cost performance in the production base. Both these pressures will force plants everywhere to improve their performance and plants in the UK, although outside the Euro zone for the time being, will also have to redouble their efforts if they are to remain attractive production locations.

On the positive side, all of the Japanese producers in the UK plan to increase production, lifting output to 600,000-700,000 cars by the year 2000. Rover, the largest car producer in the UK, is set to launch a new generation of vehicles allowing it to improve production processes and utilisation, provided the products are successful. GM has also announced increases in production in the UK and Ford's Halewood plant is in transition to become a Jaguar plant offering the chance to prove that UK plants can build high volume premium cars as well as anywhere else.

There can also be no doubt that the UK can achieve world-class performance, thanks largely to the Japanese transplants. This, combined with low cost and flexible labour, makes the UK an attractive location for further inward investment. Labour productivity in the UK components industry is currently showing greater growth than in the US or Japan, and a network of world class first tier component plants has been established. Attention is now being paid to the lower tier suppliers in a joint industry and government initiative, which is unique internationally.

Based on the above we have developed a number of possible scenarios for the development of the UK automotive sector over the next five years.

¶ **Base scenario**

In the base scenario the sector continues in much the same way as today. Output grows in line with manufacturers' forecasts. This means a substantial increase by the Japanese, a decrease by Ford as production at Halewood is switched over to Jaguar, a substantial increase by Rover as the new models are successfully released, planned increases at GM and modest changes at other manufacturers. Output in the components sector grows in line with the vehicle manufacturing sector. Labour productivity in each sector continues to grow at the rate it did between 1990 and 1995.

¶ **Upside scenario**

In the upside scenario output at all plants reaches close to maximum capacity. This could happen if Ford and Vauxhall close plants elsewhere in Europe and if Rover's new models are very successful. Output in the components sectors grows at a rate 50 per cent higher than vehicle manufacturing. For this upside case to be realised, labour productivity in the UK would have to improve substantially over the next five years. This scenario assumes that by 2002 labour productivity has reached 75 per cent of the Japanese level.

¶ **Downside scenario**

The downside scenario assumes that three of the mass vehicle manufacturing plants in the UK are closed in response to the chronic overcapacity problem in Europe. Output at the other plants grows in line with manufacturers' forecasts. Output in the component sectors grows in line with vehicle manufacturing. Labour productivity for the remaining plants continues to grow at the rate it did between 1990 and 1995.

¶ **Output, Employment and Productivity for each Scenario**

Exhibit 34 shows the results for output, employment and labour productivity under each scenario and therefore provides a range of likely outcomes for the sector going forward.

Note, however, that these calculations assume that output in the vehicle manufacturing sector is capped at the current maximum installed capacity in the UK, plus the planned expansions. Clearly one could also include a new plant in the upside case and further inward investment is a possibility. In recent years the components sector in the UK has actually been growing faster than the vehicle manufacturing sector. The base scenario is therefore somewhat conservative, in assuming that growth in components only matches that of the vehicle manufacturing sector.

In no scenario does employment grow beyond current levels, because of the assumption that a prerequisite for output growth is continued improvement in labour productivity. The largest decline in employment is seen in the downside scenario, but even the base scenario shows a reduction in employment levels.

In terms of labour productivity, in all scenarios the UK closes the gap with Japan. This is because the average productivity growth rate between 1990 and 1995 has been greater in the UK than in Japan. In the downside scenario, labour productivity increases by more than in the base scenario for vehicle manufacture because we assume that the least productive plants close. However, the gap with Japan is very large. The upside scenario requires productivity increases of 10 per cent per annum for five years. In the base scenario it would take at least another 30 years to close the existing gap with Japan for both vehicle manufacturing and components.

Recommendations

Improvements in labour productivity will greatly enhance the automotive industry's prospects. Only the industry itself can actually deliver these improvements, through continuous improvements in manufacturing efficiency combined with innovation. However, there are a number of things policy makers can do to encourage and support this activity:

¶ **Maintain flexible labour market rules.** Some people within the industry are concerned that greater links with mainland Europe will ultimately result in more restrictive labour laws in the UK. High productivity relies on flexible working. In 1994 the average worker in the West German car industry worked 77 per cent of the hours of a UK worker and 65 per cent of the hours of a US worker. Restrictions on working hours in Germany combined with job demarcation are a significant barrier to increasing productivity – something now becoming more apparent to the Germans themselves as even German companies grow their non-German production bases. Any move towards similar rules in the UK would limit the potential for productivity and output gains.

¶ **Maintain stable macro economic conditions.** Given the overcapacity, another major recession would seriously damage the UK automotive industry.

¶ **Ensure the VRA is removed in 1999.** The current Voluntary Restraint Agreement with Japan expires in 1999. Currently there is no intention to renew or extend this. The Government should also continue to ensure that markets such as Korea are fully open to imports from the UK, without prohibitive tariffs.

¶ **Review the EU policy for grants to the automotive industry.** The current guidelines on EU aid still implicitly perpetuate and exacerbate the overcapacity problem. In addition they diminish the sense of urgency among workers and managers, that failure to improve will result in closure. To generate high productivity, state aid packages should not be allowed to influence decisions on plant closures, expansions and new investments. If protecting employment is a higher priority, governments must understand the productivity penalty.

¶ **Continue to support industry-led activity which accelerates the transfer of best practice into the sector.** Most people in the industry agree that the biggest barrier to transfer of best practice is knowing how to implement change. In addition there is an inertia barrier in SMEs in the component sector which lack direct benchmarks and therefore do not perceive waste. The Government is currently supporting the 'Industry Forum' which is working to help lower tier component suppliers improve productivity. This initiative has several strengths:

- It is led and supported by the industry itself, using supply chain pressure to encourage change.
- It uses globally acknowledged best practice exponents to train other engineers who work directly with companies. This creates a 'cascade' effect throughout the industry.
- The help it offers is very practical and hands-on, teaching 'how to' as well as 'what'.

This model could be replicated in other manufacturing sectors.

¶ **Support industry-led training initiatives.** The automotive industry experiences skill shortages at a number of levels. Best practice firms such as Nissan address this by forming partnerships with local training colleges to develop specific skills in its future workforce. The Government needs to encourage widespread adoption of this type of partnership - for example:

- Industrial companies partnering with universities to increase the relevance of courses and to provide more students with practical experience, which may ultimately encourage them to take up the profession
- Industrial companies partnering with schools to improve the quality and quantity of technical education, for example: summer schools for teachers aimed at educating and motivating these influencers; on site, practical teaching for school children.

¶ **Continue fiscal support for R&D activity.** Raising manufacturing efficiency must be a priority for the UK automotive sector. However, this should not be at the expense of product innovation. Some highly productive Japanese companies are suffering financially, because of lacklustre product design. In particular, component producers are increasingly expected to undertake R&D for new model development. The major UK component companies spend less on R&D than the most highly regarded foreign competitors. In the future the most globally competitive companies will combine high productivity and innovation.

* * *

To achieve a genuine lift in the productivity and output of the automotive manufacturing sector, Government, the unions, the workforce and above all the industry itself must act. If these stakeholders act together we believe that the UK has the potential to significantly improve the productivity of its automotive base.

Appendix: Methodology for productivity calculations

To compare the performance of the UK automotive sector with that of other countries we investigated output, labour and capital inputs, and labour and capital productivity.

¶ **Output**

For an output measure we used Gross Value Added by manufacture. We adopted the US and Japanese definition for this, which is factory gate sales value minus raw material purchases (including outsourced work). This means that we adjusted the gross value added figure in the UK and West German Census of Manufacturers to add back 'Non - Industrial Services' (primarily rent and rates).

To convert all output measures into US dollars we used an 'auto - specific' PPP. This is necessary because of pricing differences between the four countries. Put simply, the PPP corrects the gross value added in each country to reflect the prices the equivalent output would have achieved, had it been sold in the US. The methodology for calculating the PPP is outlined below:

- The first step is to calculate the average factory gate sales price for vehicles in each country.
- Clearly different countries produce very different mixtures of vehicle models. A 'like for like' comparison requires adjustment of the average vehicle price in each country, to what it would have been, had the output been the same mix as in the US. This is done by calculating a 'mix adjustment factor'. An industry report by DRI segments car production in a country according to value as A, B, C1, C2, D1, D2, E1, E2, where A is the least valuable. A similar segmentation can be applied to light trucks. The McKinsey Automotive Practice has calculated an average segment value weight for each of these classifications (A=5, B1=7, C1=10, C2=13, D1=15, D2=25, E1=30, E2=33). Using the DRI segmentation and the value weights we calculated an average output value for each country. We then divided the average sales price by the average output value for each country and finally multiplied this by the output value for the US. This gave us the sales price for each country at the US output

mix. The mix adjustment factors for 1995 calculated using this methodology are US = 100, West Germany = 112, Japan = 96, UK = 86.

- We then calculated the mix adjusted PPP by dividing the mix adjusted price in each country by the price in the US. We divided the value added in each country by the mix adjusted PPP to convert to US dollars.

- We made one further adjustment to the value added. It is conceivable that cars made in certain countries would attract a price premium (or discount) in the US because of tangible differences in quality. The McKinsey Automotive Practice has conducted a detailed conjoint analysis which provided the content and quality adjustments for Japan and West Germany in the US. For the UK, we calculated this content and quality adjustment in the following way. We selected a model sold and manufactured in the UK and the US. We adjusted the price of the UK car so that it had the same content (sun roof, air bags etc.) as in the US. We compared the premium paid for this model in the UK, over the segment average price, with the premium paid in the US. We then calculated the adjustment to the UK price to reflect the premium paid in the US (i.e., the ratio of the US premium to the UK premium). We repeated this calculation for 2-3 models in each value segment. We then took a weighted average adjustment factor, according to the segment mix in the UK. We then repeated this calculation for exactly similar models imported to both the UK and the US (although in this case there was no need to adjust for content). We then took an average of the two results for the domestically built and imported model method. The quality and content adjustment factors applied are US = 100, West Germany = 105, Japan = 106, UK = 102.

- Finally, we multiplied the value added in US dollars in each country by the quality adjustment, to reflect the additional value due to tangible quality differences.

¶ Labour Inputs

We calculated the number of hours worked in the sector in each country. In some countries this is recorded directly in the Census of Manufacturers. For the UK, only employment numbers are recorded so in this case we used the average hours worked per employee from an industry survey to calculate the total annual hours worked. In West Germany and the UK, employment figures include ‘auxiliaries’, e.g., staff at R&D establishments. We therefore corrected the US employment data so that it also included auxiliaries. We did not correct the Japanese data. This means that our productivity comparisons are always West Germany and UK to US (including auxiliaries), and US (excluding auxiliaries) to Japan. In other words we have used the US as a 'bridge' for the other two countries to make the comparison with Japan.

¶ **Labour Productivity**

This is defined as 'output divided by labour input' according to the definitions above.

¶ **Capital Inputs**

The average annual capital services cost for a year was calculated as follows. We determined the new capital expenditure on plant and equipment for the 12 years up to and including the year in question. Assuming a service life of 12 years, the annual servicing cost in this year is the sum of $1/12^{th}$ of the new capital expenditure for each of the preceding 12 years. We repeated the procedure for capital expenditure on new structures, using a service life of 31 years. We used the OECD PPPs for 'machinery purchases' and 'civil engineering' to convert to US dollars.

¶ **Capital Productivity**

This is defined as 'output divided by capital input', according to the definitions above.

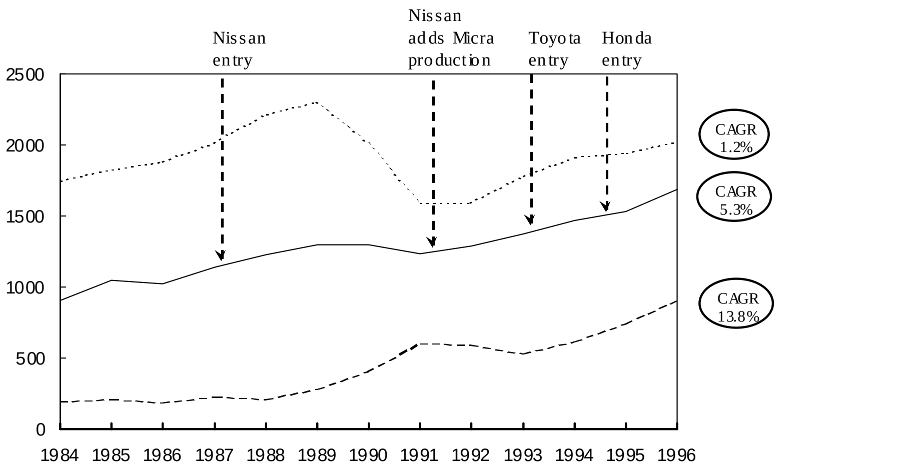
¶ **Total Factor Productivity**

Total factor productivity is a measure which combines labour and capital productivity, using the Cobb Douglas function, to assess how efficiently countries use each unit of input to produce output.

Exhibit 1

U.K. PASSENGER CAR DEMAND AND PRODUCTION, 1984–96

000 cars

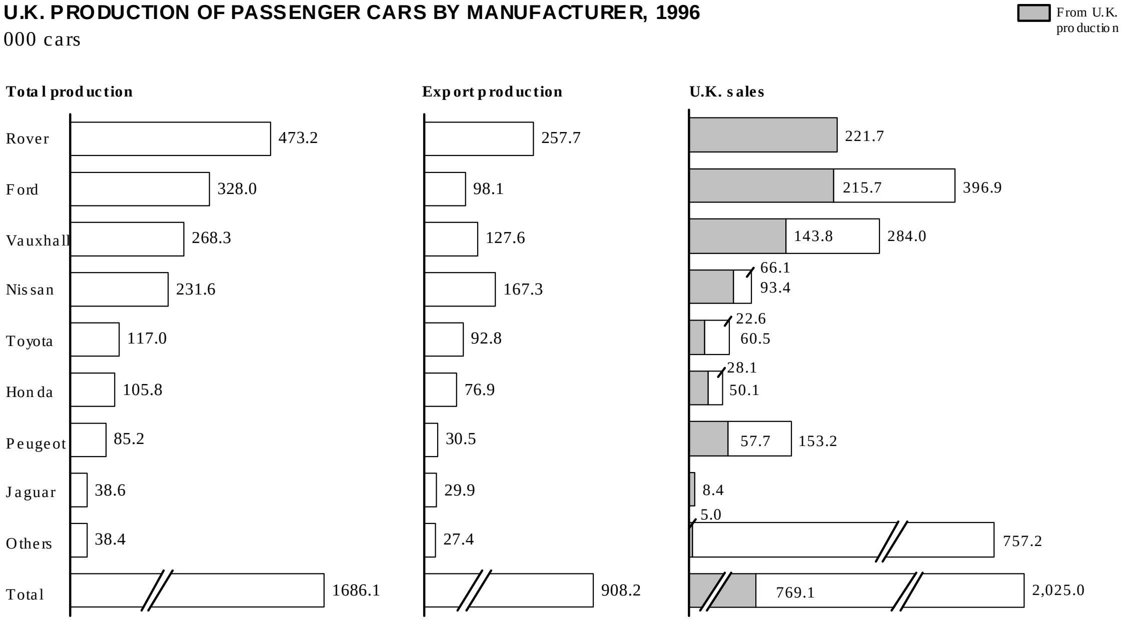


Source: SMMT statistics

Exhibit 2

U.K. PRODUCTION OF PASSENGER CARS BY MANUFACTURER, 1996

000 cars



Source: Society of Motor Manufacturers and Trades Statistics

Exhibit 3

VEHICLE PRODUCTION STATISTICS FOR U.K. AND COMPARISON COUNTRIES, 1996

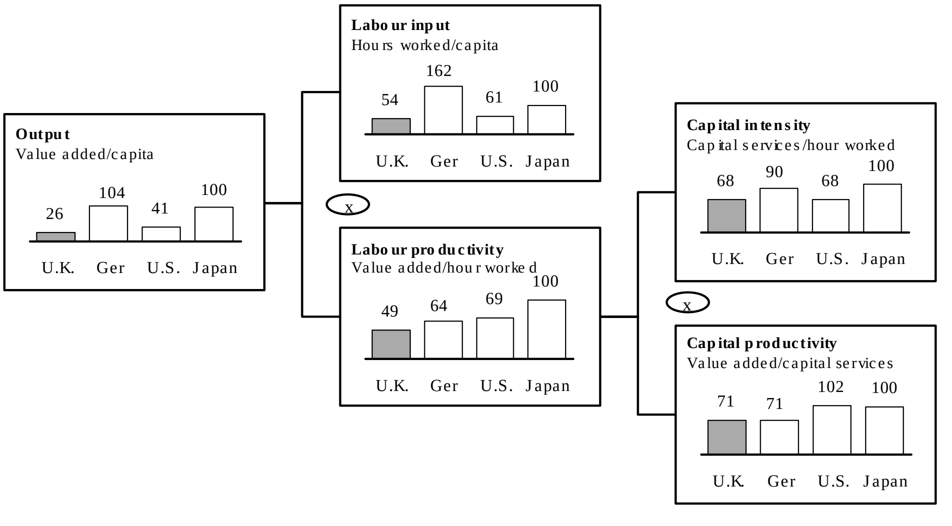
	Vehicles produced (m)	Export production (%)	National company production (%)	National company market share (%)	Japanese production (%)	Other foreign owned production (%)
U.K.	1.9	48	0.5	neg.	23	76
U.S.	11.7	~10	81.0	69	18	<1
Japan	9.8	38	100.0	93	100	0
Germany	4.7	60	63.0	43	0	37

Source: DRI world car industry report

Exhibit 4

TOTAL AUTOMOTIVE SECTOR, OUTPUT AND PRODUCTIVITY COMPARISONS

Indexed to Japan = 100

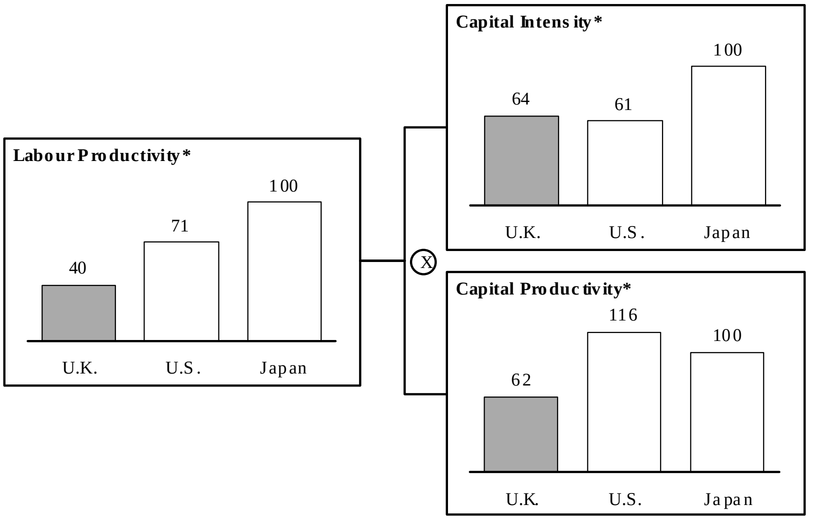


* Data is an average for years 1993–95. Value added data is converted at auto-specific PPP. Capital services is converted at OECD Investment PPPs for U.K. and comparison countries

Source: Census of manufacturers; Labour Force Survey; McKinsey analysis

Exhibit 5

PRODUCTIVITY COMPARISONS, VEHICLE ASSEMBLY SUB-SECTOR



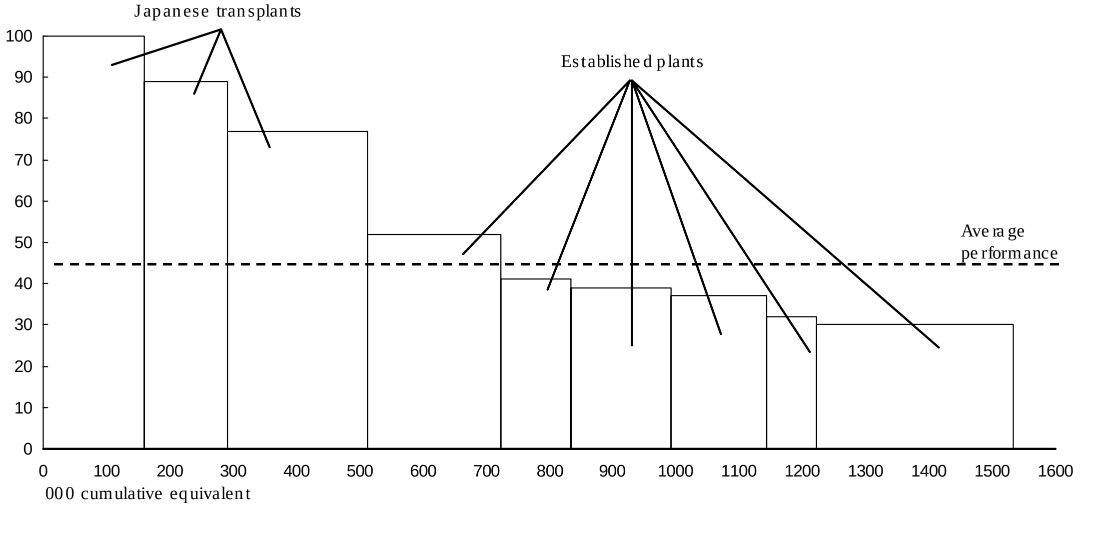
* Data is an average for years 1993–95 for U.S. U.K. and Japan. Value added data converted at auto-specific PPP. Capital services is converted at OECD Investment PPPs for U.K. and comparison countries

Source: Census of manufacturers; Labour Force Survey; McKinsey analysis

Exhibit 6

COMPARISON OF EQUIVALENT VALUE CARS PRODUCED PER EQUIVALENT EMPLOYEE FOR MAIN* U.K. OEMs, 1996

Indexed to best = 100

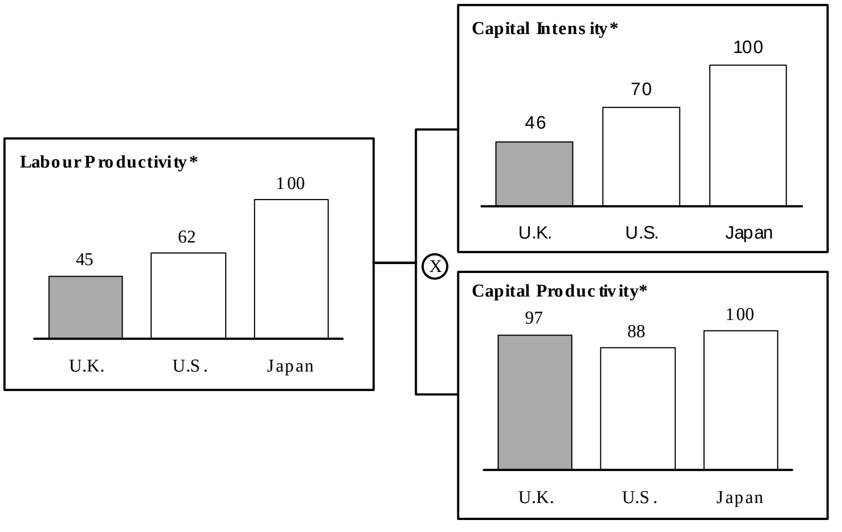


* Represents 90% of U.K. production

Source: EIU data; company accounts; DRI data

Exhibit 7

PRODUCTIVITY COMPARISONS, PARTS SUB-SECTOR



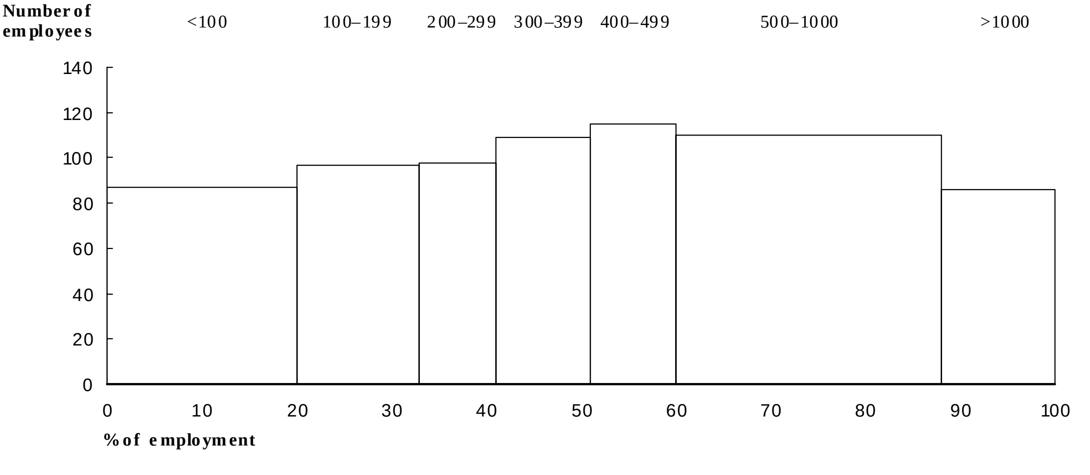
* Data is an average for Years 1993–95 for U.S., U.K. and Japan. Value added data, converted at auto-specific PPP.. Capital services is converted at OECD Investment PPPs for U.K. and comparison countries

Source: Census of manufacturers; Labour Force Survey; McKinsey analysis

Exhibit 8

LABOUR PRODUCTIVITY BY SIZE OF BUSINESS, U.K. AUTOMOTIVE COMPONENTS, 1995

Indexed to average = 100



Source: U.K. Census of Manufacturers

Exhibit 9

CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

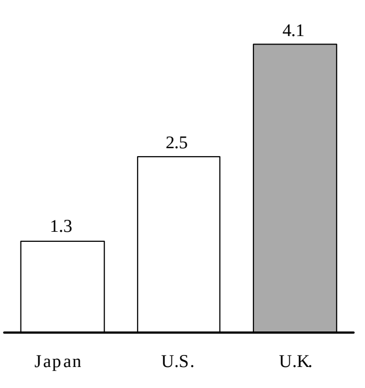
		U.K. vs. U.S.	U.K. vs Germany	U.K vs Japan
External factors	• Fiscal and macroeconomics environments	-	-	○
	• Product market			
	– Trade/FDI barriers	●	-	●
	– Product regulations	-	-	○
	• Labour market			
	– Labour rules/unionism	-	-	○
	– Relative labour cost	○	●	○
	– Education	-	○	-
	• Capital market			
	– Corporate governance/government ownership	●	-	●
	– Access to capital	-	-	-
	• Other external factors			
	– Other industries/up and down stream	-	-	-
	– Country specific factors	-	-	-
Industry dynamics	• Competition with best practice	●	-	●
	• Domestic competitive intensity	-	-	○
Production process	• Mix of products and services/marketing			
	– Product category mix	○	○	○
	– Value added within category mix*	-	○	○
	– Product proliferation	○	-	-
	– Pricing structure/marketing	-	-	-
	• Production factors			
	– Capital intensity/technology	-	○	○
	– Scale	-	-	-
	– Frontline skills/trainability	-	○	●
	– Matching capacity to demand	●	-	-
	• Operations			
	– Organisation of functions and tasks	○	-	●
	– Design for manufacturing	○	-	●
	– Suppliers and supplier relationships	○	-	●
	Productivity performance (comparison country = 100)	**71**	**77**	**49**

* Applies only to automotive components, for which it is a factor of primary importance. For the total sector it is therefore shown as a factor of secondary performance

Exhibit 10

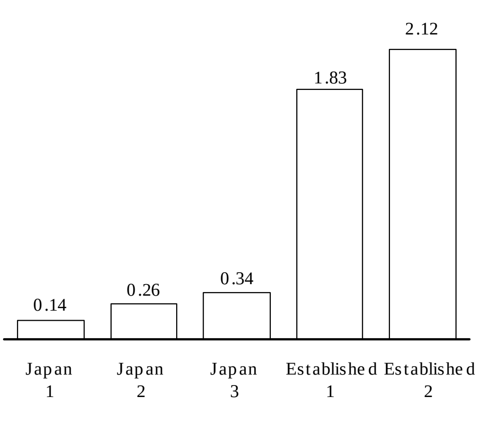
AVERAGE INVENTORY LEVELS, 1990–93, IN ASSEMBLY

Inventory* as a % of final sales



WORK IN PROGRESS FOR U.K. OEMs, 1996

WIP as a % of sales



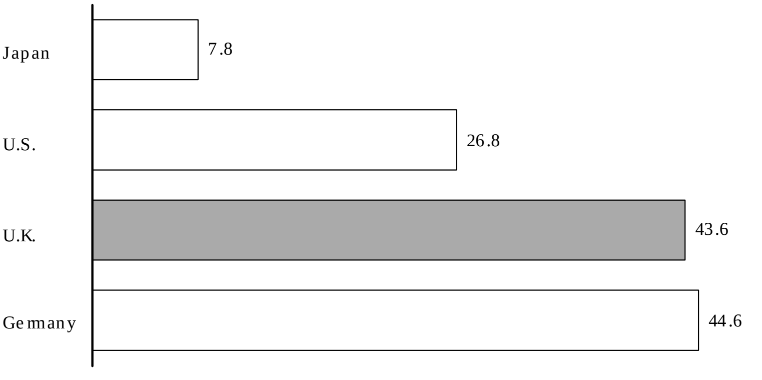
* Industry includes raw material and work in progress but not finished goods

Source: Census of Manufacturers; Company accounts

Exhibit 11

WORK IN PROGRESS INVENTORY OF FIRST TIER PARTS SUPPLIERS, 1994

Hrs of inventory

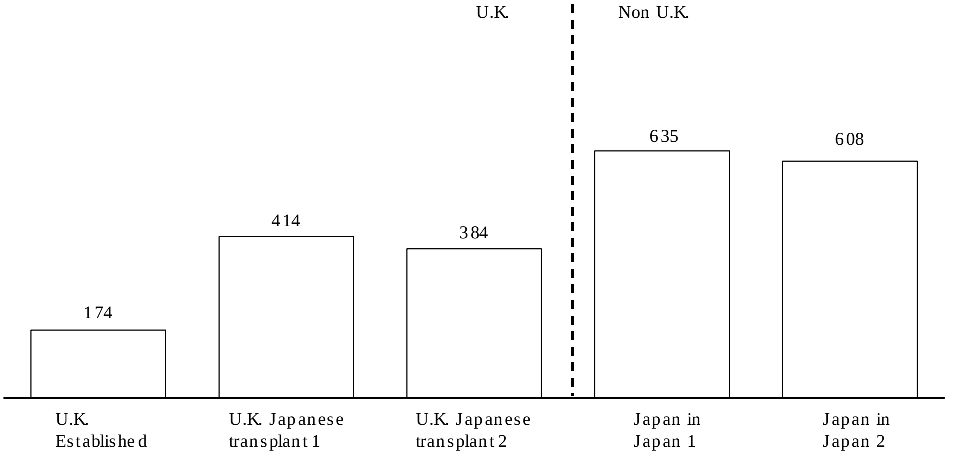


Source: Andersen Consulting

Exhibit 12

NUMBER OF VEHICLES PER INDIRECT WORKER IN U.K. OEMs AND SELECTED OTHER PLANTS, 1996

Vehicles/indirect staff member

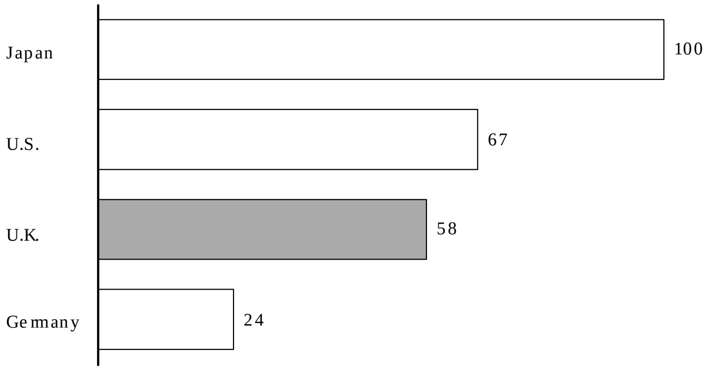


Source: EIU data

Exhibit 13

USE OF TEAMS IN AUTO COMPONENT FACTORIES, 1994

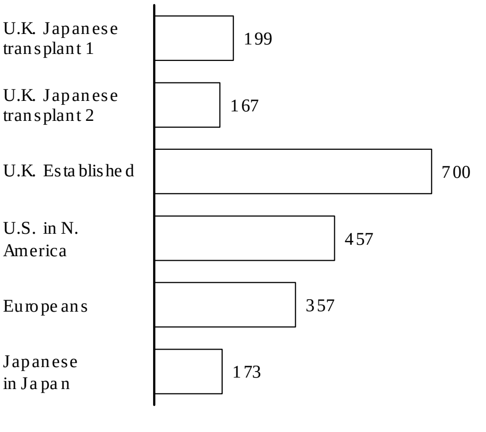
%



Source: Andersen Consulting

Exhibit 14

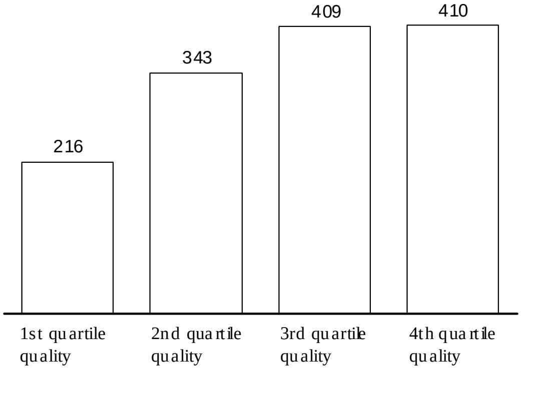
NUMBER OF SUPPLIERS TO U.K. ASSEMBLERS AND REGIONAL AVERAGES, 1993–94



Source: IMVP; Managing Change

IMPACT OF NUMBER OF SUPPLIERS ON VEHICLE QUALITY, 1994

No. of suppliers

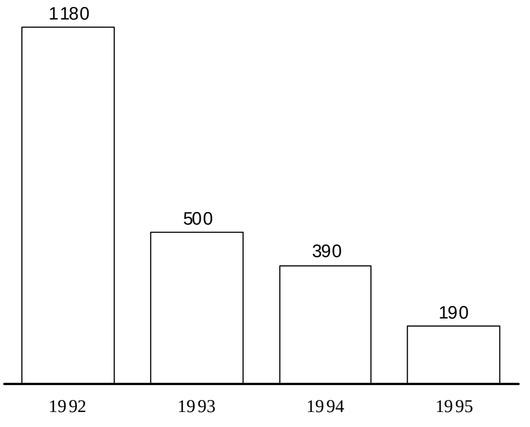


Source: IMVP; MacDuffie and Pil; JD Power Initial Quality Data

Exhibit 15

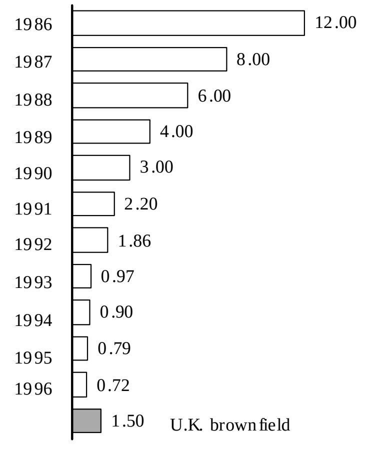
QUALITY IMPROVEMENTS IN NISSAN U.K. SUPPLIER BASE, 1982–95

Parts/million rejected



DAYS OF PARTS INVENTORY AT NISSAN U.K., 1986–96

Days

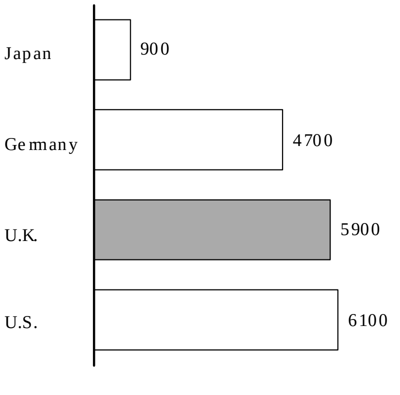


Source: Automotive News Europe; Nissan U.K.

Exhibit 16

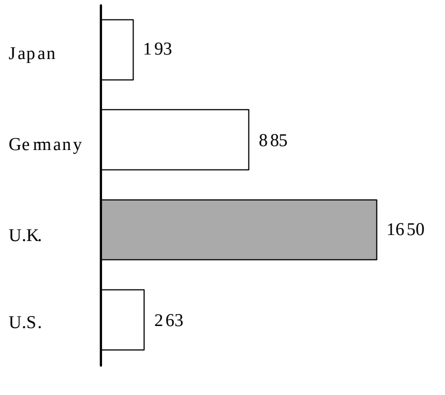
INCOMING DEFECTS FOR FIRST TIER PARTS SUPPLIERS, 1994

Defects, ppm



OUTGOING DEFECTS FOR FIRST TIER PARTS SUPPLIERS, 1994

Defects, ppm

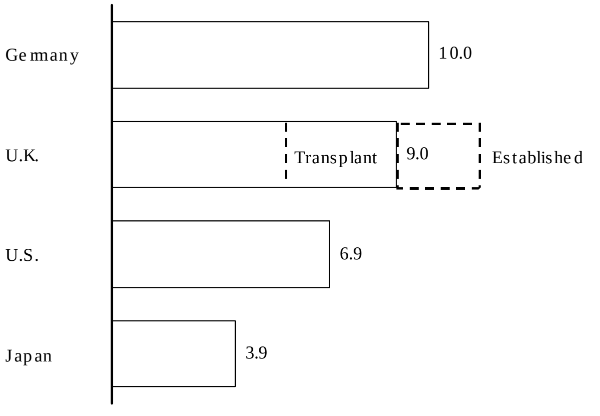


Source: Andersen Consulting

Exhibit 17

ABSENTEEISM IN THE MOTOR VEHICLE INDUSTRY, 1995

Days p.a.

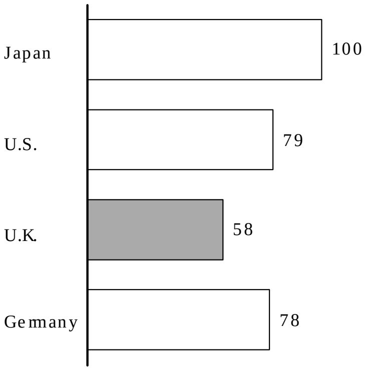


Source: VDA Survey, 1995

Exhibit 18

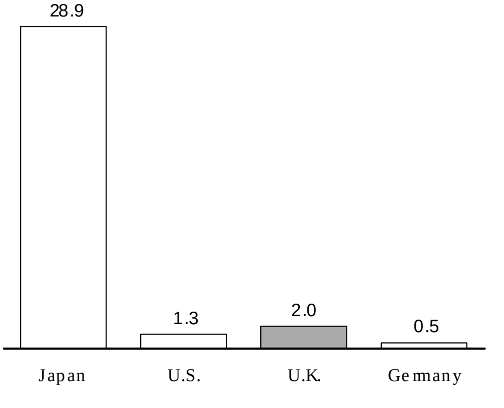
USE OF EMPLOYEE SUGGESTION SCHEMES IN AUTO COMPONENT PLANTS, 1994

%



SUGGESTIONS PER PERSON PER YEAR, 1994

No. of suggestions

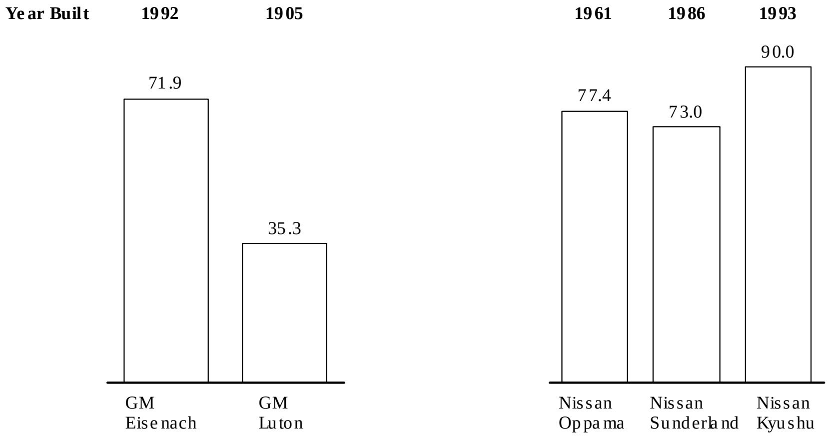


Source: Andersen Consulting

Exhibit 19

COMPARISON OF GREEN FIELD VERSUS BROWN FIELD PRODUCTIVITY IN GM, FORD AND NISSAN, 1996

Vehicles per equivalent employee

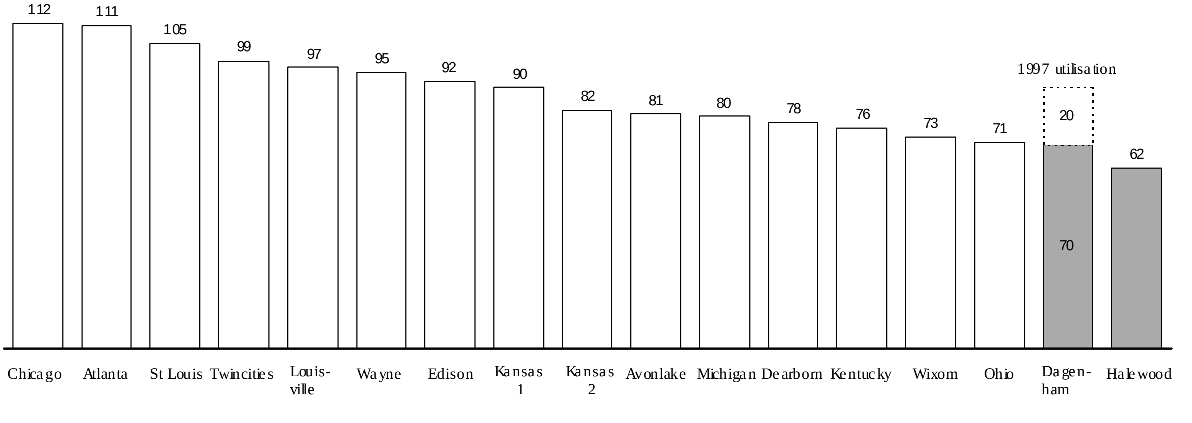


Source: EIU data

Exhibit 20

UTILISATION OF FORD PLANTS IN THE U.S. VS. U.K., 1995

%

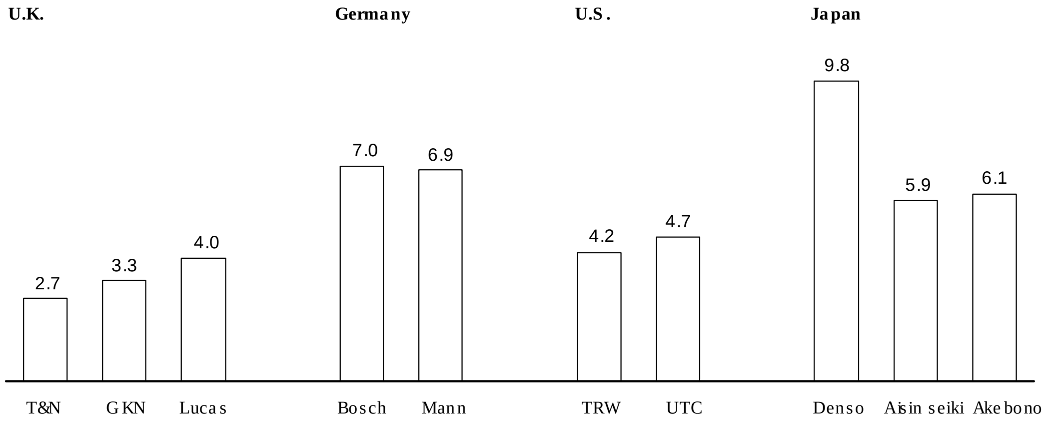


Source: Automotive News

Exhibit 21

R&D SPEND BY U.K. PARTS MANUFACTURERS IN 1996

R&D spend as % sales



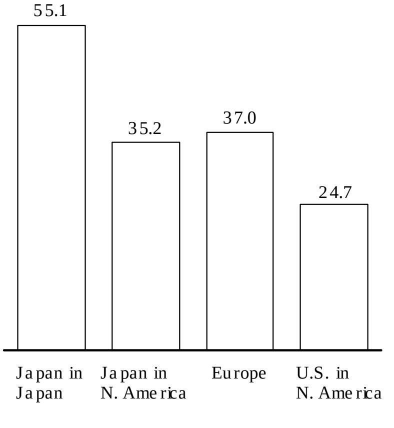
* GKN figure if for 1996

Source: Annual Reports; DTI R&D Scoreboard; Japanese Handbook

Exhibit 22

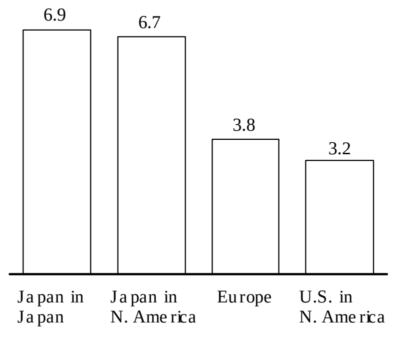
MODEL MIX COMPLEXITY IN AUTOMOTIVE ASSEMBLY PLANT, 1993/94

100 = most complex



USE OF ROBOTS FOR FLEXIBLE AUTOMATION BY REGION, 1993/94

Robots per vehicle per hour

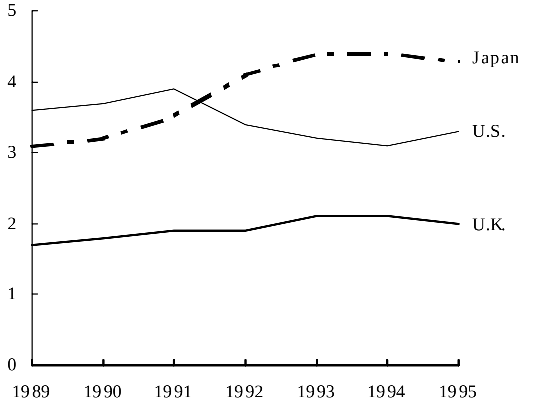


Source: MacDuffie & Pil; IMVP

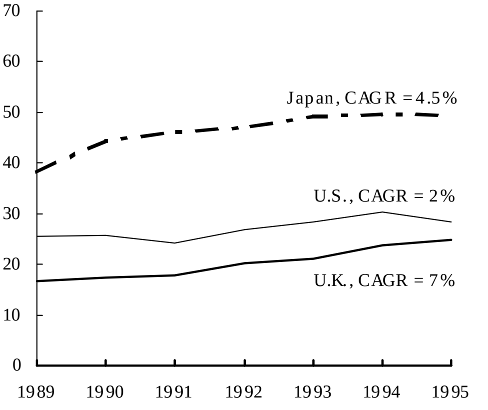
Exhibit 23

CAPITAL INTENSITY, AUTOMOTIVE PARTS, 1989–95

$/hour



TOTAL FACTOR PRODUCTIVITY, AUTOMOTIVE PARTS, 1989–95



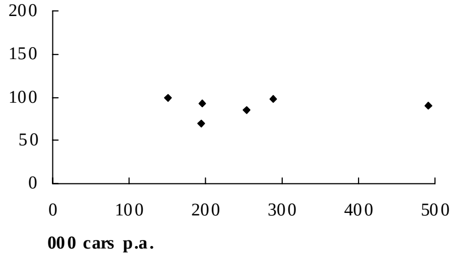
Source: Census of manufacturers

Exhibit 24

IMPACT OF PLANT SIZE ON PRODUCTIVITY, 1996

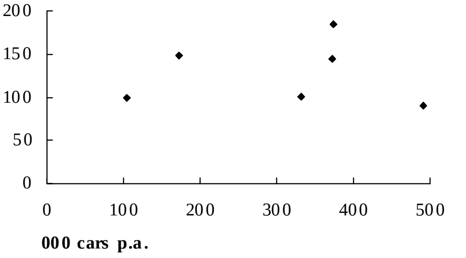
PRODUCTIVITY BY SIZE OF PLANT, FORD

Indexed to smallest = 100



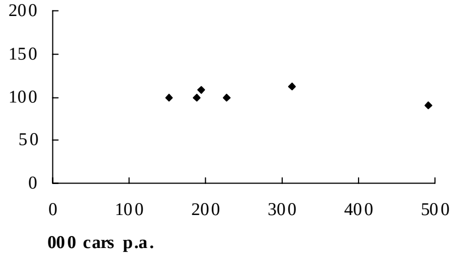
PRODUCTIVITY BY SIZE OF PLANT, HONDA

Indexed to smallest = 100



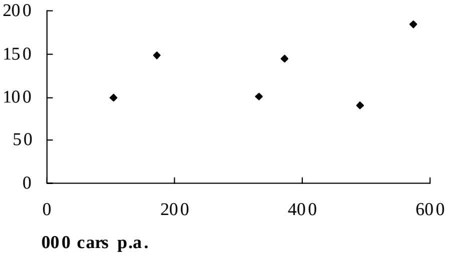
PRODUCTIVITY BY SIZE OF PLANT, GM

Indexed to smallest = 100



PRODUCTIVITY BY SIZE OF PLANT, TOYOTA

Indexed to smallest = 100

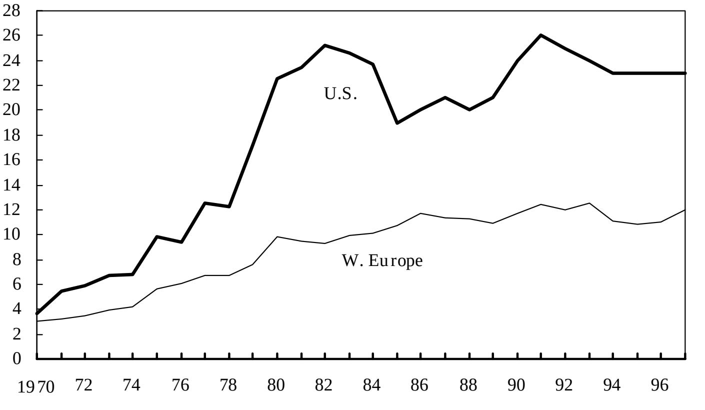


Source: EIU statistics; Harbour report

Exhibit 25

JAPANESE SHARE OF TOTAL U.S. AND WESTERN EUROPEAN VEHICLE SALES MARKET, 1970–97

%

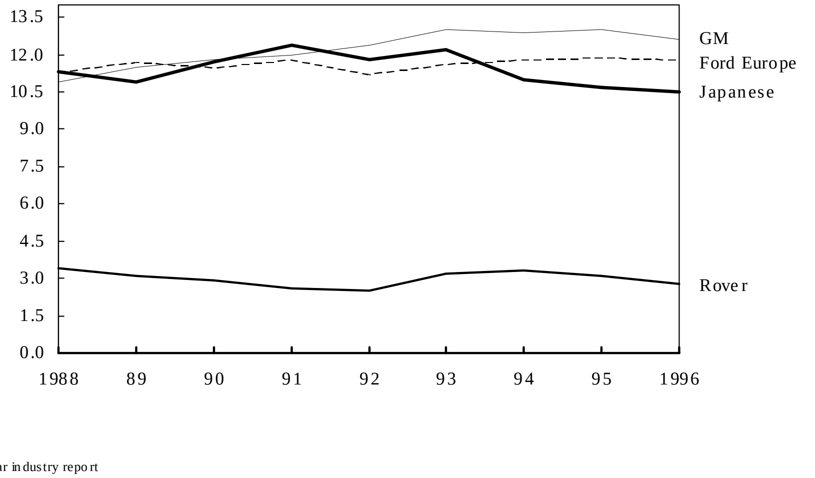


Source: Wards Automotive Data

Exhibit 26

WESTERN EUROPEAN MARKET SHARES FOR PASSENGER CARS 1988–96

%

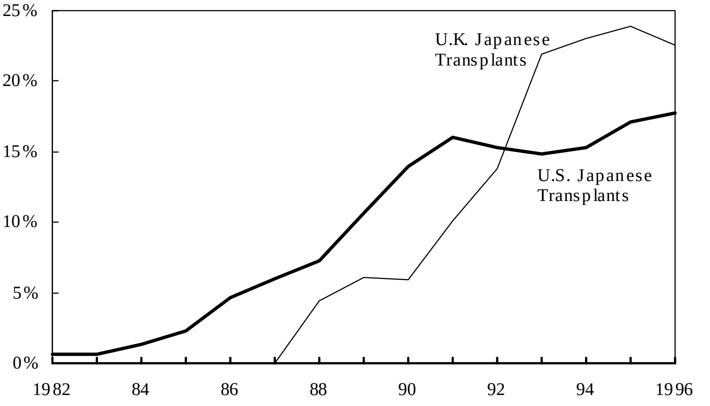


Source: DRI world car industry report

Exhibit 27

U.S. JAPANESE TRANSPLANT PRODUCTION VS. U.K., 1982–96

% total vehicle production

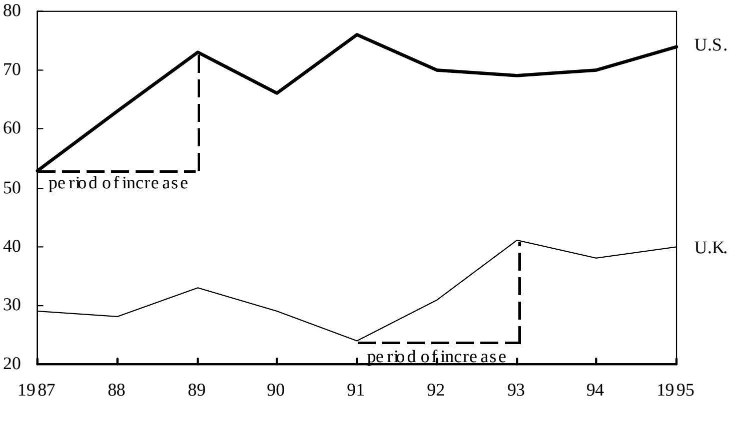


Source: DRI world car industry report; Wards automotive data

Exhibit 28

U.S. LABOUR PRODUCTIVITY FOR AUTOMOTIVE ASSEMBLY VS. U.K., 1987–95

U.S.$/hour worked



* Value added (Converted at 1993 auto-specific PPP) per hour worked

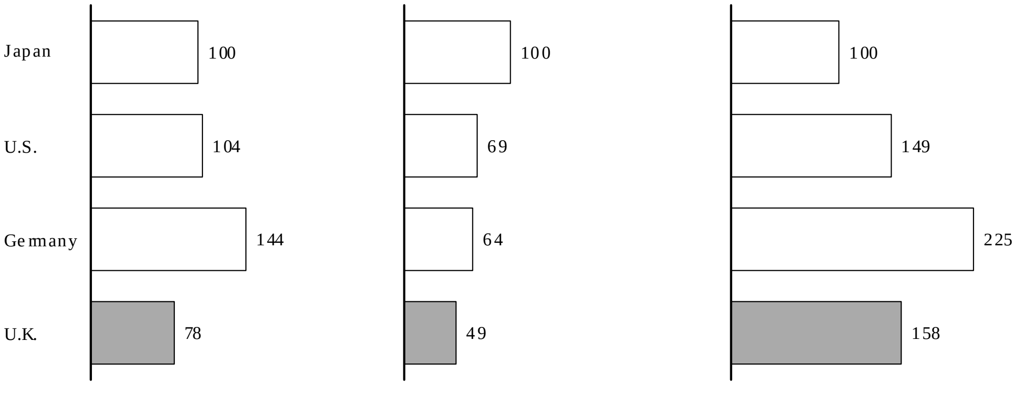
Source: U.K./U.S. census of manufacturers; McKinsey analysis

Exhibit 29

RELATIVE LABOUR COST*, AUTO INDUSTRY, 1995
Indexed to Japan =100

RELATIVE LABOUR PRODUCTIVITY**
Indexed to Japan =100

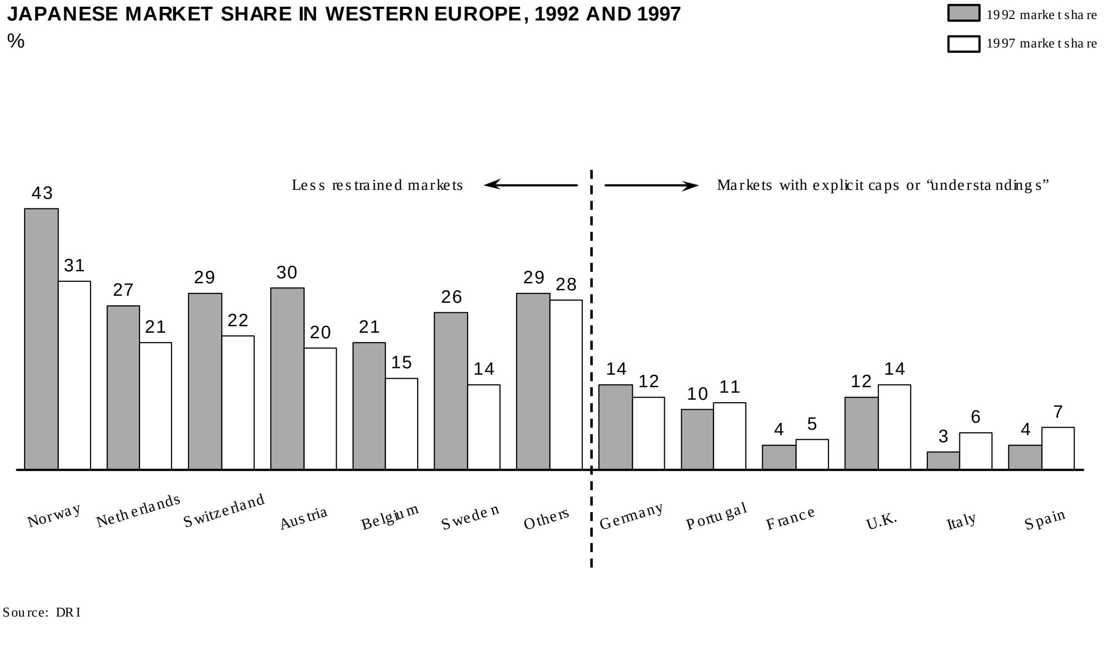
RELATIVE LABOUR COST PER UNIT OUTPUT
Indexed to Japan =100



* Labour cost in DM/hr
** Labour productivity in value added/hr input, average 1993–95
Source: VDA Survey, 1995

Exhibit 30

JAPANESE MARKET SHARE IN WESTERN EUROPE, 1992 AND 1997
%

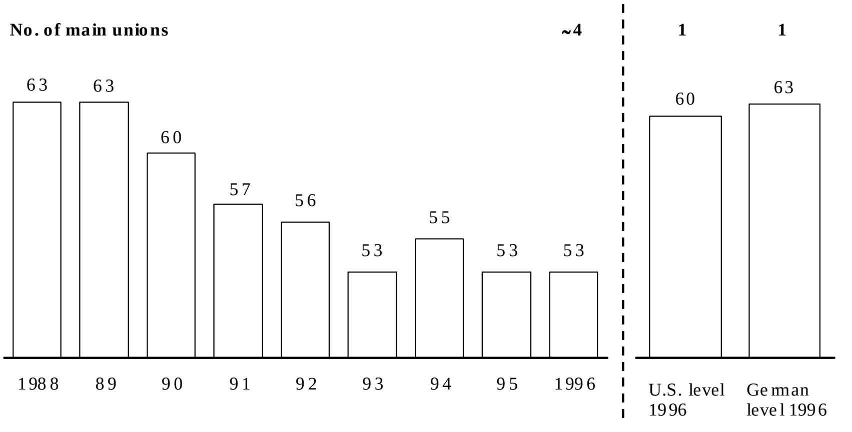


Source: DRI

Exhibit 31

UNION MEMBERSHIP, U.K., 1988–96

% of workforce

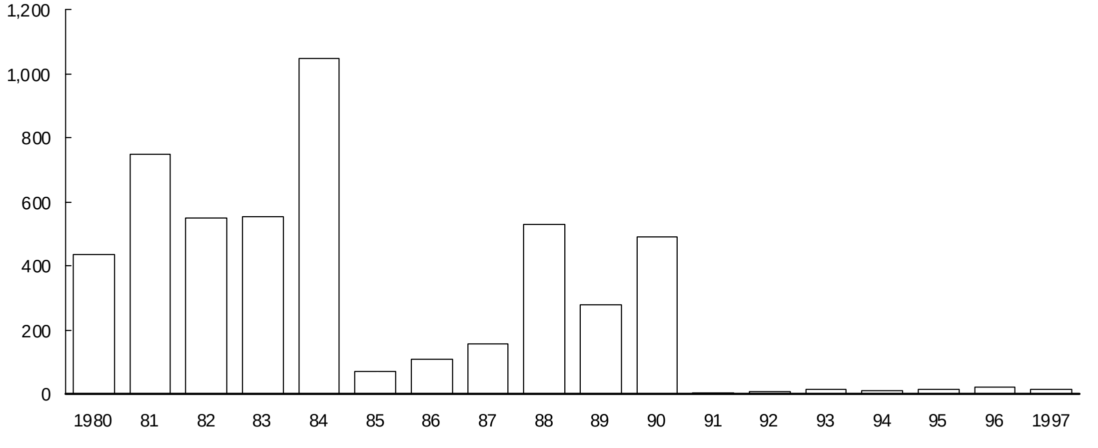


Source: ONS

Exhibit 32

WORKING DAYS LOST TO INDUSTRIAL DISPUTES, 1980–97, FOR U.K. AUTOMOTIVE INDUSTRY

000 days

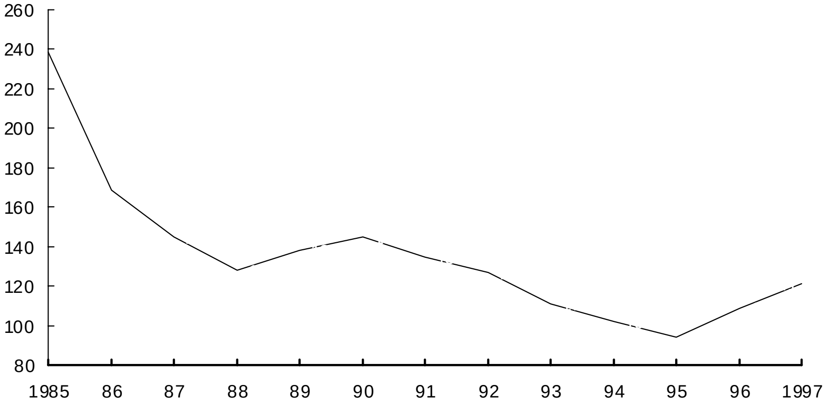


Source: ONS

Exhibit 33

CHANGES IN THE YEN–DOLLAR EXCHANGE RATE

Yen/U.S.$



Note: Average exchange rate for year

Source: International financial statistics; IMF

Exhibit 34

OUTPUT AND EMPLOYMENT FORECAST FOR U.K. AUTOMOTIVE INDUSTRY

	No. of vehicles		Output/capita (£/capita)		Employment (000 people)		Labour productivity non-parts (Japan = 100)		Labour productivity parts (Japan = 100)	
	1995	**2002**	**1995**	**2002**	**1995**	**2002**	**1995**	**2002**	**1995**	**2002**
Base case	1737	2145	162	201	240	220	40	47	45	53
Upside case	1737	2460	162	266	240	197	40	75	45	75
Downside case	1737	1805	162	169	240	175	40	52	45	53

Source: McKinsey analysis

Food processing

EXECUTIVE SUMMARY

This case study benchmarks the performance of the UK food processing sector against that of the US and West Germany. The food processing sector is important because it is the UK's largest manufacturing sector, and because its productivity, and the resulting food prices, affect everyone's standard of living. However, the UK has the lowest labour productivity of the three countries studied, lagging the US by 25 per cent and Germany by 20 per cent. The UK's under-performance is the result of three main factors:

- **Limited strong brands and product proliferation exacerbated by retail demands for product variations:** The UK food processing sector suffers from a limited number of strong brands and product proliferation. Product proliferation, in turn, hampers automation because it implies short run-lengths that make the investment uneconomic. This is exacerbated by powerful retailers demanding excess variations, some of which seem to outweigh consumer benefits of differentiation.

- **Low value added product category mix and a lack of competitive intensity caused by the EU Common Agricultural Policy (CAP):** The UK dairy industry has a relatively low quota of milk under the CAP. Given the UK's greater national preference for fresh milk (which, unlike many other dairy products, tends to be locally produced and consumed), this quota has prevented UK dairy manufacturers from accessing sufficient raw materials to develop more value added products. More widely, the CAP affects approximately 40 per cent of food processing output, and distorts efficient allocation of resources.

- **To a lesser degree, some productivity losses due to UK consumer tastes and market size:** A stronger UK preference for milk, the commodity dairy product, compared to the US or West Germany skews UK production towards a lower value added mix. Also, a smaller population in the UK leads to less scale and lower productivity in the biscuits industry. However, these factors have only a small impact on productivity.

To close the productivity gap, UK processors will need to reduce costs and improve marketing and innovation. In order to incentivise the industry to innovate, Government should strive to reform the CAP so that its social

objectives can be achieved with less market distortion. The Government should also promote competition, paying particular attention to how regulations in one sector (e.g., farming and food retailing) affect other sectors (i.e., food processing).

Food processing

INTRODUCTION

This case study benchmarks the performance of the UK food processing sector against those of the US and West Germany.

Processed food encompasses all foodstuffs except fresh food produce and beverages. The sector comprises several industries such as meat, dairy and bakery (Exhibit 1).

The food processing sector is important because of its size. It accounts for 3 per cent of GDP and 2 per cent of employment, making it the largest manufacturing sector in the UK. Since UK families spend approximately 20 per cent of their income on food, everyone's standard of living is affected by the performance of the sector. Improved productivity in the food processing sector would benefit the whole UK populace through lower prices.

The food processing sector is also interesting because as one of the most regulated in the UK – most notably by the EU Common Agricultural Policy (CAP) – it shows the economic impact of regulations. In addition, the food processing and food retailing cases combine to provide an integrated and intertwined perspective of the food value chain.

In the following sections, we present each country's productivity performance, discuss the causes for differences in performance, and provide recommendations for closing the gaps.

PRODUCTIVITY PERFORMANCE

Overall food processing performance

Labour productivity of the UK food processing sector lags that of the benchmark country, the US, by 26 per cent, and that of West Germany by 21 per cent (Exhibit 2).

Capital productivity lags the US by 6 per cent but leads West Germany by 34 per cent. The UK's total factor (labour and capital) productivity is 19 per cent less than the US' and 3 per cent less than West Germany's (Exhibit 3). Output per capita lags the US by 10 per cent and West Germany by 24 per cent.

Details of the methodology used to arrive at these figures are given in the Appendix.

Food processing sub-sector (industry) performance

Labour productivity for eight UK food processing industries ranges from 64 per cent of US performance in fruit and vegetable processing and production, to 101 per cent in oil and fats manufacture (Exhibit 4). West German figures are similar, albeit slightly higher, when compared to the US.

REASONS FOR DIFFERENCES IN LABOUR PRODUCTIVITY

These differences in sector productivity stem from both differences in the mix of industries (the 'mix effect') and differences in productivity within each industry (the 'level effect').

Although the composition of industries is different across the three countries, the mix effect is surprisingly small (Exhibit 5). The entire UK-US productivity gap and half the UK-West German gap are due to the level effect.

To understand the level effect better, we studied two industries, biscuits and dairy, in detail. We chose biscuits (bakery) and dairy because they are the largest and the third largest industries in UK food processing. Meat, the second largest industry would be unrepresentative because of the special circumstances surrounding BSE ('mad cow disease'). In addition, biscuits (bakery) is one of the lower performing UK industries when compared to the US, whereas dairy is one of the higher performing; hence the synthesis would be balanced and representative.

Below, we discuss the reasons for performance differences in each of the industries and then consolidate the results for food processing overall.

Biscuits

The biscuits industry represents 5 per cent of food processing value added in the UK, and employs some 34,000 people.

The UK biscuits industry's labour productivity lags that of the benchmark country, the US, by 36 per cent and is around the same as West Germany (Exhibit 6).

The UK's capital productivity is the same as that of the US and more than twice that of West Germany. Total factor (labour and capital) productivity is 15 per cent lower than the US but 67 per cent ahead of West Germany (Exhibit 7).

Exhibit 8 shows the framework with which we have analysed the productivity gap across all the sectors studied. It divides the causes for the productivity gap into three groups. At the lowest level, productivity differences are caused by differences in production processes within firms. These differences are driven, however, by factors external to the firm within both the industry sector and the economy at large.

The main reason for the gap between the UK and the US is product proliferation, which in turn has discouraged automation because short run-lengths make the investment uneconomic. Food retailers have exacerbated the product proliferation problem by demanding product variations even on indistinguishable own labels.

Below, we describe the differences in production process that directly explain these productivity gaps, and then discuss the differences in industry dynamics and external factors that cause them.

Production processes

At the production process level, the main causes of low UK labour productivity are product proliferation, significance of own label, less automation, and less importantly, lack of scale:

¶ **Product proliferation:** UK biscuits manufacturers produce 2.6 times as many products (SKUs) as those in the US (Exhibit 9). Since UK manufacturers are not larger than those in the US, this product proliferation increases line downtime, wastes R&D and marketing resources, and leads to lower productivity.

¶ **Less automation:** Product proliferation, in turn, reduces automation in the UK. For example, only 10 per cent of UK packaging lines (where 60 per cent of UK employees work) are fully automated, compared to approximately 35 per cent in the US. Low levels of automation are due to short run-lengths in the UK (caused by product proliferation), which make the investment uneconomic. If UK manufacturers reduced the number of products to US levels, the investment would be justified.

¶ **Significance of own label:** Branded products yield higher margins for food processors than own label products. Only 66 per cent of UK biscuits are branded, compared to 91 per cent in the US (Exhibit 10).

¶ **Scale:** After adjusting for product proliferation, the UK production scale is still a quarter of US levels. However, since most inefficiencies are driven by product proliferation, the residual effect on labour productivity of smaller production scale is small.

Industry dynamics and external factors

Historical product proliferation (and the resulting lack of automation) has persisted despite company consolidation and is exacerbated by the UK food retailers' demands for product variation. The crowded marketplace may constrain the potential to build dominant brands, and limit the ability to successfully launch new products. Lack of scale is due to the UK manufacturers' smaller market size, but this has only a small effect:

¶ **Industry consolidation has not significantly reduced product proliferation:** The numerous SKUs in the biscuit industry are largely a consequence of history. The industry originally embraced many small companies each with its own set of brands. However, despite industry consolidation, many of these brands have survived. Manufacturers have been reluctant to cull brands significantly for fear of ceding market share to competitors. Without a significant increase in competitive intensity this situation is likely to continue.

¶ **Retailers have exacerbated product proliferation:** UK retailers are more concentrated and thus more powerful than those in the US, and have harmed biscuits manufacturers' operational productivity by demanding product variations even on basic own labels. We estimate that retailers account for approximately half of the product proliferation (while accounting for 34 per cent of sales, own labels constitute half the SKUs). In the short run, food retailers are rational in increasing their own label ranges since they make more profit from own label than from branded products (Exhibit 11). However, the extremely low sales volume of some products suggests that the productivity and resulting cost penalties of some variations may outweigh the consumer benefits of differentiation.

¶ **Small size of the UK market reduces run-lengths:** More UK output per capita (from higher consumption and exports) compared to the US is not enough to offset the impact of a smaller population in determining line lengths.

Dairy

The dairy category comprises fluid milk, cheese, butter, condensed milk, milk powder and other milk-derived products such as yoghurt. The UK dairy industry represents around 10 per cent of the total food processing sector by value added, and employs some 37,000 people.

The UK's labour productivity lags the benchmark country's, the US, by 16 per cent and West Germany's by 36 per cent (Exhibit 12). Total factor productivity is 18 per cent and 24 per cent behind those of the US and West Germany respectively (Exhibit 13).

Exhibit 14 shows the causality framework for analysing the productivity gap. There are four reasons for this gap. First, the UK's CAP quota limits its supply of milk for high value added usage and leaves the UK with an unproductive product category mix. Second, regional oligopolies in doorstep delivery of milk shield UK firms from competitive pressures and stifle innovation. Third, UK firms lack marketing skills and suffer from product proliferation – a problem, as in biscuits, exacerbated by retail demands for variety. Finally, historic price subsidies by the UK Government (abolished in 1994) protected inefficient producers and delayed rationalisation.

Below, we again describe differences in production process and then link them to differences in industry dynamics and external factors.

Production processes

The UK suffers from an unproductive product mix, as well as a lack of high value added products in each product category. Product proliferation harms line utilisation and also hampers productivity. In addition, low capital intensity compared to West Germany (but not the US) explains most of the gap with West Germany:

¶ **Product category mix:** 60 per cent of UK dairy output is fluid milk, as opposed to 47 per cent in the US and 28 per cent in West Germany. As a commodity, fluid milk has the lowest labour productivity among dairy categories; the UK therefore suffers from an unproductive product mix (Exhibit 15).

¶ **Value added within category mix:** UK productivity also suffers from a lower share of higher value added products. For example, the UK produces the least amount of processed and cream cheese – high value added cheese categories that require technical expertise (Exhibit 16). There are also fewer branded dairy products and more own labels in the UK compared to the US. For example, the share of own label yoghurt in the UK is 44 per cent compared to 15 per cent in the US.

¶ **Product proliferation:** UK dairy companies manufacture more products than either US or West German companies. Product proliferation, as in the biscuits industry, harms line utilisation and lowers productivity. As one industry expert commented, "In the US and Germany, companies decide to focus on branded goods or own label. Whichever the choice, they can specialise. In the UK, most firms try to produce both, and as a result line utilisation rates plummet."

- **Capital intensity:** By substituting capital for labour through automation, West Germany has boosted labour productivity. West German capital intensity is almost two thirds higher than that of the UK. Capital intensity is the same in the UK as the US, and thus is not an explanatory factor for the UK-US productivity gap.

Industry dynamics and external factors

The CAP quota harms the UK's product mix by limiting the amount of milk that can be used for higher value added usage. In addition, UK preference for doorstep delivery favours regional oligopolistic practices and stifles product innovation. Product proliferation, as in biscuits, is exacerbated by the demands of retailers for product variation. In addition, historic government subsidies to inefficient producers delayed rationalisation in the UK. Higher wages explain a higher degree of automation in Germany compared to the UK and the US:

- **The CAP quota system has harmed the UK product mix:** The UK's CAP quota on dairy production is 40 per cent lower than Germany's[1], while milk consumption is 70 per cent higher than in Germany and 20 per cent higher than in the US (Exhibit 17). Since fluid milk tends to be domestically produced and consumed, higher fluid milk production within lower overall production volume skews the UK product mix.

- **Doorstep delivery has shielded unproductive producers:** 44 per cent of fluid milk in the UK is delivered to the doorstep, compared to 1 per cent in the US and none in West Germany (Exhibit 18). Because of the relatively high fixed costs involved, doorstep delivery is conducive to the establishment of local oligopolies, especially in areas without large scale retailers. A lack of price transparency (resulting from many operators not itemising their billing) provides further room for price increases. High margins on doorstep delivery have shielded unproductive dairy producers from a need to rationalise (Exhibit 19).

- **The UK Milk Marketing Board used to protect inefficient producers:** By subsidising bulk (i.e., cheese, butter etc.) producers with cheap raw materials, the statutory Milk Marketing Board (abolished in November 1994) reduced competitive intensity in the UK and skewed the UK product mix towards an even lower value added mix (Exhibit 20).

- **UK retailers have demanded product variations:** UK food retailers are more consolidated, and thus more powerful in their relationships with dairy producers, compared to those in the US or West Germany (Exhibit

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1 The quota was introduced in the EU in 1984. Each country's quota allotment corresponded to its production volume at the time.

21). As in the biscuits industry, the demand for product differentiation has exacerbated the proliferation of UK products.

¶ **High wages in Germany have led to automation:** Finally, the high cost of labour in West Germany has driven German firms to substitute capital for labour (Exhibit 22).

Overall food processing: synthesis of the biscuits and dairy cases

In synthesising the results of the biscuits and dairy cases in terms of both production process and industry dynamics and external factors, we focused primarily on the gap between UK and the benchmark country, the US. Exhibit 23 shows the causality framework for analysing the gap.

Production processes

The causes of UK's under-performance – unfavourable product category mix, lower value added within category mix, higher levels of product proliferation, and the resulting low levels of automation – all indicate a historic relative lack of marketing skills among food processors in the UK. US food processors have created fewer but stronger brands that sell more.

Industry dynamics and external factors

UK food processors suffer from lack of exposure to global best practices and low domestic competitive intensity. For example, regional oligopolies (for example, doorstep delivery in dairy), government subsidies (as provided by the Milk Marketing Board) and the CAP regime (both the dairy quota and more widely as it applies to 40 per cent of UK food output) all obstruct competition and hamper marketing and innovation.

The impact of food retailers on the food processing industry is a moot point. Although UK retailers are more powerful than those in the US, their role in the decline of UK brands can be over-stated. In many cases, retailers are replacing brands with own labels when food processors' marketing activities have been relatively weak. Where brands are well marketed and innovation is abundant – as in the cereals industry – brands still occupy a large share, albeit slightly less than in the US (Exhibit 24).

Finally, national tastes do have some effect on productivity – for example, the UK's high consumption of milk and limited foreign demand for UK biscuits.

FUTURE OUTLOOK AND RECOMMENDATIONS

Future outlook

Current trends in liberalisation and globalisation are expected to alter the food processing landscape to intensify levels of competition.

¶ **Liberalisation** is progressing on multiple levels. Provisions of the Uruguay Round GATT Agreement require the EU gradually to deregulate its food sector and withdraw subsidies. Rationalisation is therefore expected to accelerate across the Union, the UK being no exception. Within the UK, government protections and subsidies are disappearing. Non-regulatory local conditions that limited competition are also decreasing; for example, supermarkets are already starting to replace doorstep delivery as the predominant channel for milk distribution (Exhibit 25). All of these changes will increase competitive intensity.

¶ **Globalisation** is increasing the pace of innovation transfers across borders. The food processing industry has traditionally been local and fragmented despite the existence of some large multinationals such as Nestle, Unilever, Danone, Philip Morris and Coca Cola. Top thirty global multinationals still have less than 30 per cent of West European food processing market. However, what used to be national competition is more and more regional, and sometimes global. New products by foreign multinationals are launched in the UK immediately, and in the case of dairy, dominate the fastest growing segments (Exhibit 26). The successful firms of tomorrow will be those that balance the benefits of international standardisation with the need for local customisation.

Industry recommendations

For the food processing industry there will therefore be an increasing need to reduce costs and improve marketing:

¶ **Reducing costs** will, for example, require companies to further consider their strategies towards line specialisation and product mix in terms of branded products and generic own labels, and to start to adopt lean manufacturing techniques that reduce changeover times and eliminate waste. In addition, although UK producers are consolidating, even the largest UK food processing plants are still much smaller than those in the US (Exhibit 27). Smaller firms may need to consolidate, especially as fixed costs of R&D and marketing become more important.

¶ **Improved marketing** such as innovative new product development and more effective branding will result in enhanced value added. There are more new product introductions per capita in the UK than in the US.

However, most are line extensions of existing brands rather than new brands (Exhibit 28). Stronger emphasis needs to be placed on the quality, rather than quantity, of new products. In addition, product proliferation dilutes the advertising expenditure available for each product. As in the cereals industry, firms need to focus on fewer core products and brand them more heavily.

Government recommendations

The UK Government should strive to reform the CAP so that its social objectives are met with less market distortion. The Government should also promote competition, paying particular attention to how regulations in one sector affect other sectors:

¶ **CAP reform** is necessary for the UK food sector to become competitive, and for consumers to enjoy lower prices. This would also reduce the burden of tax-payers who currently subsidise unproductive producers. If the goal of CAP is to preserve the welfare of farmers and food processors in the EU, fiscal subsidies would distort the market less. While pursuing this long term reform, the UK Government should amend any short term inequalities in the current CAP regime. For example, the dairy quota system that undermines UK's competitiveness in dairy farming should be revised.

¶ **Promotion of competition** is one of the Government's main levers to encourage firms to be more productive. In doing this, particular attention must be paid to unintended cross-sectoral effects of regulation. For example, subsidies to farmers reduce the need for agricultural productivity improvements and so harm food processors by raising raw material costs and hence the final price for their goods. Land use regulations that restrict format innovation among food retailers harm the food processing industry in the long run by reducing retail pressures to improve. Comprehensive measures – within and across sectors – are needed to foster competition.

Appendix: Methodology for productivity calculations

To compare the performance of the UK food processing sector with that of other countries we investigated output, labour and capital inputs and labour and capital productivity.

¶ **Output:** Net value added definition of output (shipment value - cost of all goods and services + cost of services) was adopted across all countries. To be consistent with German data, only data for establishments with over twenty employees were used. For the exchange rates, OECD PPPs were adjusted to take out the effects of different retail margins and raw material prices in each country.

¶ **Labour inputs:** Number of hours worked in the industry (FTEs x average number of hours worked) was calculated across countries. Again, only data for establishments with over twenty employees were used.

¶ **Capital inputs:** Capital expenditures of 31 years for structures and 17 years for equipment were built up to estimate capital stock figures for each country. Sudden death depreciation method was applied. We have not accounted for obsolescent assets. Only data for establishments with over twenty employees were used. OECD PPPs for gross fixed capital expenditures were used as exchange rates.

¶ **Labour productivity:** Output divided by labour inputs.

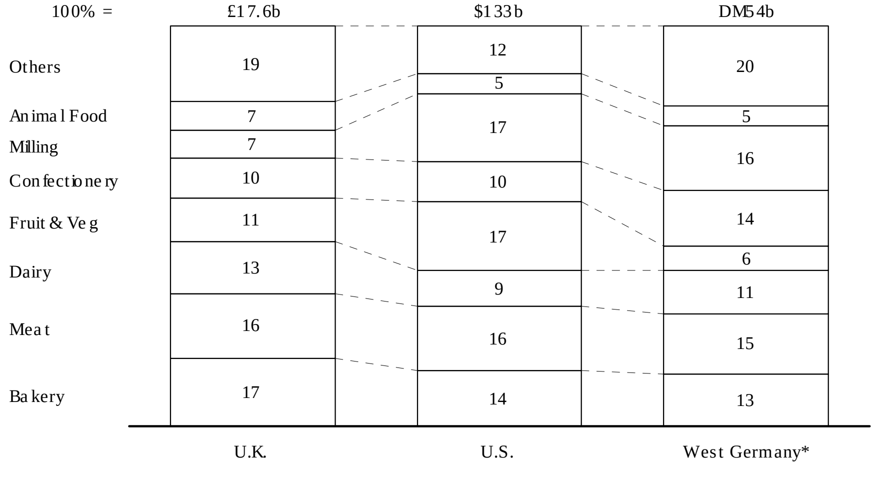
¶ **Capital productivity:** Output divided by capital inputs.

¶ **Total factor productivity:** Labour and capital productivities were combined using a Cobb-Douglas function with value added shares of labour and capital of 60 per cent and 40 per cent respectively.

Exhibit 1

FOOD PROCESSING SECTOR BREAKDOWN, BY VALUE ADDED, 1994

%



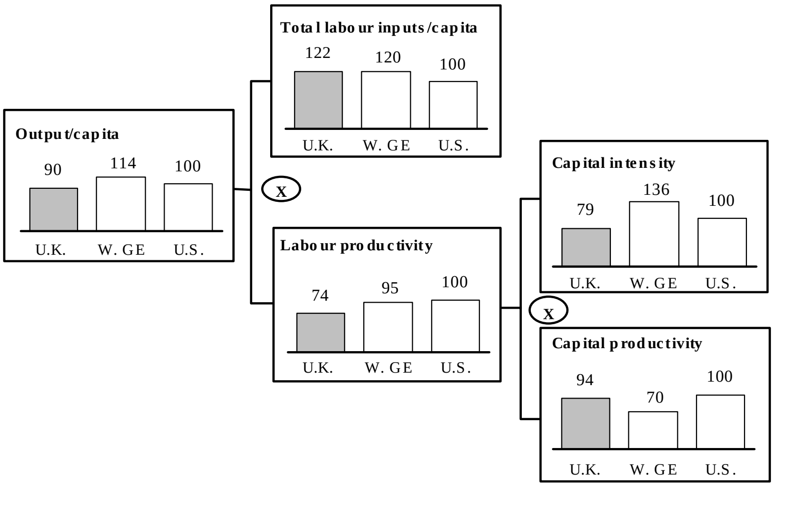
* Establishments with over 20 employees

Source: National accounts

Exhibit 2

FOOD PROCESSING OUTPUT, PRODUCTIVITY AND INPUTS, 1994

Indexed to U.S. = 100

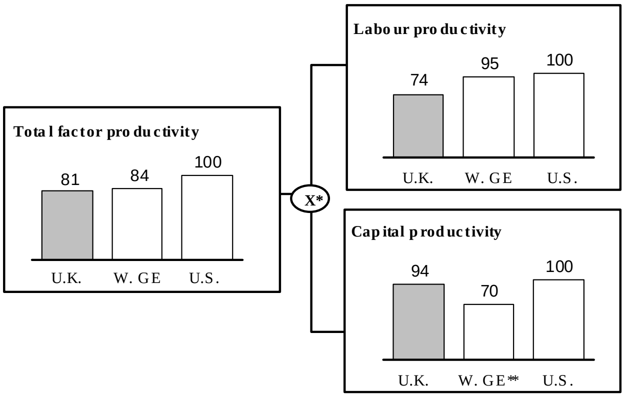


Source: Census of Manufacturers; Census of Production; Labour Force Survey; McKinsey analysis

Exhibit 3

FOOD PROCESSING TOTAL FACTOR PRODUCTIVITY, 1994

Indexed to U.S. = 100



* International average alpha (= labour portion of total factor) of 60% was applied to all countries

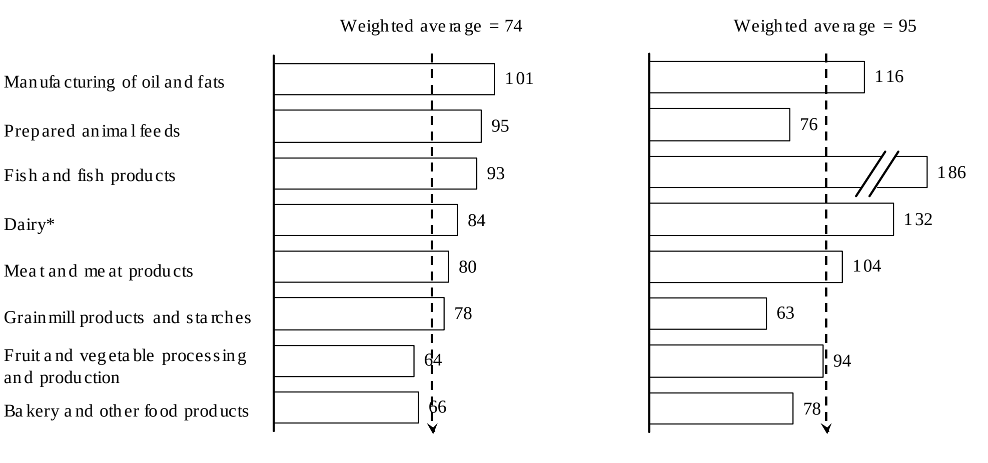
** W. German figure is for 1992

Source: U.S. Census of Manufacturers; U.K. Census of Production; German national accounts; McKinsey analysis

Exhibit 4

LABOUR PRODUCTIVITY BY SUB-SECTOR

1994; Indexed to U.S. = 100



* Excludes ice-cream

Exhibit 5

SUB-SECTOR MIX IMPACT, 1994

Indexed to U.S. = 100

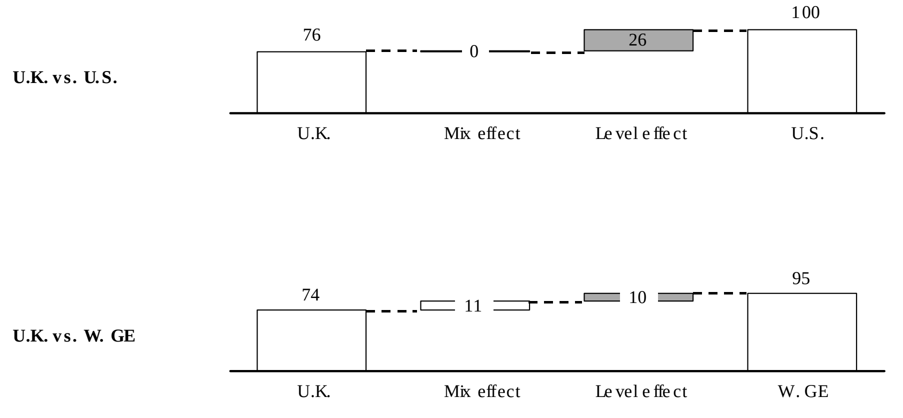
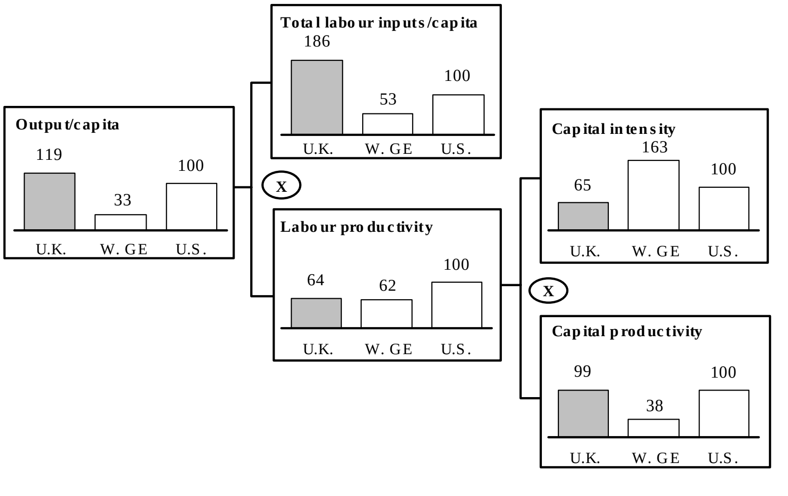


Exhibit 6

BISCUITS OUTPUT, PRODUCTIVITY AND INPUTS, 1994

Indexed to U.S. = 100

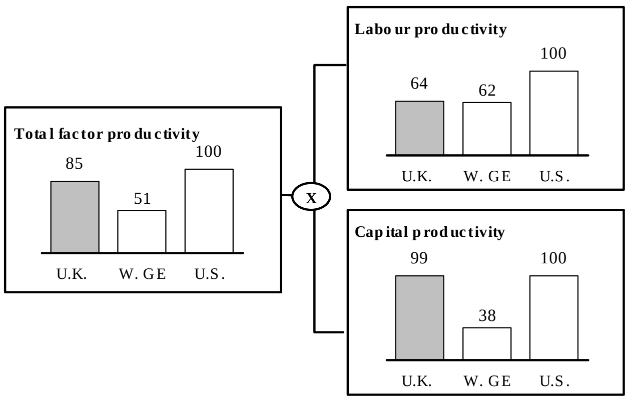


Source: Census of Manufacturers; Census of Production; Labour Force Survey; McKinsey analysis

Exhibit 7

BISCUITS TOTAL FACTOR PRODUCTIVITY, 1994

Indexed to U.S. = 100



Source: U.S. Census of Manufacturers; U.K. Census of Production; German national accounts; McKinsey analysis

Exhibit 8

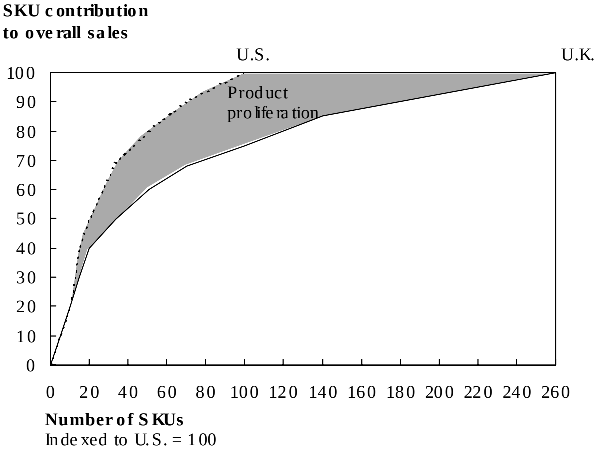
CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

		Biscuits U.K. v. U.S.
External factors	• Fiscal and macroeconomic environments	-
	• Product market	
	– Trade/FDI barriers	-
	– Product regulations	-
	• Labour market	
	– Labour rules/unionism	-
	– Relative labour cost	-
	– Education	-
	• Capital market	
	– Corporate governance/government ownership	-
	– Access to capital	-
	• Other external factors	
	– Other industries /up and down stream	●
	– Country specific factors	○
Industry dynamics	• Competition with best practice	-
	• Domestic competitive intensity	●
Production process	• Mix of products and services/marketing	
	– Product category mix	-
	– Value added within category mix	○
	– Product proliferation	●
	– Pricing structure/marketing	-
	• Production factors	
	– Capital intensity/technology	●
	– Scale	○
	– Front line skills/trainability	-
	– Matching capacity to demand	-
	• Operations	
	– Organisation of functions and tasks	-
	– Design for manufacturing	-
	– Suppliers and supplier relationships	-
	Productivity performance (comparison country = 100)	64

Exhibit 9

PRODUCT PROLIFERATION OF U.K. MANUFACTURERS



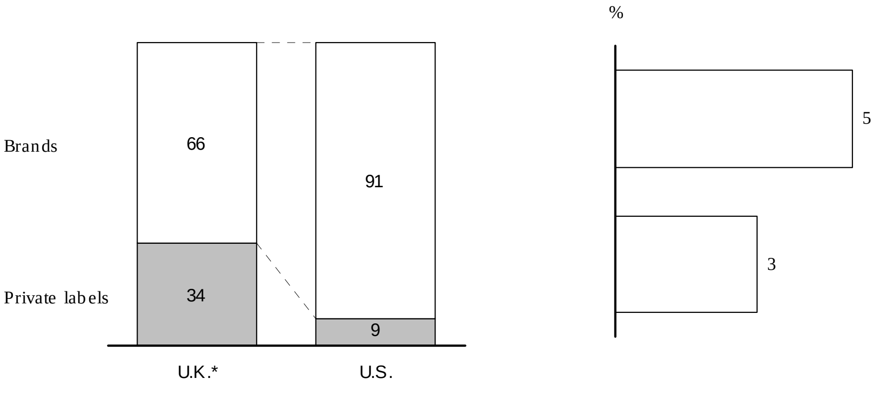
* 80% of products by leading producers covered

Source: IRI; Taylor Nelson; McKinsey analysis

Exhibit 10

SHARE OF PRIVATE LABELS

1992–96 average; % of sales



* Sweet biscuits only (95% of market)

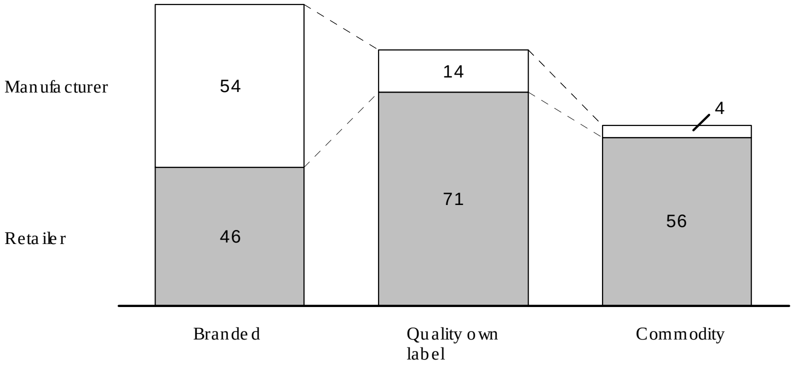
Source: AC Nielsen Homescan/Mintel; Profound

Exhibit 11

DISTRIBUTION OF VALUE FROM SALES OF BRANDS VS. OWN-BRANDS*

ESTIMATES

Indexed to major brand margin = 100



* Value shares are for the bakery category as a whole; price differentials are for U.K. biscuits

Source: McKinsey consumer goods practice; interviews

Exhibit 12

DAIRY OUTPUT, PRODUCTIVITY AND INPUTS, 1992–94

Indexed to U.S. = 100

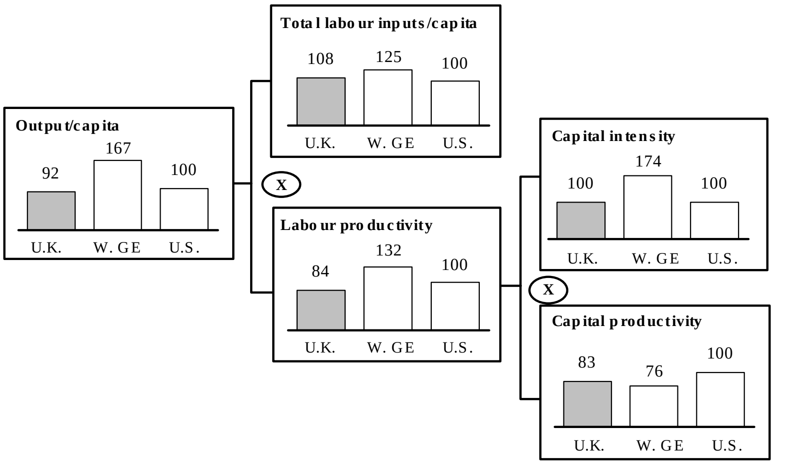


Exhibit 13

DAIRY TOTAL FACTOR PRODUCTIVITY, 1992–94 AVERAGE

Indexed to U.S. = 100

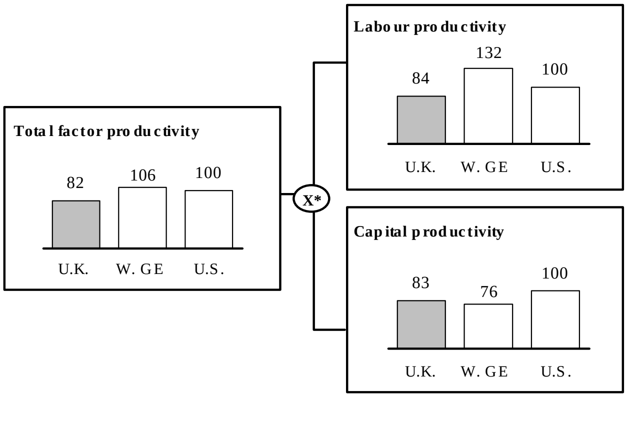


Exhibit 14

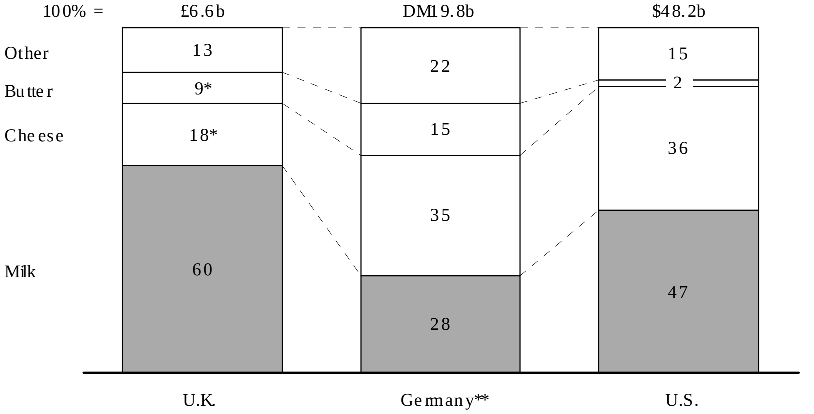
CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

		Dairy U.K. vs. U.S.
External factors	• Fiscal and macroeconomic environments	-
	• Product market	
	– Trade/FDI barriers	-
	– Product regulations	○
	• Labour market	
	– Labour rules/unionism	-
	– Relative labour cost	-
	– Education	-
	• Capital market	
	– Corporate governance/government ownership	○
	– Access to capital	-
	• Other external factors	
	– Other industries /up and down stream	○
	– Country specific factors	○
Industry dynamics	• Competition with best practice	●
	• Domestic competitive intensity	○
Production process	• Mix of products and services/marketing	
	– Product category mix	●
	– Value added within category mix	○
	– Product proliferation	○
	– Pricing structure/marketing	-
	• Production factors	
	– Capital intensity/technology	-
	– Scale	-
	– Front line skills/trainability	-
	– Matching capacity to demand	-
	• Operations	
	– Organisation of functions and tasks	-
	– Design for manufacturing	-
	– Suppliers and supplier relationships	-
	Productivity performance (comparison country = 100)	84

Exhibit 15

DAIRY PRODUCT MIX: 1994 SHIPMENT VALUE



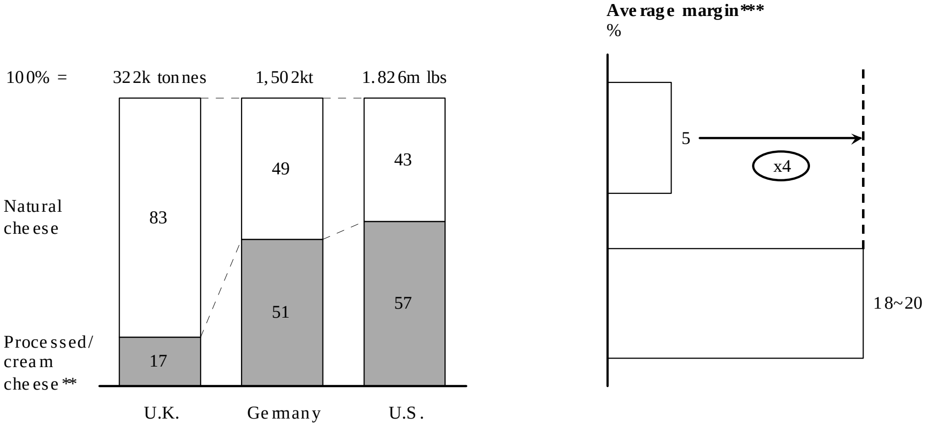
* Butter and cheese shipment figure not available. Split by tonnage: butter = 156,000t (32%); cheese = 333,000t (68%)
** German figures for all of Germany (other analyses for W. Germany only)

Source: Census of manufacturers; OECD; Dairy Industry Newsletter; National Dairy Council; McKinsey analysis

Exhibit 16

HIGH VALUE ADDED PRODUCTS: CHEESE*

%



* U.K. (1993), All of Germany (1994), U.S. (1995)

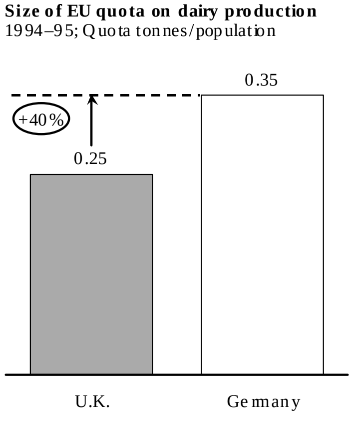
** For the U.K. sum of soft cheese, cream cheese, and all other cheese excluding 9 largest categories of natural cheese (e.g., Cheddar, Stilton). For Germany, sum of processed and fresh cheese. For U.S., sum of processed, shredded and grated cheese sold in supermarkets (excluding supermarket service delicatessens)

*** U.S. estimate

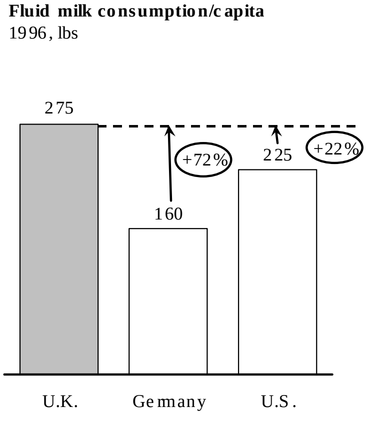
Source: Dairy Facts and Figures; Nielsen Marketing Research; SB; BML; EIU; McKinsey analysis

Exhibit 17

QUOTA INCREASING SHARE OF FLUID IN MILK



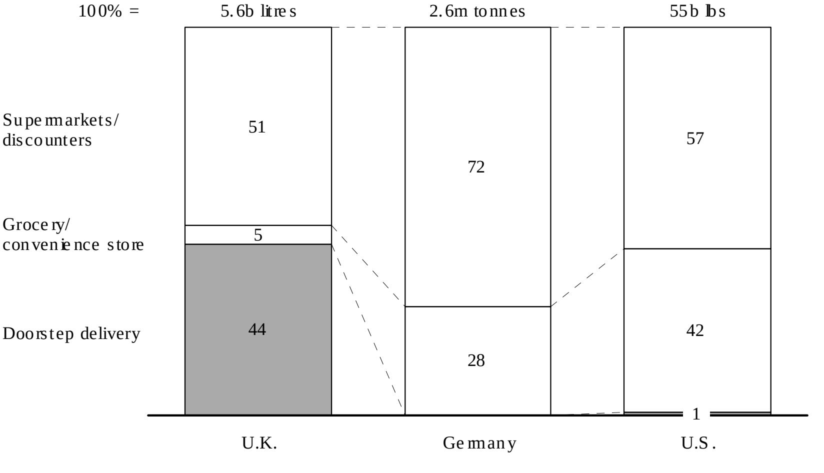
Source: EU Dairy Facts and Figures 1994, p46



Source: USDA; National Drinks Survey, Taylor Nelson AGB

Exhibit 18

DISTRIBUTION CHANNELS FOR FLUID MILK, 1995

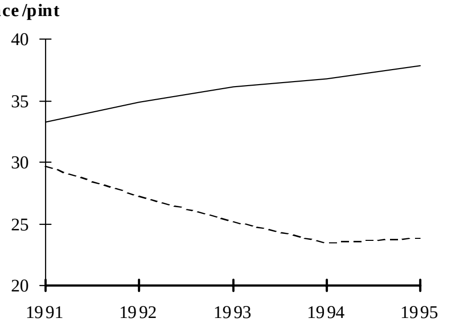


Source: USDA; EIU

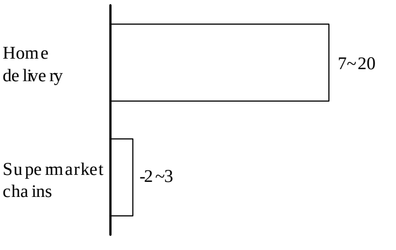
Exhibit 19

HOME DELIVERY VS. RETAIL SALES

Average milk prices in the U.K.*



U.K. margin by channel (full-cost allocated)
%

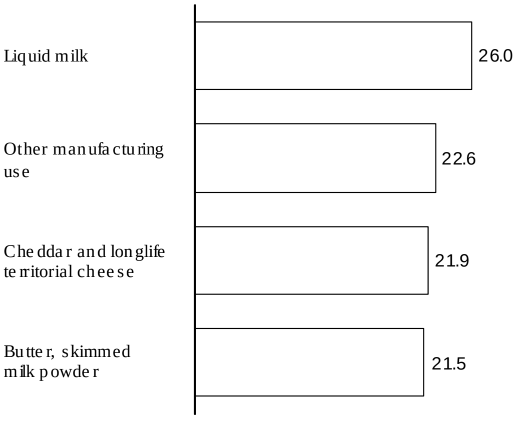


* England and Wales
Source: NDC; McKinsey analysis

Exhibit 20

END-USE PRICING OF MILK MARKETING BOARD*

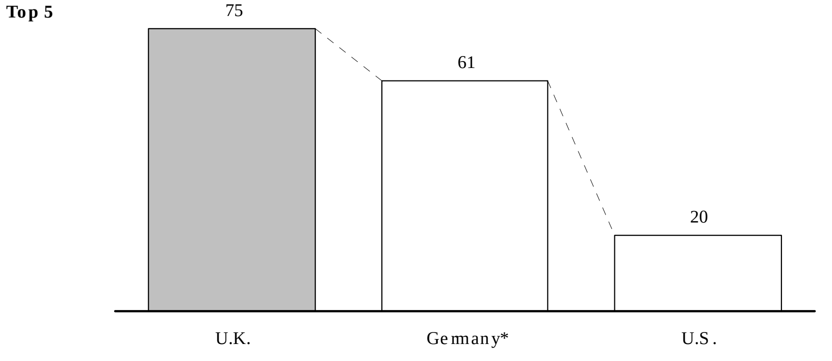
October 1994; pence/litre



* Abolished in November 1994
Source: House of Commons Agricultural Committee (U.K.)

Exhibit 21

SHARE OF TOP 5 SUPERMARKETS: CHEESE



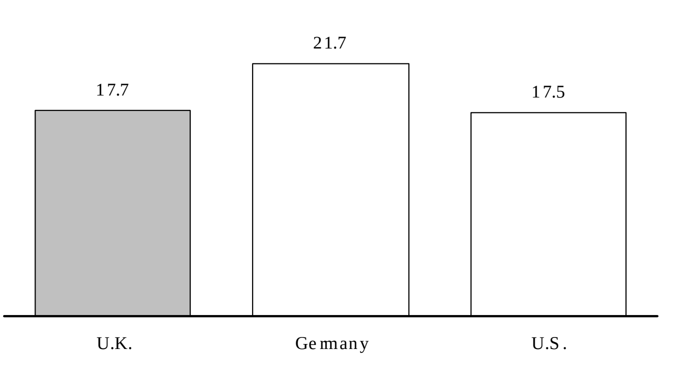
Note: U.K. (1995), Germany (1997), U.S. (1996)
* Estimate for total dairy sector

Source: National Cheese Institute; USDA, Dairy Management, Inc.; Rundschau; AGB; McKinsey analysis

Exhibit 22

COMPARATIVE LABOUR COSTS

1997; U.S.$/hr worked*



* For the whole economy. Includes all cash earnings and employers' costs for social security and other mandatory and voluntary non-cash benefits, including pensions, healthcare, and life and disability insurance cover. Converted at market exchange rate in April 1997

Source: The Guide to Employee Benefits and Labour Law in Europe 1997/1998 with Japan and the U.S.

Exhibit 23

CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

		Biscuits	Dairy	Food processing
External factors	• Fiscal and macroeconomic environments	-	-	-
	• Product market			
	– Trade/FDI barriers	-	-	-
	– Product regulations	-	○	○
	• Labour market			
	– Labour rules/unionism	-	-	-
	– Relative labour cost	-	-	-
	– Education	-	-	-
	• Capital market			
	– Corporate governance/government ownership	-	○	-
	– Access to capital	-	-	-
	• Other external factors			
	– Other industries /up and down stream	●	○	●
	– Country specific factors	○	○	○
Industry dynamics	• Competition with best practice	-	●	○
	• Domestic competitive intensity	●	○	●
Production process	• Mix of products and services/marketing			
	– Product category mix	-	●	○
	– Value added within category mix	○	○	○
	– Product proliferation	●	○	○
	– Price structure/marketing	-	-	-
	• Production factors			
	– Capital intensity/technology	●	-	○
	– Scale	○	-	-
	– Front line skills/trainability	-	-	-
	– Matching capacity to demand	-	-	-
	• Operations			
	– Organisation of functions and tasks	-	-	-
	– Design for manufacturing	-	-	-
	– Suppliers and supplier relationships	-	-	-
	Productivity performance (comparison country = 100)	64	84	74

Exhibit 24

SHARE OF PRIVATE LABELS

% of sales, 1996

	U.K.	U.S.	U.K./U.S. ratio
Coffee	53	8	x6.6
Tea	31	8	x3.9
Biscuits	34	9	x3.8
Pasta	56	16	x3.5
Flour	49	14	x3.5
Edible oils	64	21	x3.0
Jam	56	26	x2.2
Cereals	22	15	x1.5

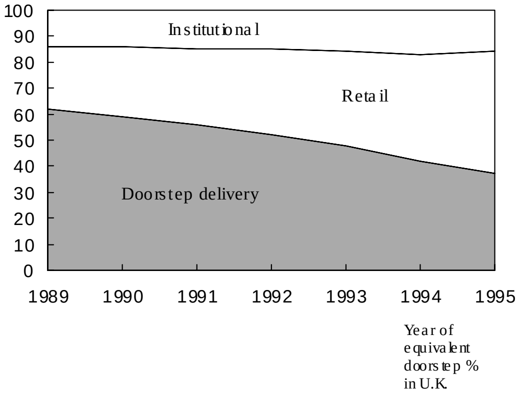
Source: AC Nielsen Homescan/Minitel; Profound; Private-Label Manufacturers Association

Exhibit 25

DECLINE IN DOORSTEP DELIVERY OF MILK

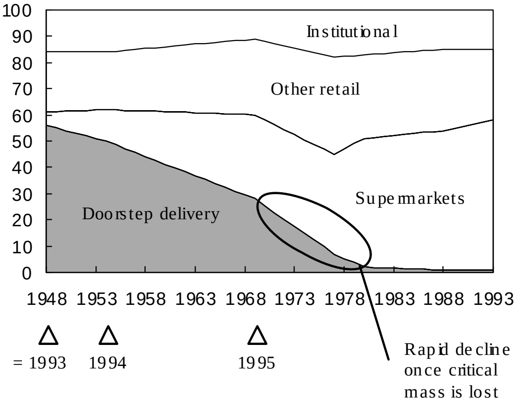
U.K.

Composition
%



U.S.

Composition
%

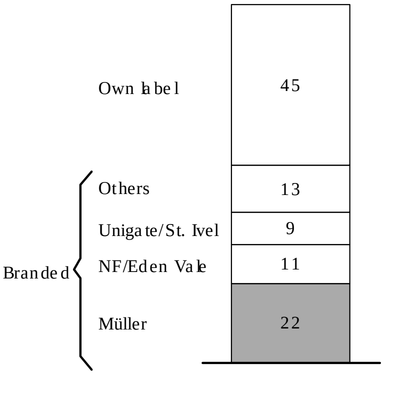


Source: Manchester, 1983 and updates; MMD Ltd.

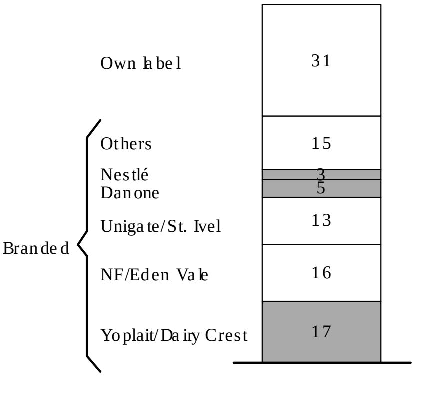
Exhibit 26

SUCCESS OF FOREIGN MULTINATIONALS

Yoghurt market share: U.K.
1995; %



Fromage frais market share: U.K.
1995; %

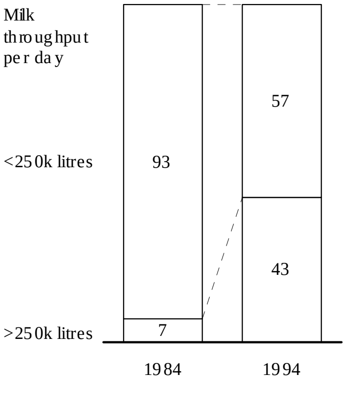


Source: Leading National Advertisers, Inc.; Register-MEAL; Dairy Industry Newsletter

Exhibit 27

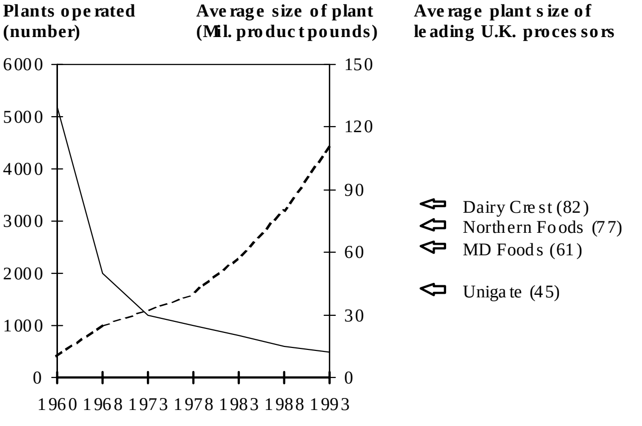
CONSOLIDATION OF U.K. MILK PROCESSORS

Production by plant scale
%



Source: Dairy Industry Federation

Size of U.S. firms



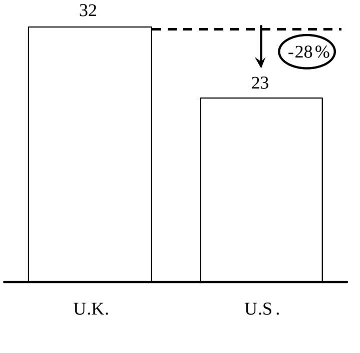
* Converted at 1kg/litre of milk

Source: Manchester; 1985 and updates; Dairy Industry Newsletter

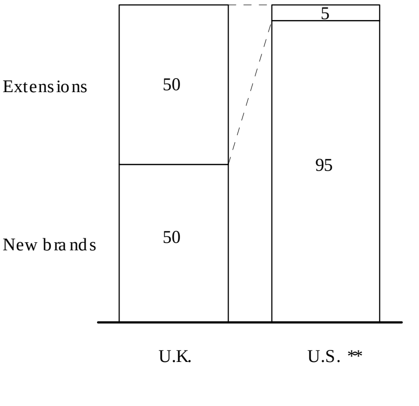
Exhibit 28

PRODUCT INNOVATION IN BISCUITS

New product introductions
Per $m sales, 1990–95



New brands vs. brand extensions
1997*



* 'New brands' includes distinctive new products in own-brand ranges, 'brand extensions' includes repackaging and relaunching as well as adding to range within a brand
** Crackers only

Source: IRI, Leatherhead; McKinsey analysis

Food Retailing

EXECUTIVE SUMMARY

This case study benchmarks the productivity of the UK food retailing industry against the US and France. The food retail industry is critical to the UK economy because it is a large employer, especially of lower-skilled workers. The industry is also becoming increasingly interconnected with other sectors of the economy, so its productivity performance can have significant effects on other parts of the economy.

Driven by space productivity that is about 50 per cent higher than both the US and France, the UK has achieved "best-in-class" total factor productivity. However, the UK has the lowest labour productivity of the three countries studied, with output per hour worked about 25 per cent below France and about 10 per cent below the US. As our aggregate analysis highlighted labour productivity as the primary driver of low output in the UK, we have focused our work on understanding the UK's labour productivity performance in more detail. This revealed that the UK's relatively low labour productivity is driven by the operational-level impact of two areas of external regulation:

¶ **Labour market restrictions:** UK food retailers take advantage of flexible labour markets to provide a plethora of relatively low value-added services, like bag packers and extensive store cleaning crews. There are noticeably fewer of these workers in French stores, as, in many cases, they are artificially "cut off" by France's high labour costs. The low value-added workers tend to depress overall labour productivity, although they result in a higher service level offering and potentially more non-price competition between retailers. Furthermore, excluding low value-added workers and the services they provide depresses sectoral output and employment.

¶ **Land use restrictions:** The UK has a complex, locally driven planning regime, which has increasingly made it difficult, time consuming and expensive for food retailers to find new sites and expand. While the Government did allow the industry to expand during the 1980s and early 1990s, recent regulatory changes will make it more difficult for food retailers to evolve in the future. Land use policies affect labour productivity in two ways. Firstly, the UK has a lower productivity format mix than the US or France, as there is a greater proportion of UK

employment in relatively inefficient corner grocers and specialist shops; and secondly, modern large-format food retail outlets are smaller in the UK than in the US or France, denying food retailers the full labour productivity benefits of scale. By raising the cost of land, these policies may also have encouraged the industry to focus on more on space than on labour productivity.

There clearly are good things happening in the UK food retail industry. Competition has led to widespread innovation and consumers have benefited accordingly. UK food retailers have innovated in private label products, are recognised as the international leaders in supply chain management, and have increased competition in other sectors of the UK economy, such as financial services and petrol retailing.

However, recent tightening of UK planning regulation has essentially frozen the evolution of the industry, locking retailers into their current format and size mix and denying them the flexibility to evolve. While these regulations have been put in place for legitimate social reasons, decision makers should be aware that they have significant economic consequences in that they prevent the most productive food retailers from driving productivity improvements within the industry, and create a price umbrella under which less productive operators can survive. Additionally, they constrain a number of innovative companies that, in a more open environment, could continue to drive growth in productivity, employment and output across several other sectors of the economy, in particular general merchandise retailing.

Food Retailing

INTRODUCTION

This case study benchmarks the performance of the UK food retailing sector against that of the US and France. Food retailing is a critical industry because it is a huge source of employment, especially for lower-skilled workers. It employs almost 1 million people in the UK, or approximately 4 per cent of the workforce (Exhibit 1). The industry has also traditionally provided a way for young people to enter the workforce and served as a source of supplementary income for older people and people who want to work part-time to fit with their family needs: as a whole, food retailing employees are paid less, and are disproportionately female and part-time (Exhibit 2). In addition, food retailing is becoming increasingly interconnected with other industries, so that its performance has strong spillover effects into other parts of the economy. It is also an interesting industry to study because it allows the comparison of output, productivity and employment in a retail service industry that is relatively income inelastic.

It is difficult now – and will get more difficult in the future – to define pure "food retailers", as the line between food and non-food retailing is becoming increasingly blurred. However, to make like-for-like comparisons between countries, we focus specifically on sales of grocery items[1] in grocery and mixed retailing outlets, excluding non-food items sold in food retail outlets such as clothing, appliances and petrol. While non-food still makes up a relatively small portion of turnover in the US and the UK, it accounts for almost one third of turnover in French food retailers (Exhibit 3).

The UK food retailing industry is essentially split into three tiers: the "Big Four", other multi-outlet retailers, and the traditional/specialist retailers. The "Big Four" food retailers – Tesco, J Sainsbury, Asda and Safeway – control roughly 40 per cent of the food retailing market (more in specific areas such as fresh food and meat), and are considered to be world-class performers. The second-tier multi-outlet formats include traditional grocery stores, such as the Co-ops, and discounters, such as Aldi. The UK still has a strong traditional sector, with numerous butchers, bakers, fishmongers and corner grocery stores.

The UK food retailing sector has been very successful. After rapid development and expansion in the 1980s and 1990s, it has reached world-class total factor

[1] Grocery items include health and beauty, cleaning and household consumables

productivity levels, despite operating in a constrained environment. The top players are some of the most admired companies in both the UK and internationally. They provide a growing range of value-added services to their customers, and have developed global best practice in supply-chain, category innovation and space management.

PRODUCTIVITY PERFORMANCE

The UK food retailing industry employs about 10 per cent more people per capita than the US and 65 per cent more than the French. The UK has the lowest labour productivity of the three comparison countries studied, trailing the US by about 10 per cent and France by about 25 per cent (Exhibit 4). However, because of its extremely high space productivity (used as a proxy for capital productivity), it has similar total factor productivity to France, with both countries about 15 per cent above the US (Exhibit 5).

Details of the methodology used to calculate productivity are provided in the Appendix. Key points to note from this are:

¶ The definition of output in the food retailing industry is *total gross margin*. While this is not a perfect measure of value-added, it is the best proxy available.

¶ Capital inputs are defined as square metres of selling space. Again, we recognise that selling space is not a perfect proxy for total capital services, but it is the best available measure for the industry.

REASONS FOR DIFFERENCES IN LABOUR PRODUCTIVITY

Exhibit 6 shows the framework with which we have analysed the productivity gap across all the sectors studied. It divides the causes for the productivity gap into three groups. At the lowest level, productivity differences are caused by differences in production processes within firms. These differences are driven, however, by factors external to the firm within both the industry sector and the economy at large.

Low productivity in the UK food retailing sector is caused by the operational-level impact of two areas of external regulation – labour and land. Overall, the most important difference between the UK and France is the UK's extensive use of low value-added workers, facilitated by its flexible labour market. The remainder of the gap with France, and the whole of the gap with the US, is due differences in format mix and store size, both of which are driven by land use regulations (Exhibit 7).

Labour market regulations

The UK has a highly flexible labour market, with (at present) no minimum wage and liberal rules on the use of part-time workers. Roughly 60 per cent of workers in the UK food retailing industry work part-time, compared to 40 per cent for the US and 30 per cent for France. The food retailing industry takes advantage of this flexibility to provide a plethora of low value-added services in its stores – services that are provided significantly less in France because of France's high minimum wage and high employer costs.

Food retailing has traditionally employed low paid, low skilled workers. The high French minimum wage is a deterrent to employing these workers – about 30 per cent of UK full-time workers and 60 per cent of UK part-time workers are paid less than the French minimum wage (Exhibit 8). This is compounded in France by the other costs that must be borne by French employers. For every 100 francs French employers pay in wages, they pay an additional 49 francs in benefits, making French workers even more expensive (Exhibit 9). The high labour cost has a direct impact on operations.

France's minimum wage and inflexible labour markets limit the provision of low value-added services. UK food retailing stores provide a number of services that are far less commonly offered in French stores, for example "queue busters", a large number of open check-outs and in-store customer representatives to stimulate demand, extremely clean stores and constantly rotating stock. Workers involved in these tasks are paid low wages and have relatively low physical productivity. If these services were to be provided as widely in French stores, French labour productivity would decline by roughly 17 per cent (Exhibit 10). In essence, France has high labour productivity for the wrong reason – their consumers are not benefiting as much as consumers in the US and the UK, less output is produced and employment is lower.

One tangible example of how the number of low value-added workers affects consumers is found in the average time to pay for goods across countries. Adjusting for opening hours and the number of stores, the UK has the most checkout hours per capita in large format stores of the three comparison countries, and consumers spend less time paying for their goods. On average, it takes roughly 10 per cent longer to pay for goods in a typical US food retail store (Exhibit 11).

Land use regulations

The UK has a complex, locally driven planning regime, which has increasingly made it difficult, time consuming and expensive for food retail stores to find sites and expand. In the past, there was no specific national regulation preventing the development or expansion of UK food retailing stores. However, the national Government played an important role in setting the tone for expansion by acting as the final arbiter in disputes between town planners and food retailers. During the 1980s and early 1990s, the Government promoted growth by approving appeals by food retailers. However, the mood of the Government changed in 1993. Reacting to fears of “high street flight”, the Government revised Policy Planning Guideline 6 (PPG 6, “Town Centres and Retail Development”) forcing local planners to follow a “sequential approach” for selecting sites, favouring in-town over out-of-town developments. PPG6 was revised again and tightened in June 1996, creating “tests” that retailers had to pass to prove their stores would not hurt town centres, as well as introducing “need” for retail space as a key factor for planners to consider (Exhibit 12 presents an overview of the planning system).

France also has a restrictive planning regime. The Loi Royer, passed in 1973, required local authorisation for all sites greater than 1,500 square metres. By limiting the development of department stores and shopping malls, Loi Royer indirectly promoted the growth of hypermarkets – as it is no more difficult to obtain permission for a 20,000 square metre site than a 2,000 square metre site, retailers had incentives to go for the largest site possible. Whereas UK regulation affects the *size* of food retailers, French regulation affects the *number* of food retailers. By contrast, land use regulations in the US have little impact on food retailers. For all intents and purposes, they can build what they want where they want.

Land use regulation has affected UK food retailers in two ways:

¶ **UK has more traditional stores:** Despite significant expansion and evolution over the past 15 years, the UK has a less productive format mix than the US and France.

- The food retail industry can be broken down into four types of store, each of which has its own business system and / or value proposition to the customer: large format food retailers, discount stores, convenience stores and traditional / specialist stores (definitions and examples in Exhibit 13). Both the US and France have a more developed format mix – increasingly focused on modern stores – than the UK, which has more employment in traditional, less productive stores. Of the three countries, the UK has the smallest percentage of its turnover in large-format stores, while the US has the smallest percentage of its turnover in traditional / specialist stores (Exhibit 14). As large format stores are significantly more productive with their labour, the UK pays a modest productivity penalty for its format mix. Given the French format mix, the UK’s productivity would increase by about 5 per cent.

- The UK food retailing industry significantly expanded and evolved during the 1980s and the early part of the 1990s, bringing its format mix more in line with those of the US and France. Large food retailers gained about 35 per cent market share between 1980 and 1995 (Exhibit 15). Although there was no specific national policy dictating that local planning authorities should allow the creation of these large, out-of-town stores, the permissiveness of the UK Government on appeals is evidenced by the more than four-fold increase in large, out-of-town superstores between 1980 and 1995 (Exhibit 16).

- However, the more restrictive approach embodied in PPG6 has halted the evolution of the food retail industry reducing the opportunity for productivity growth. Analysis of local plans created after PPG6 was tightened in 1996 shows that most local councils are no longer allocating space for large stores (Exhibit 17). Additionally, the "needs" test is being considered more frequently in planning appeals. In the future, this will make it increasingly difficult for food retailers to obtain permission to build large out-of-town stores.

- Land use regulation has hurt the domestic competitive intensity of the UK food retailing industry.

  – While it is difficult to obtain concrete evidence on the competitive intensity of an industry, most indicators suggest that amongst the top players, there is strong competition. There are only a handful of top players, but they compete against each other in almost every local market in the UK. Thus, there is a strong incentive to innovate and provide new value-added services, and new developments spread rapidly across the country. For instance, when Tesco introduced a loyalty card scheme in 1995, both Safeway and Sainsbury quickly followed suit for fear of losing customers.

  – However, the difficulty of obtaining planning approval prevents the most productive retailers from driving out more inefficient players, and as such is limiting competitive intensity across the sector as a whole leading to a wide range of performance levels (Exhibit 18). In addition, it is more difficult for productive foreign players or new UK formats to enter the market. For example, it took Costco, a US warehouse club, almost two years to obtain planning permission for a new store.

¶ **"Large" stores in the UK are smaller than in the US or France:** The average large-format food retailing store in the UK is roughly half the size of a typical US store, and two-thirds the size of a typical French store (Exhibit 19), denying UK food retailers the benefits of scale. This accounts for roughly 50 per cent of the productivity gap with the US, and roughly 25 per cent of the productivity gap with France. Given the current planning regime, it is unlikely that UK stores will be able to expand or find bigger sites to capture these scale effects.

About 90 per cent of workers in food retailing are involved in store operations. Interviews and regression analysis[2] of the effect of size on store operations indicate significant scale effects on labour productivity. We estimate that each extra 100 square metres of selling space adds about £20 to output per employee. Size affects three areas of operations (Exhibit 20):

- *Overall store management*: Store management makes up about 10 per cent of in-store labour in an average-sized store and is relatively fixed. Even if a store doubles in size, it generally uses well under twice the amount of management.

- *Goods flow*: Up to 25 per cent of workers in a typical food retailer are involved in stocking shelves. Larger stores provide some scale economies by allowing workers to make proportionally fewer trips to the backroom to load shelves. In addition, larger stores typically have wider aisles, allowing the use of larger trolleys.

- *Ancillary services*: Services like bakeries and delicatessens typically make up about 15 to 20 per cent of in-store labour. A typical counter needs to have at least two workers on it at all times. However, as a store gets bigger, there is little need to employ proportionally more workers on these counters. This effect is offset to a degree as larger stores tend to have more ancillary services.

Non-differentiating factors

Several factors investigated proved to be either non-differentiating or preferential for the UK.

¶ **Technology**: The use of scanning technology, which allows labour to function more efficiently, is almost ubiquitous in all three countries. More than 90 per cent of the food retailers in the US and the UK now use scanning technology, with the prevalence a little lower in France.

¶ **Labour skills and motivation**: While they do admit that the incoming skill of their workers is not always high, UK retailers have not found it difficult to train workers to reach maximum proficiency. UK retailers have developed standardised procedures that have made it possible for workers to reach high productivity levels. Food retailing is an example

[2] One problem with regression analysis is that it might pick up "reverse causality"; that is, the most productive firms could create the biggest stores. However, interviews indicate the scale effect holds within firms as well as across firms.

of how good organisation of functions and tasks can address a perceived skill gap.

¶ **Provision of high value-added services**: Services such as fresh counters and bakeries employ more high-wage, high value-added workers, and are not affected by French labour laws. While it is difficult to estimate the overall provision of these services across countries, the mix of products and services offered in stores has little impact on labour productivity. Non-food departments have low "item" productivity (or items sold per hour worked) compared to traditional grocery departments, but they do not drain labour productivity because of their high gross margin per item and the fact that they raise the overall productivity of other departments by increasing output (Exhibit 21).

REASONS FOR DIFFERENCES IN SPACE PRODUCTIVITY

The UK's space productivity, which we use as a proxy for capital productivity, is almost twice the level of the US, and about 50 per cent higher than France (Exhibit 22). The primary external reason for high space productivity is the extremely high cost of space in the UK which has helped drive innovation to boost throughput. For example, the top UK players are considered to have world-class supply chain management practices. The UK also has relatively high margin products. The UK's high space productivity is to a degree analogous to France's high labour productivity; while the productivity figure is high, it comes at the cost of increased consumer welfare in the form of a somewhat less pleasant shopping experience than the US because of more crowded stores.

Higher land costs

The primary reason for the UK's low use of space relative to both France and the US, and conversely why that space appears more productive, is that retail rental rates (used as a proxy for land costs) are significantly higher in the UK. While it is difficult to make precise comparisons, interviews and statistical analysis indicate that like-for-like square metres of selling space in the UK are up to 40 per cent more expensive than in the US, and 15 per cent more than in France (Exhibit 23). This is partly because of competition for scarce plots of land, but is also a function of the planning process, which experts say contribute significantly to the high cost of UK selling space.

The distorted factor costs faced by UK retailers have implications for store size and space productivity. Given the high cost of space, it is rational that UK stores should be significantly smaller than their counterparts overseas. While consumers benefit marginally from additional space – in the form of more room to navigate shopping trolleys – from a UK food retailer perspective, that extra space is not cost effective.

High space productivity in the UK is analogous to high labour productivity in France. Distorted factor costs artificially restrain the use of those inputs so fewer value-added services are offered to the consumer.

Higher throughput

Sales per capita are not significantly different between the US, UK and France. However, as there is significantly less space per capita in the UK, the UK achieves much higher space productivity. Essentially, the UK is selling close to the same amount of goods in 50 to 75 per cent of the space. The UK is able to achieve this in two ways:

¶ **Physical store environment:** UK large format stores have significantly less open space than their counterparts in France and the US. For example, the space between aisles in a typical UK store is about 15 per cent less than France and about 25 per cent less than the US (Exhibit 24).

¶ **Supply chain management:** According to industry experts, top UK food retailers have developed world-leading supply chain management practices. Supply chain management in UK stores is sophisticated, especially on the management of information flow to suppliers. For example, once an item is scanned and purchased from a store, the recorded inventory is automatically updated. A fully automated ordering system, directly linked with the supplier, allows shorter lead times. Additionally, store scan information is linked to detailed daily forecasting models which take into account a wide range of variables such as the time of the year and weather patterns. The UK's strength in supply chain management helps food retailers achieve very high levels of availability, ensuring that customers can (nearly) always buy what they need. While some US and French firms have sophisticated supply chain management systems, their use is more prevalent and more advanced in the UK. This allows the UK to generate greater output per unit of space than the US or France. In essence, the UK's superior supply chain management skills put it on a higher space productivity curve than the US or France. Thus, we would expect UK stores to be somewhat smaller, even in the absence of all regulations.

Higher margin per £ sold

In a competitive retail market, the absolute gross margin is the value consumers place on the bundled delivery of goods and services. For instance, more convenient stores that provide more service should earn a higher gross margin than those that are less convenient. The US has the highest gross margin per unit sold, as it has the most convenient stores, the widest product range and the highest service level. Not only does the US have more stores per capita than the UK or France, the average US supermarket is open 120 hours a week, and almost 40 per cent of stores are open 24 hours a day. While UK stores have been increasing their opening hours in recent years, the typical store is still only open 80 hours a week. The US also has a very wide product range, with the typical store providing about 2,000 more SKUs (product lines) than the typical UK store (Exhibit 25).

However, the UK has a clear advantage over France and the US in its use of own-brand products. Own-brand products can serve two functions. They can be a low-cost alternative to products found in discount stores, or they can be a "premium" value-added product. In both cases, the value added by the food retailer is higher than for a branded good from a food processor. UK food retailers have been particularly successful in creating powerful brand images, to the point where Sainsbury's own-brand products have been exported to countries such as Brazil. More than a third of the UK grocery sales for the leaders are own-brand, compared to roughly 20 per cent in the US and 15 per cent in France (Exhibit 26). The UK's high own-brand penetration could be seen, at least in part, as a failure of some sectors in the UK food processing industry. As explained in the food processing case study, food retailers have, at least to some extent, been filling a void created by the lack of innovation and marketing by some food processors. However, in some undifferentiated products, undue product proliferation by the food retailing sector is actually dragging down food processing productivity by introducing complexity into manufacturing processes. This results in lower productivity in the entire food chain.

The UK has also been very successful in encouraging consumers to "trade up" to higher value-added goods, such as preprepared meals. The UK has a clear lead over France and the US in the home-meal replacement market, which is one of the fastest growing sectors in the grocery industry. One tangible example of the success of the UK in promoting these trade-ups is in the soup market. While packet, canned and instant soup sales have all fallen over the past 5 years, sales of fresh chilled soup have increased at a rate of more than 30 per cent a year (Exhibit 27).

FUTURE OUTLOOK AND RECOMMENDATIONS

Future outlook

The UK food retailing industry has been very successful, with high levels of innovation and competition. Additionally, constraints to evolution have encouraged food retailers to search for new avenues for growth, such as new forms of delivering goods to consumers and entering new markets. Through entering new markets, the food retailers have helped stimulate competition and innovation in other sectors of the economy (Exhibit 28). For example:

- **Financial services**: UK food retailers offer higher interest rates on current accounts than many of the major banks. This has allowed the food retailers quickly to capture more than 1 million accounts.

- **Petrol**: The top food retailers are now major players in the petrol retailing sector. As the food retailers began to gain greater and greater share of the petrol market, traditional petrol retailers responded by cutting prices to try and win back share. The price war did not significantly damage UK food retailers, because their higher throughput made their economics fundamentally superior to those of more traditional petrol retailers. The end result was significantly lower petrol gross margins across the entire industry, which clearly benefits consumers. Lower margins in the UK petrol market generated roughly £10 per annum for each consumer in the UK (Exhibit 29).

As the industry continues to stimulate competition and innovation across the UK, food retailing could act as an engine for UK growth. However the UK's format mix is still sub-optimal for productivity, and its stores are still relatively small. Recent Government actions seem likely to "freeze" the industry in its current state. Not only will this leave the UK's evolution incomplete – preventing the most productive players (either existing or new) from gaining further market share and increasing overall industry productivity – it denies the industry the flexibility and adaptability to change in the future. In addition, the performance of the entire retailing sector may be constrained as competition between food and non-food players is limited. Finally, it creates the potential for the UK's currently world class food retailers to fall behind global best practice, preventing the successful global expansion of UK-based companies.

Industry recommendations

In the future, we expect the industry to continue to develop its food retailing business while also continuing to expand into other sectors.

- **UK retailers will continue to develop the food retail business.** Major retailers will continue to adapt their formats to the high street (e.g., Tesco Metro). This is likely to happen regardless of changes to PPG6, and will allow the major food retailers to target the residual inefficiency of traditional stores.

  At the same time, food retailers will continue to look to boost output by searching for new delivery mechanisms, such as home shopping and the Internet. The UK's comparative advantage in supply chain management, combined with low labour costs, positions it as a front-runner as new transaction types begin to make serious inroads in the marketplace. These new value-added services will allow UK food retailers to boost output and employment.

¶ **Expand into other sectors:** Food retailers have among the strongest brand names in the UK. They will continue to leverage their brand names, and add new value-added services that are not limited by space constraints (such as financial and/or travel services). Subject to potential changes in land use regulations, food retailers may also further challenge general merchandisers.

In addition, we believe the industry should continue its hitherto successful policy of encouraging consumers to trade up to higher value-added goods; this could boost both output and employment. It should also work with food processors to improve their performance. As explained in the food processing case study, this sector is about 25 per cent less productive than that in the US. As a result, UK food retailers face higher input prices. Some sectors of the food processing industry have shown a lack of innovation, leaving a void for the food retailers to plug with their extensive range of own-brand products. It is in the best interests of both food retailers and food processors to work together to increase mutual productivity.

Government recommendations

The food retailing industry has the potential to push several industries in the UK into the virtuous circle of productivity and output growth, while also innovating to provide services to UK consumers. To maximise the potential of this industry, the Government should:

¶ **Keep labour markets flexible:** Innovation has, to some extent, been driven by flexible labour markets that have allowed the industry to experiment with new services. It has also allowed the industry to provide employment opportunities to a wide range of people. France shows how artificially high labour costs can reduce employment, and hence value-added in a sector.

The high labour costs and inflexible labour market in France may also have stifled the development of certain new types of service. For example, one French store manager told us that he was interested in adding a home delivery service. However, because of the high cost of adding additional labour and the difficulty of firing or re-deploying these workers, he felt unable to offer the service in case it was not successful. Furthermore, he felt he would have to charge a very high price for it. As a result he did not develop it.

To allow food retailers to continue to provide a wide array of low value-added services, the Government should ensure that the proposed minimum wage does not raise employer costs to the point where operators will no longer find it economic to provide those services.

¶ **Consider the impact of protectionist product market policies:** Well-intentioned regulations can often have unintended adverse consequences. Some regulations make it difficult for food retailers to expand their in-store offer, and the Government needs to consider the social cost of these policies. Pricing restrictions on perfume and over-the-counter drugs and laws that allow companies to resist selling their product through certain retailers have some social benefits. However, the Government must ensure that policies that protect potentially inefficient producers do not harm the economy.

¶ **Further consider the economic costs of land use restrictions:** There are social benefits to restricting the use of land, and it is the role of Government to balance these benefits against the economic cost. In making this trade-off, the following should be considered:

- ***Impact of PPG6:*** Recent tightening of the planning regime via PPG6 has severely limited the evolution of food retailing, especially into areas that require space.
  - If PPG6 were removed, UK food retailing would be able to continue its evolutionary process. This would entail the further expansion of the "modern format" – especially large-format retailers – and further contraction of the "traditional sector." There are social arguments against displacing traditional high street retailers. From a purely economic perspective, however, the benefit would be a modest productivity boost, and hence lower prices.
  - While the potential productivity boost to get to *today's* ideal food retailing format mix is modest, another important effect of PPG6 is that it stops grocers developing *tomorrow's* ideal format. This means not only that UK food retailers may not develop the "next" leading-edge format, but also that a leading-edge format developed overseas but requiring a large amount of space may not come to the UK. In effect PPG6 may be creating barriers to the entry / expansion of the future's most productive retailers.
  - An example of this is the impact the tightening of PPG6 has had on new delivery mechanisms. Food retailers are experimenting with both delivery and "collect" services. In "collect" services, consumers telephone or e-mail their order, and then pick up the pre-packed groceries from their supermarket. Food retailers currently offer "collect" services out of existing stores, but there

could be operating efficiencies from developing stand-alone collection units. As these "collection units" technically constitute "food retail" space, it may prove difficult to obtain planning permission for their development, even if the units are located in industrial parks.

- ***Overall impact of restrictive planning regimes***: Allowing food retailers to expand their store sizes significantly would allow UK food retailers to expand their non-food offer. While this may increase productivity of the *food retail* industry only marginally, it would allow food retailers to challenge more aggressively general merchandise retailers, and, perhaps, improve the performance of the broader *retail* industry. With the retail industry overall accounting for around 10 per cent of the economy, any action to increase its productivity could have a significant impact on the overall economy.

Appendix: Methodology for productivity calculations

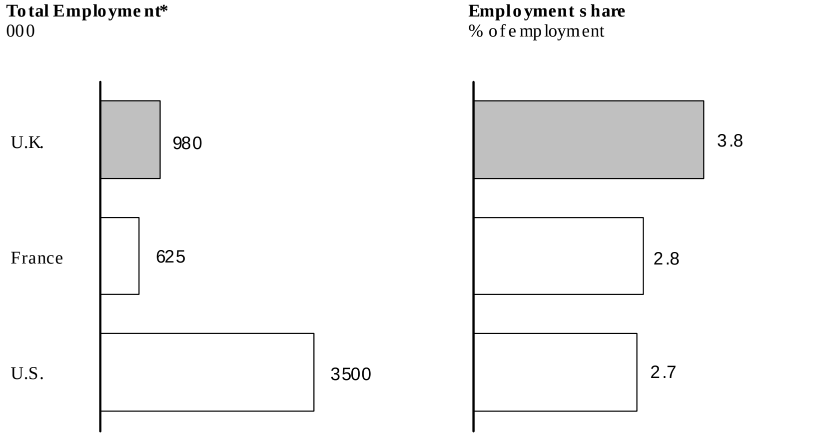
To compare the performance of the UK food retailing with that of other countries we investigated output, labour and selling space inputs and labour and selling space productivity.

- ¶ **Output**: Our output measure is total gross margin, which is defined as sales less cost of good sold. The figures presented in this report are based on the OECD food PPP. While we initially had some concerns that the OECD PPP would not fully pick up differences in service levels between countries, cross-checking indicated that this was not the case. To cross-check the OECD PPP, we constructed our own PPP based on a basket of goods purchased at a similar store in all three countries. As there are few truly international food retailing players, it is difficult to pick a reasonable sample, but we selected an international hard discounter with operations in all three countries. We selected stores that had similar opening hours, SKU (product line) range, levels of service, number of checkouts, etc., and compared the prices of a basket of about 75 goods. The constructed PPP and the OECD PPP yielded similar results.
- ¶ **Labour inputs**: Total hours worked, including self-employed workers. As there are many small, independent food retailers, there may be some margin of error around our hours worked estimates, although we do not believe this will significantly affect our results.
- ¶ **Selling space inputs**: Total square metres of selling space was used as an estimate for capital inputs. We acknowledge that this is a flawed proxy, as it assumes all metres of selling space are the same. We have some directional evidence to support the notion that UK retailers invest more in fixtures and fittings per square metre than US or French retailers, but no statistics are available to calculate these figures for the entire sector.
- ¶ **Labour productivity**: Output per hour worked.
- ¶ **Selling space productivity:** Output per square metre of selling space.
- ¶ **Total factor productivity**: Labour and space productivities were combined using a Cobb-Douglas function with value added shares of labour and capital of 60 per cent and 40 per cent respectively. These

figures are based on OECD National Accounts for the entire retail sector.

Exhibit 1

FOOD RETAIL EMPLOYMENT

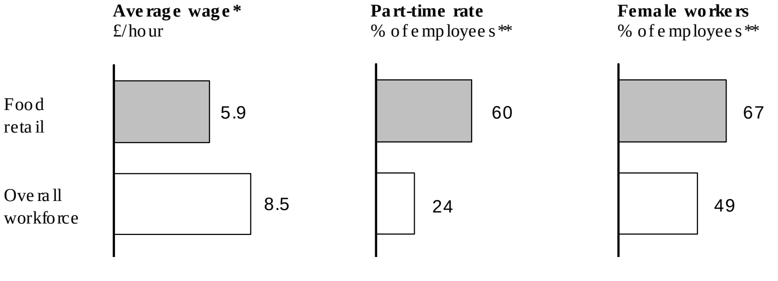


* Figures are for all workers in food retail, not adjusted for part-time workers

Source: SDA25; Labour Market Trends (Workforce in Employment Survey); OECD PPPs; Progressive Grocer; Verdict; HBD; INSEE; Eurostat; NCSA; BEA; U.S. Census of Retailers; AC Nielsen; McKinsey analysis

Exhibit 2

MAKE-UP OF FOOD RETAIL WORK FORCE IN THE U.K., 1995



* Wage figures are for full-time employees only; average hourly wage for part-time female workers in the food retailing sector is around £4

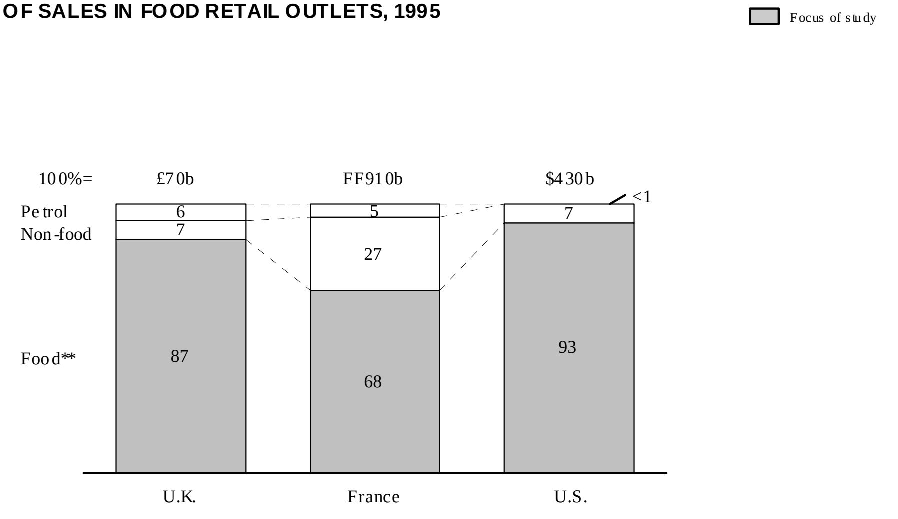
** Does not include self-employed

Source: Labour Market Trends; New Earnings Survey; McKinsey analysis

Exhibit 3

BREAKDOWN OF SALES IN FOOD RETAIL OUTLETS, 1995

% of sales*



* Sales are ex-VAT

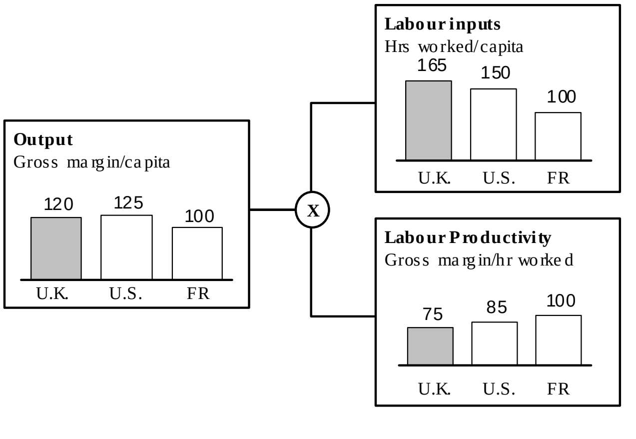
** Food includes traditional grocery items such as health & beauty and household cleaners

Source: SDA25; Labour Market Trends (Workforce in Employment Survey); OECD PPPs; Progressive Grocer; Verdict; HBD; INSEE; Eurostat; NCSA; BEA; U.S. Census of Retailers; AC Nielsen; McKinsey analysis

Exhibit 4

FOOD RETAIL SECTOR LABOUR PRODUCTIVITY*, 1995

Gross margin/hr worked; Indexed to France = 100



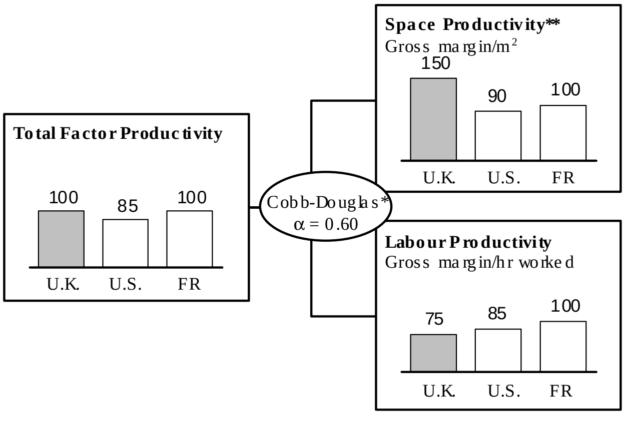
* Converted with OECD food PPP

Source: SDA25; Labour Market Trends (Workforce in Employment Survey); OECD PPPs; Progressive Grocer; Verdict; HBD; INSEE; Eurostat; NCSA; BEA; U.S. Census of Retailers; AC Nielsen; McKinsey analysis

Exhibit 5

FOOD RETAIL SECTOR TOTAL FACTOR PRODUCTIVITY, 1995

Indexed to France = 100



* Cobb-Douglas production function, share of labour average of wholesale & retail trade from OECD National Accounts

** Space productivity used as proxy for capital productivity

Source: SDA25; Labour Market Trends (Workforce in Employment Survey); OECD PPPs; Progressive Grocer; Verdict; HBD; INSEE; Eurostat; NCSA; BEA; U.S. Census of Retailers; AC Nielsen; McKinsey analysis

Exhibit 6

CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

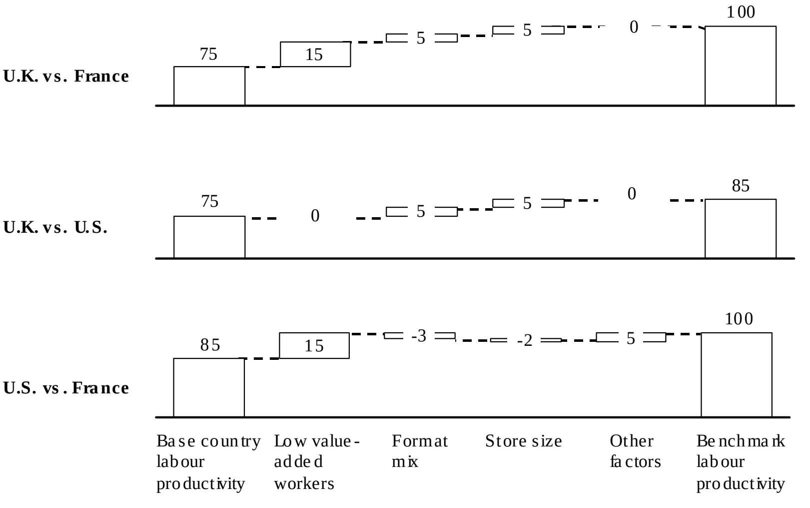
		U.K. vs. U.S.	U.K. vs. FR
External factors	• Fiscal and macroeconomic environments	-	-
	• Product market		
	– Trade/FDI barriers	-	-
	– Product regulations	●	●
	• Labour market		
	– Labour rules/unionism	-	-
	– Relative labour cost	-	●
	– Education	-	-
	• Capital market		
	– Corporate governance/government ownership	-	-
	– Access to capital	-	-
	• Other external factors		
	– Other industries /up and down stream	-	-
	– Country specific factors	-	-
Industry dynamics	• Competition with best practice	-	-
	• Domestic competitive intensity	-	-
Production process	• Mix of products and services/marketing		
	– Product category mix	○	○
	– Value added within category mix	-	●
	– Product proliferation	-	-
	– Pricing structure/marketing	-	-
	• Production factors		
	– Capital intensity/technology	-	-
	– Scale	○	○
	– Front line skills/trainability	-	-
	– Matching capacity to demand	-	-
	• Operations		
	– Organisation of functions and tasks	-	-
	– Design for manufacturing	-	-
	– Suppliers and supplier relationships	-	-
	Productivity performance (comparison country = 100)	**88**	**75**

Exhibit 7

COMPONENTS OF LABOUR PRODUCTIVITY GAPS

Indexed to France = 100

ESTIMATES

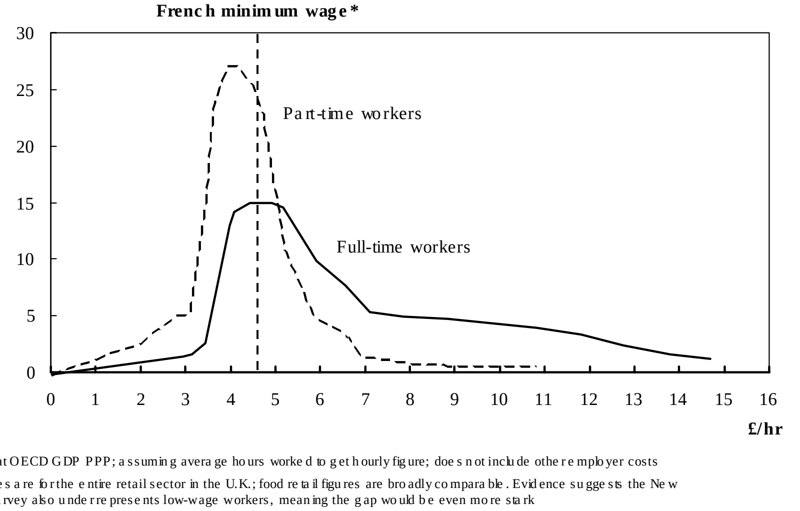


Source: McKinsey analysis

Exhibit 8

DISTRIBUTION OF U.K. RETAIL WAGES/HOUR, 1996

% of workers



* Converted at OECD GDP PPP; assuming average hours worked to get hourly figure; does not include other employer costs

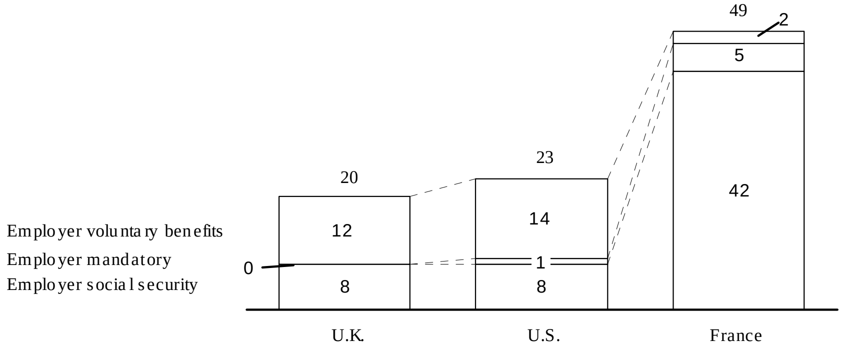
Note: These figures are for the entire retail sector in the U.K.; food retail figures are broadly comparable. Evidence suggests the New Earnings Survey also underrepresents low-wage workers, meaning the gap would be even more stark

Source: New Earnings Survey, 1996; McKinsey analysis

Exhibit 9

REAL COSTS OF LABOUR*

Indexed to country's average wages = 100

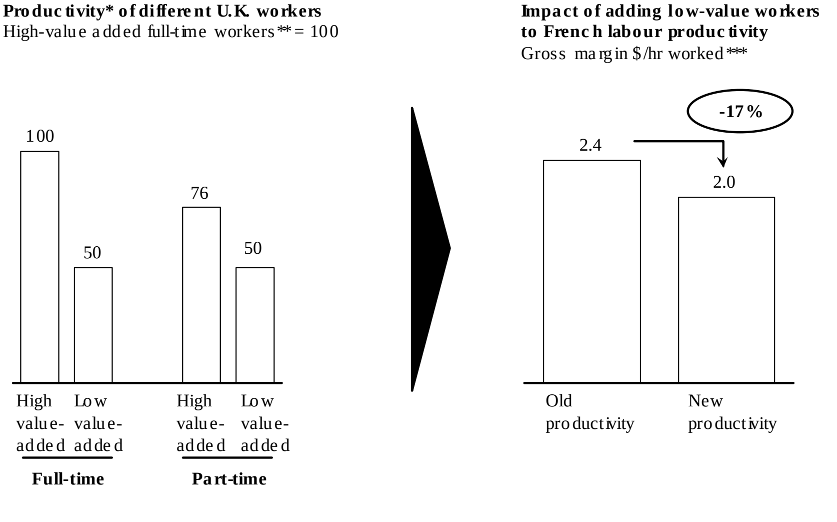


* Based on full-time male employees on national average earnings

Source: Sedgwick Noble Lowndes; McKinsey analysis

Exhibit 10

IMPACT OF ADDING LOW-VALUE WORKERS TO FRENCH STORES



* Wage rate assumed to be proxy for productivity

** High-value added workers are defined as all workers above French minimum wage

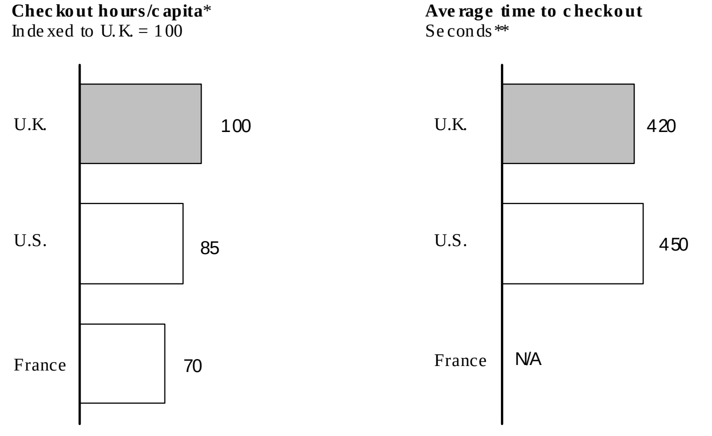
*** Converted at OECD PPP

Source: IGD; INSEE; ISA; New Earnings Survey; Store visits; McKinsey analysis

Exhibit 11

CHECK OUT SERVICE LEVELS BY COUNTRY

ESTIMATES



* Adjusted for food/non-food split and for differences in opening hours and utilisation rates
** In large format stores

Source: IGD; INSEE; ISA; Progressive Grocer; Chain Store Guide; Nielsen; Verdict; McKinsey analysis

Exhibit 12

EVOLUTION OF U.K. FOOD RETAIL PLANNING REGULATION

Basic structure

- Relevant local planning authority drafts 'Structure Plan' and/or 'Development Plan', which divides area under plan for different uses
- New development requires permission from relevant authority
- Local authorities must also follow government-issued 'Planning Policy Guidance Notes'
- Developments that are refused can go to appeal

PPG6, July 1993*

- Aimed to strengthen town centres while keeping an efficient, competitive and innovative retail sector
- Emphasised 'sequential approach' for selecting sites, favouring in-town before out-of-town

PPG6, revised, June 1996

- Created key tests for retail development:
  - Impact on vitality and viability of town centres
  - Accessibility by a choice of transport
  - Impact on overall travel and car use
- Also introduced 'need' for retail space as a key concern

* 'Planning Policy Guidance Note 6, Town Centres and Retail Developments'

Source: Department of the Environment; interviews; McKinsey analysis

Exhibit 13

SEGMENTATION OF FOOD RETAIL INDUSTRY

		Examples		
Segment	**Description**	**U.K.**	**U.S.**	**France**
Large-format food retailer	Multi-outlet, typically out of town supermarkets and hypermarkets; generally >1,000m^2, offer wide selection of both food and non-food products	Asda, Safeway, Sainsbury, Tesco	Albertson's, Kroger, Safeway	Carrefour, Auchan
Discount stores	Multi-outlet, offer limited service, bulk items at discount prices; can be limited range (<1000 SKUs) or very wide range	Kwik Save, Netto, Aldi	Sam's Club, Costco, Aldi	Aldi, Lidl
Convenience store	Multi-outlet, typically in town, offer limited selection of food/non-food, often <500m^2, open very long-hours	Europa Foods, Cullens, Alldays	7-11, Circle K	Huit-à-Huit, Prisunic
Traditional stores	Single-outlet grocers or specialists like butchers or fishmongers, typically small and in-town			

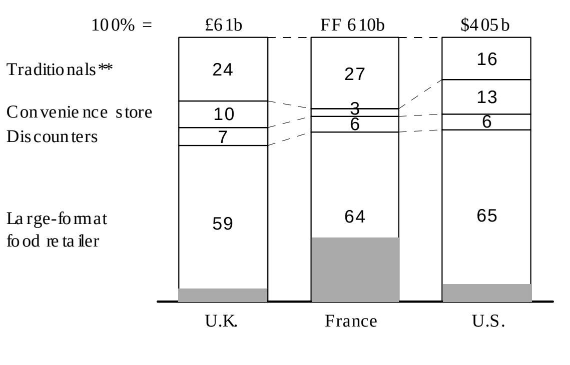
Source: Team analysis

Exhibit 14

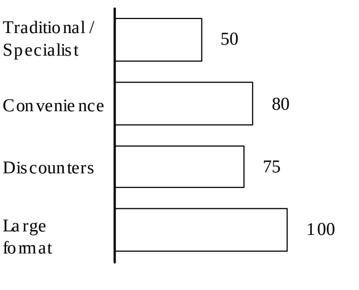
TURNOVER & PRODUCTIVITY OF FOOD RETAIL INDUSTRY, 1995

Estimated share of large hypermarkets***

Turnover* by format
% of turnover



Labour Productivity by format
Indexed to multi-format = 100



* Food sales in food retail formats only; non-food items (e.g., clothing, gasoline) excluded from figures

** Includes specialists and stores that sell alcohol; traditional stores and convenience stores can appear quite similar

*** Hypermarkets defined as extremely large (typically 5,000+m^2) stores selling large proportion of non-food items; estimated share of large-format food retailer segments: U.K., 1%; France: 25%; U.S.: 5%

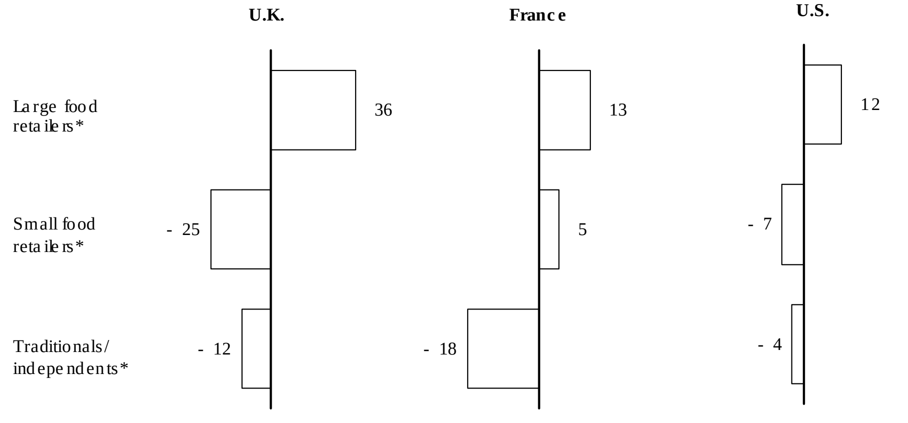
Source: AC Nielson; SDA 25; INSEE; IGD; Verdict; NACS; Census Bureau; Progressive Grocer; HRI; McKinsey analysis

Exhibit 15

CHANGE IN FORMAT MIX FROM 1980–95

ESTIMATES

% change in market share

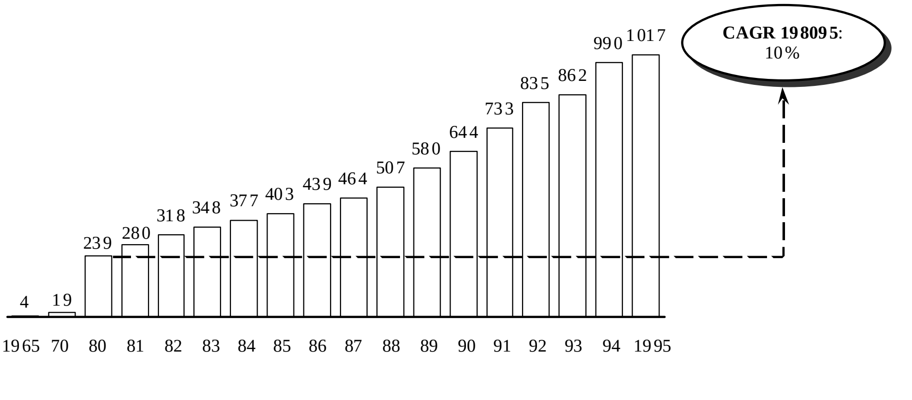


* For U.K. & France, large food retailers are all retailers that are greater than 1,000m², for the U.S. they are all chain supermarkets

Source: AC Nielsen; Progressive Grocer; McKinsey analysis

Exhibit 16

NUMBER OF SUPERSTORES* IN THE U.K.



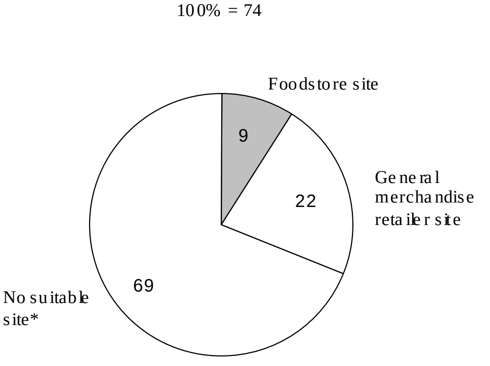
* Superstores defined as stores with more than 25,000 sq. ft. of selling space

Source: IGD

Exhibit 17

RETAIL ALLOCATION IN LOCAL PLANS AFTER REVISION OF PPG6 in 1996

% of plans



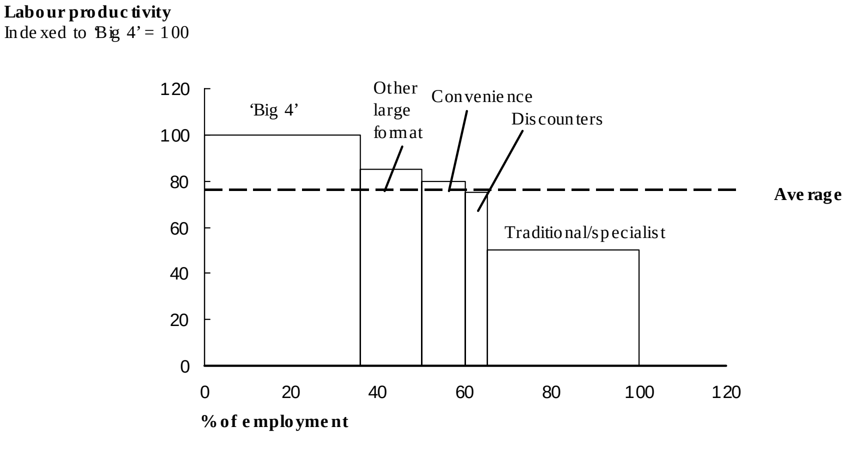
* No site allocated that is large enough to support a major food retailer

Source: Rapleys Consultants

Exhibit 18

CUMULATIVE LABOUR PRODUCTIVITY OF U.K. FOOD RETAILERS

APPROXIMATE

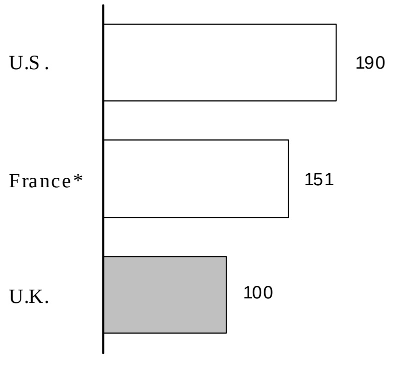


Source: Company accounts; SDA 25; McKinsey analysis

Exhibit 19

AVERAGE STORE SIZE OF LARGE FORMAT FOOD RETAILERS

m^2/store*; Indexed to U.K. = 100



* Adjusted to remove space of non-food items (French stores would be much bigger with non-food items included)

Source: U.K., U.S. company accounts; Verdict; INSEE; Atlas LSA; McKinsey analysis

Exhibit 20

EFFECT OF INCREASED STORE SIZE ON FOOD RETAILING LABOUR PRODUCTIVITY

Typical U.K. large format store

ESTIMATES

○ Little / no effect*
◑ Moderate effect*
● Strong effect*

	Overall management of store	Store appearance	Goods flow	Customer interface	Ancillary services (e.g., deli)
% of FTEs*	10%	5%	25%	40–45%	15–20%
Effect of store size*	●	○	◑	○	◑

* Little to no effect means 10% increase in store size leads to ~10% FTE rise; moderate effect means 10% increase in store size leads to 5–10% FTE rise; strong effect means 10% increase in store size leads to 0–5% FTE rise

Source: McKinsey practice experts; interviews with store managers, industry experts; Store model

Exhibit 21

LABOUR PRODUCTIVITY OF VALUE-ADDED SERVICES

ESTIMATES

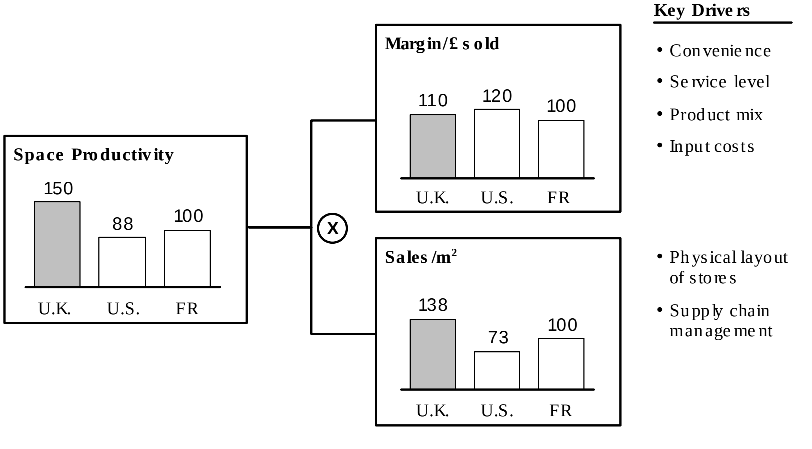
* Grocery departments are traditional grocery areas such as meat, produce and health and beauty items

Source: SG Warburg Securities; McKinsey analysis

Exhibit 22

DRIVERS OF FOOD RETAIL SPACE PRODUCTIVITY, 1995

Indexed to France = 100

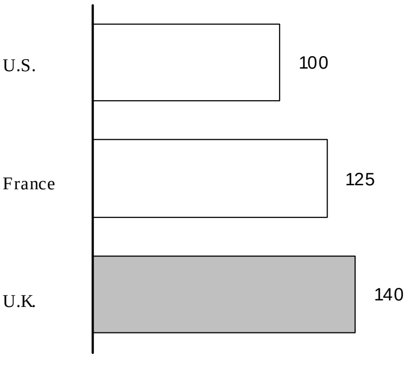


Source: SDA25; Labour Market Trends (Workforce in Employment Survey); OECD PPPs; Progressive Grocer; Verdict; HBD; INSEE; NCSA; BEA; U.S. Census of Retailers; AC Nielsen; McKinsey analysis

Exhibit 23

RELATIVE* RETAIL RENTAL RATES ACROSS COUNTRIES, 1997**

Indexed to U.S. = 100



* Calculated by comparing constructed food retail rental PPP to OECD GDP PPP

** U.K. rate taken from "modern, purpose built warehouse unit, edge-of-town", France from "Very good location, upper tier store characteristics," U.S. represents "Class A retail properties"; all figures are national

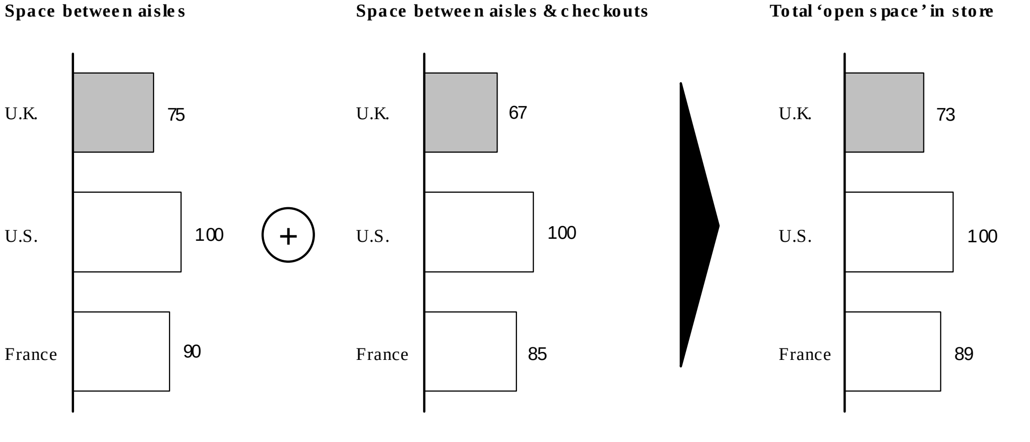
Source: CB Commercial; Valeurs Venales 01-01-97; Property Market Report, Aug 97; OECD PPPs; McKinsey analysis

Exhibit 24

INDICATORS OF LEVELS OF 'OPEN SPACE' IN STORES

Indexed to U.S. = 100

BROADLY INDICATIVE



Source: Store visits; interviews; McKinsey analysis

Exhibit 25

DRIVERS OF GROSS MARGIN

	U.S.	U.K.	France	Comments
Convenience				
– Location	●	◑	◑	• U.S. has most stores per capita
– Opening hours	●	◕	◑	• U.S. has longest opening hours
Service levels	●	●	◔	• Both U.S. and U.K. offer very high service levels
Product mix				
– % own brand	◑	●	◑	• U.K. has twice as many own-brand products
– SKU range	19,000	17,000	N/A	• U.S. widest SKU range
Input costs*	100	133	N/A	• U.S. has more efficient food processors
Total Gross Margin	**25%**	**23%**	**21%**	

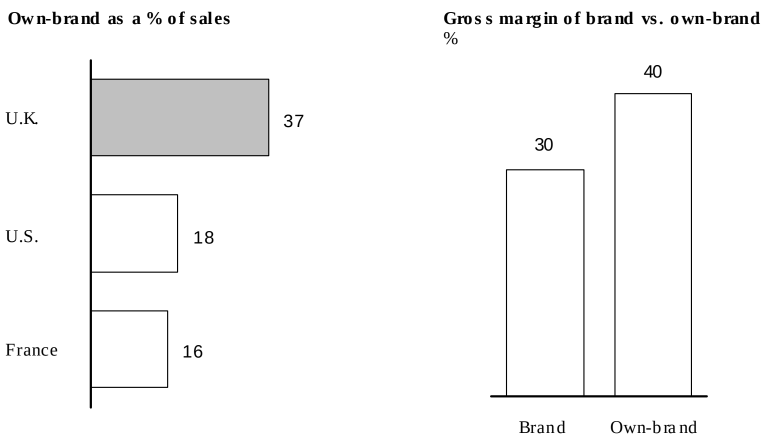
* Inverse of food processing total factor productivity

Source: Progressive Grocer; INSEE; McKinsey Global Institute study of food processing; McKinsey analysis

Exhibit 26

USE OF OWN-BRAND PRODUCTS IN STORES

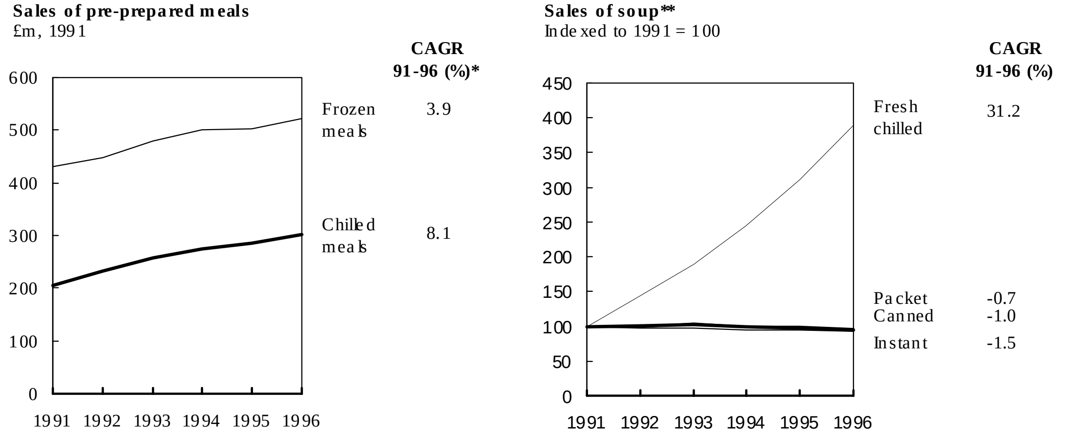
ESTIMATES



Source: IGD; Arthur Andersen; McKinsey analysis

Exhibit 27

GROWTH IN HIGH VALUE-ADDED GOODS



* Overall CAGR of food sales ~1.5%

** In 1996, canned soup roughly 63% of market, instant soup 17%, fresh chilled 11%, packet soup roughly 9%

Source: Mintel; Verdict; McKinsey analysis

Exhibit 28

FOOD RETAIL'S IMPACT ON OTHER INDUSTRIES

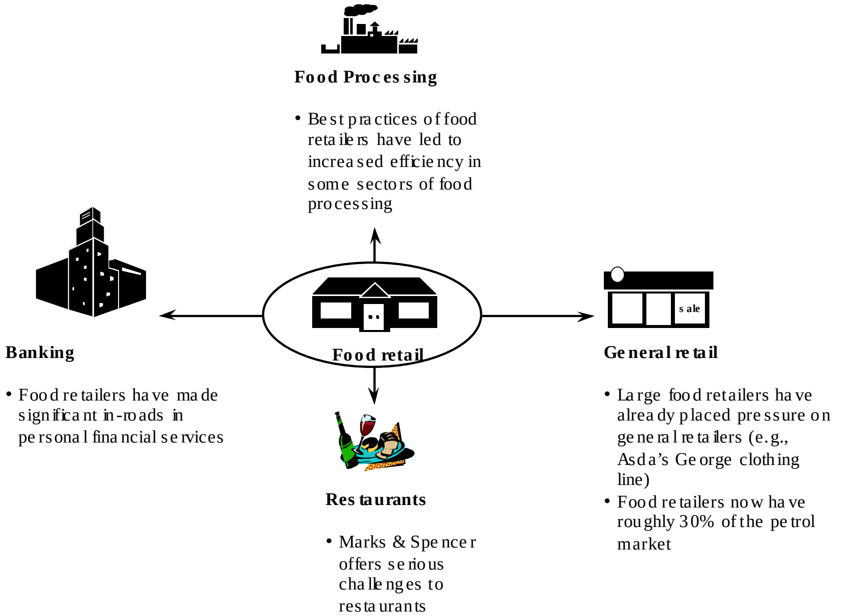
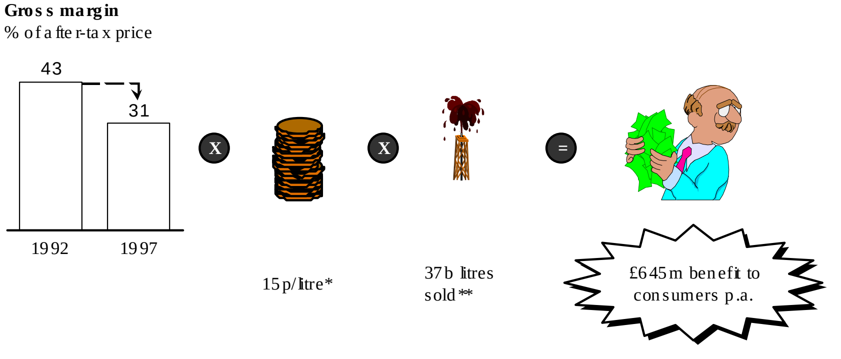


Exhibit 29

BENEFIT TO CONSUMERS OF FOOD RETAILERS ENTERING PETROL MARKET



* Average after-tax price between 1992 and 1997

** 37m m^3; assumes all petrol products have 1,000 litres/m^3

Source: OPAL Oil Price Assessments Ltd.; Financial Times "Future of Forecourt Retailing"; McKinsey Analysis

Hotels

EXECUTIVE SUMMARY

The hotel industry is the lynch-pin of the UK's leisure-related service sector – a large and increasingly important sector with huge growth potential. This case study benchmarks the performance of the UK hotel industry with that of the hotel industries in the US and France.

The UK has the lowest labour productivity of the three countries studied, with output per hour worked roughly 40 per cent below France and almost 50 per cent below the US.

The UK's productivity performance is primarily driven by the age of its hotel stock and the low penetration of large chains. The UK has significantly more old hotels and somewhat fewer large chains than France or the US. The UK's hotels are not "designed for manufacturing" and impose inefficient operating procedures. This mix of hotel stock is the result of high construction costs and lack of domestic demand:

¶ **High construction costs**: A poorly performing construction industry, combined with planning, listing and building restrictions, make it significantly more expensive to build hotels in the UK, to the point where new entrants are priced out of the market. This also lessens the opportunities for entry by chains.

¶ **Lack of demand growth**: In addition to slow population and income growth in the past 50 years, the UK has been far less strong at creating "destinations" than the US or France – only one of the top 10 UK tourist attractions was built this century, compared to six in France and nine in the US.

Secondary factors driving poor productivity performance include product/service mix, and scale. Labour skills and access to capital do not appear to be significant root causes.

Going forward, we believe that a combination of demand stimulation by the broader tourist industry and Government policies to reduce the barriers to the economic building of new hotel stock will allow new hotels to displace some of the unproductive older stock. This should boost productivity and output in the hotel sector, and make the UK a more popular international tourist destination.

Hotels

INTRODUCTION

The hotel industry is a key part of the UK's leisure-related service sector – a large sector with huge growth potential. The hotel industry itself currently employs more than 300,000 people, representing about 210,000 full-time equivalents, and has created 90,000 net new jobs in the last 10 years. In 1996 it generated revenue of nearly £8 billion, and contributed over £3 billion to GDP.

Hotel productivity and performance also affects the broader economy because the industry provides infrastructure for other sectors. According to the British Tourist Authority, tourism as a whole accounts for 7 per cent of total UK employment, and creates one in five new jobs. International tourism brought over £12 billion into the country in 1996, with one third of that spent on accommodation and the rest spread over sectors such as restaurants, travel, retail and entertainment. The hotel sector also underpins the UK's attractiveness as an international business destination.

For the purposes of this report, hotels are defined as all establishments for which the principal source of income is accommodation. The analysis therefore covers guesthouses and "bed and breakfast" accommodation (in so far they are captured in national statistics). It excludes accommodation that is ancillary to other services, such as rooms in pubs or lodging provided in leisure parks.

The chosen benchmark countries are the US, as the most mature service economy with a reputation for high levels of customer care, and France, which has the highest number of international arrivals per capita of any large economy and a strong food service tradition.

The hotel industry is fragmented in all three of the countries studied: while at one end of the market a substantial and increasing proportion of the hotel industry is operated as chains or under franchise arrangements, a large part of the industry is still composed of relatively small independent owner-operators, many of whom use the hotel as their home, and may rely on unpaid family labour. It is therefore difficult to obtain consistent and complete information on the industry. To overcome some of these difficulties, this study was supported by a telephone survey of 300 hotel operators in each country, together with extensive face-to-face interviews with a wide range of operators and other experts.

PRODUCTIVITY PERFORMANCE

Labour productivity in the UK hotel sector is currently around 53 per cent of the US level and 60 per cent of the French level (Exhibit 1).

National statistics do not provide enough data to calculate capital productivity for the sector. However, given that the average UK hotel is significantly older than the average French or US hotel (see later), we believe that much of the UK's capital stock will have been fully depreciated, allowing UK operators to provide the same service offering with fewer capital inputs. We expect, therefore, that the sector should have relatively high capital productivity and low capital intensity.

Further details of the methodology used to calculate productivity are provided in the Appendix.

REASONS FOR DIFFERENCES IN PRODUCTIVITY PERFORMANCE

Exhibit 2 shows the framework with which we have analysed the productivity gap across all the sectors studied. It divides the causes for the productivity gap into three groups. At the lowest level, productivity differences are caused by differences in production processes within firms. These differences are driven, however, by factors external to the firm within both the industry sector and the economy at large.

The primary causes of the UK's productivity gap versus the US and France at the production process level are the greater age of UK hotels and less use of standardised practices because of lower chain penetration. The external level factors that influence this are building and planning regulations, a poorly performing construction industry and a relative lack of UK demand growth.

Production processes

At the production process level, the main reasons for the UK's productivity gap with France and the US are the greater age of its hotel stock and less use of standardised processes. Service mix and hotel size play a significant but smaller role in explaining the gap.

¶ **Age of the hotel stock.** The UK has a much higher proportion of old hotels than either the US or France – roughly 75 per cent of rooms in UK hotels are in buildings that are more than 40 years old, compared to only 35 per cent in France and less than 25 per cent in the US (Exhibit 3). This imposes inefficient organisation of functions and tasks. For example, rooms take longer to clean, and storage space and public areas are less efficiently laid out in older hotels than in new hotels or old hotels that have been substantially refurbished. Essentially, old hotels are not "designed for manufacturing," and we estimate new or fully refurbished hotels use labour up to 30 per cent more productively than old ones.

Clearly, there are some examples of hotels in old buildings that are productive despite their high labour inputs. For a number of the UK's older buildings, the age of the building is itself part of the product offering and the hotel is able to charge a price premium to capture the value that customers place on historic surroundings. At an aggregate level, however, the rates charged by UK's older hotels fail fully to reflect higher labour intensity.

¶ **Less use of standardised processes because of lower penetration by large chains:** The UK hotel sector makes less use of standardised processes than either the US or France.

- *Standardisation is typically achieved by large chain or franchise operations:* Large chains generally have standardised operating procedures, which result in quicker check-in and check-out, more efficient cleaning, and better staff scheduling. Chains and franchises also have higher productivity because they can attract and retain the best staff and achieve some economies of scale in purchasing. In addition, superior reservation systems result in chains having higher yields than non-chains. We estimate that a new chain hotel would be up to 50 per cent more productive than a new, non-standardised independent hotel.

- *There are fewer large chains in the UK:* In all three countries studied, more than half of the hotel rooms available are in independent or small chain operations. However, the incidence of large chains is somewhat lower in the UK than in France and the US. Furthermore, where chains do exist, they are generally operating older hotels, which limits the advantages they can gain from standardised procedures - while some of the benefits of standardised operating procedures can be achieved in old hotels (for example, labour scheduling, streamlined procedures for check-in and check-out), the benefits are maximised in new hotels where, for example, bedrooms are all of a similar size and shape (Exhibit 4).

  Since the age of the building itself affects productivity, it follows that UK chains are, on average, less productive than their US or French counterparts. However, where our work allowed us to compare chains on a complete like for like basis, differences in productivity levels were not material.

¶ **Service mix.** Although somewhat less important than age and chain penetration, differences in service mix across the three countries at both the macro (i.e., key departments) and micro (i.e., services provided within key departments) levels also contribute to the productivity gap.

- *Macro level:* Hotel revenue typically comes from three main sources:

  – 'Accommodation' through room rates – this typically represents at least 50 to 70 per cent of hotel revenues.

  – 'Food and beverage' through restaurants, bars and room service – this can account for up to about 40 per cent of revenues, depending on the levels of service provided.

  – 'Other services' such as sports and business facilities – these generally represent less than 10 per cent of the total revenue stream.

  Given its relative size, we have not investigated cross-country differences in 'other services.' However, our research shows that food and beverage services have inherently lower labour productivity than accommodation services, and that provision of these services is significantly higher in the UK than in the US or France (Exhibit 5).

- *Micro level:* There are also differences in service levels at the micro level between French hotels and UK/US hotels. French hotels are less likely to offer services such as porterage, and more likely to invest in equipment to help guests to help themselves in areas from buffet meals through to shoe cleaning. As a result, and in a similar way to that observed in French supermarkets in our food retailing case study, French labour productivity is boosted relative to the UK and US.

¶ **Size of hotels.** Individual establishments gain some economies of scale from reduced labour inputs per room as the number of rooms in a hotel rises. Hotels with fewer than about 20 rooms are likely to have significant diseconomies of scale if operated on a full commercial basis, and are the most likely to be supported by unpaid family labour. For larger hotels, the hours worked per room cleaned do not vary substantially, but there will be economies in nearly all other areas of operation.

The low incidence of small hotels and the high incidence of very large hotels in the US therefore yields modest further productivity gains for the US relative to the UK (Exhibit 6).

¶ **Non-differentiating factors – labour skills.** In interviews, hotel operators – especially in small businesses – repeatedly reported difficulties in recruiting and retaining skilled staff in the UK. Their concerns covered a range of skills that centred on customer care, food preparation and service and management. Tipping practices in the US were also often mentioned as making it easier to motivate front of house staff relative to the UK.

However, we did not observe any significant productivity gap between like-for-like hotels operated by the same international chains across countries, suggesting that with effective training and well designed functions and tasks, differences in entry-level skills can be overcome. We do not believe, therefore, that there is any significant inherent difference in the trainability of the hotel workforce across the three countries, although it would appear that the higher level of small independent hotels in the UK could be limiting the extent to which these skills are being developed.

Industry dynamics and external factors

A consequence of low chain penetration is that most UK operators have faced limited competition with international best practice - only about 3 per cent of UK hotel rooms are in major international chains (Exhibit 7). Levels of competitive intensity in the UK may also be inhibited by the historic lack of a widely used grading system, particularly relative to France.

To understand why the UK has more old hotels and fewer chains than the US or France, we analysed the economics of operating both old and new hotels in each of the three countries. In particular, we tried to understand why old hotels in the UK have not been replaced with modern formats, whether newly built or refurbished. Older stock dominates in the UK because high construction costs – driven by both stricter building and planning regulations and a weaker performing domestic construction industry – make it uneconomic for old stock to be renovated and/or to exit the market, and the UK has had less demand growth that would allow new hotels to dilute and displace the old stock. Construction costs primarily influence differences between the US and the UK, whereas demand growth explains differences with both France and the US.

¶ **Construction costs are higher in the UK than in the US:** US construction costs are about 70 per cent of those in the UK. UK construction costs are higher for two main reasons (Exhibit 8):

- *Product market regulations:* There are two types of regulation that impact UK performance: building regulations, and planning and listing regulations:

– *More prescriptive building regulations:* Construction costs in the UK are driven up because hotel operators must follow myriad regulations, such as health and safety and fire regulations. One report on hotel construction by Pannell Kerr Forster[1] (PKF) commented that regulations "have become increasingly specific and therefore more restrictive and potentially more expensive". Experts estimate that the UK's more prescriptive building regulations explain around one third of the difference between UK and US construction costs.

– *More stringent planning and listing regulations:* UK planning and listing requirements often impose higher cost design and construction methods. In some cases planning restrictions actually prevent new hotels from being built.

  . Anecdotal evidence suggests that planning requirements in the UK are highly prescriptive, and make it hard to build or refurbish. For example, the PKF report comments: "The effect on building type and design arising from planning control can be considerable. Current powers allow local authorities to state preferences for size of development, layout and materials to be used, particularly where they influence the appearance of the building". In some cases planning restrictions prevent hotel operators from accessing the best sites on which to build new hotels, further discouraging entry by best practice operators.

  . In addition listing requirements often impose inefficient working practices on hotels. One hotel operator told us that he was prevented from knocking down any walls in the building, had to retain skirting boards, cupboards and doorknobs, and could not cut down tree branches to make his hotel sign more visible. Around, 3,000 hotels in the UK are in listed buildings.

Depending on the specific situation, experts indicate that planning and listing regulations account for between 15 and 50 per cent of the difference between UK and US construction costs.

Poor performance of construction industry and poor building design by hoteliers: The UK construction industry is widely regarded as being inefficient, with fundamental issues of reliability and quality. Additionally, the industry does not make use of many of the cost effective building methods used in the US, such as pre-fabrication. (See Box 1 for a more detailed discussion on the construction industry.)

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[1] "Hotel design and construction in the UK" Panel Kerr Forster, 1998.

At the same time, UK hotel operators are typically less adept than US operators at providing easy-to-follow specifications, which inhibits the construction industry from fully standardising their practices. Depending on the specific situation, experts indicate that the inefficient construction industry and poor building design explain between 15 and 50 per cent of the difference between UK and US construction costs.

The relatively high construction costs in the UK affect the age of hotel stock in two ways:

- *Operators are less likely to refurbish their hotels in the UK than in the US:* The high cost of construction in the UK means that the breakeven point for undertaking refurbishment is higher than it is in the US, thereby making UK operators less likely to modernise their hotel. For example, in one case study we found that the owner of an old hotel was unlikely to recover the costs of refurbishment to modern format in any of the three countries studied. However, the loss in value through refurbishing rather than maintaining the status quo was significantly less in the US because lower construction costs meant that smaller increases in yield per room were needed to compensate for the renovations (Exhibit 9).

- *New hotels are less likely to be built in the UK than in the US:* High construction costs in the UK also mean that the breakeven occupancy level for new build hotels is higher in the UK than in the US - in another case study we found that a new US hotel could break even at roughly 50 per cent occupancy, whereas the equivalent figure for the UK was closer to 80 per cent (Exhibit 10). As a result, unless they can be assured of high levels of occupancy, new hotels are less likely to be built in the UK than in the US. This is particularly important in areas of fixed demand where there is already an existing operator, because it makes it less likely that a new entrant in the UK will be able either to co-exist with the existing operator or to drive the existing operator out of business. In addition, planning restrictions limit access to many sites that offer the greatest potential to achieve high occupancy rates, further restricting new build.

¶ **Relative lack of demand growth inhibits the creation of new hotels in the UK**: Given the disincentives in the UK to renovate and displace old stock with new stock, the proportion of new stock can only rise if old stock is retired or if new stock is supported by new demand. Old hotels are unlikely to exit the market for alternative uses, and the UK has experienced less growth in demand than either the US or France.

- *Old hotels are less likely to have exited the market through sale for alternative use in the UK:* The structure of a hotel building is such that it has limited alternative use (rare examples include conversion to residential dwellings or nursing homes). Thus, other than in the few cases where there is clear demand for a permitted alternative use, the value of the structure is generally simply the value of the land, and it is often more economic to keep the relatively unproductive old stock open. In general, therefore, old hotels exit a market only relatively slowly. Given the UK's planning environment, this process is made even more slow.

- *The UK's smaller proportion of new build is therefore partly a reflection of lower growth in demand for hotels in the post-War period:* Estimates based on population growth, income growth, proportion of service businesses in the economy (which are all external macroeconomic factors) and net inflows of international travel suggest that the UK has experienced domestic demand growth of only around half US levels and half or even less of French levels in the post-War period (Exhibit 11).

  Low net inflows of international travel may be partly attributable to country-specific factors, such as the UK's geography and climate (compare France with its popular ski resorts in the winter and Mediterranean beaches in the summer), but there also appears to have been less demand stimulation by the tourist industry as a whole as measured by the growth in the number of major new attractions developed in each of the countries over the past 40 to 50 years (Exhibit 12). Only one of the top 10 tourist attractions in the UK was built in the 20th century, compared to six in France and nine in the US. In fact, over the past two decades, France has built five of its top 10 destinations, the US has built three of its top 10, while the UK has built none.

Although less important than high construction costs, we examined a number of other external factors to explain the UK hotel sector's low labour productivity.

¶ **Historic performance of restaurant sector.** There is insufficient information to draw firm conclusions as to why UK hotels offer more food and beverage services than the US or France, but it may reflect historic weaknesses in the UK's restaurant sector, together with the higher proportion of older stock. A hotel operator will build a restaurant if the increased revenue, both direct from the restaurant and as a result of higher room rates and occupancy, justifies it. This is more likely to be the case if guests cannot be sure of finding meals of adequate quality and value at a nearby location. A quick examination of the restaurant sector in six small provincial towns across the three countries suggests that there are large differences in the quantity of independent restaurant services provided, lending some support to the suggestion that UK hotel operators have historically found it more difficult to rely on food provided outside the hotel (Exhibit 13).

In terms of labour productivity within the economy as a whole, a shift in provision of food services from hotels to independent restaurants would benefit the UK so long as independent restaurants are more productive than those based in hotels. While we have not carried out any analysis to prove this hypothesis, it seems likely that companies focused on restaurant operations would be more productive in providing these specific services than those with a wider range of activities. This argument is supported both anecdotally by leisure sector operators, and by the current trend to outsource hotel restaurant operations.

¶ **Labour costs.** Differences in service mix at the micro level are explained by the relatively high cost of labour in France that has forced operators to restrict the range of services they provide within a given hotel format.

¶ **Planning regulations.** The larger scale of US hotels is related to planning regulations, which in addition to raising construction costs, also make it more difficult to obtain permission to build large hotels in the UK.

¶ **Non differentiating factors – access to capital.** There has clearly been less investment in recent years in the hotel industry in the UK than in France or the US. However, as explained above, we believe that this reflects rational decision making by both managers and capital markets. We found no evidence to suggest that hotel operators in the UK find it harder to access capital given a certain level of return than operators in the other countries studied.

FUTURE OUTLOOK AND RECOMMENDATIONS

There is significant room for improvement in the UK hotel industry. Not only does the sector suffer from poor labour productivity, output is also low. Output per capita in France is 25 per cent greater than the UK, and output is more than twice as high in the US. There are a number of actions the Government and the hotel industry can take to attempt to tackle both of these gaps.

Difficulties in obtaining hard data on individual segments of the hotel market has meant that the reasons given for poor productivity have focused on the sector as a whole. However, in terms of future outlook and recommendations for the industry, specific segments of the market provide a better basis for implementing solutions. Hence, in addition to detailing recommendations relevant for the whole sector, we outline specific recommendations for three key segments: London, provincial tourist destinations and non-London business destinations.

The overarching message in all sectors is the same – the UK needs to encourage the creation of modern, productive hotels and encourage the economic reduction of old, less productive stock. Promoting the construction of new hotels in new destinations is a key to diluting the average age of the UK hotel stock. This will require a combination of the tourist industry working to stimulate demand and Government policies that lower the cost of construction. Because of the lack of exposure to best practices and the difficulty of new entry, UK hotels have been somewhat protected, and, furthermore, may not have felt the competitive pressure to aggressively market themselves to stimulate demand.

We believe that these actions should help boost productivity and output significantly, although they are unlikely to close the gap fully. Lower income levels and country specific factors such as poor weather and geographic factors such as size of the country will clearly limit what can ultimately be achieved (Exhibit 14).

General sector outlook and recommendations

The global tourist industry is projected to grow prodigiously over the next 20 years, and the UK will certainly benefit from that growth. However, if there is no improvement in the hotel industry, it is likely that the UK will slide down the world rankings of tourist and business service destinations. There will be some improvement of the industry as chains continue slowly to penetrate the market, for example the current trend by companies like Whitbread to open chained budget inns across the country. However, this will not be enough for the industry to achieve its full potential.

To further improve productivity in the industry, hoteliers must therefore attempt to stimulate demand and aim to realise the benefits of a single, country-wide grading system.

¶ **Stimulate demand within the industry:** The industry itself could go some way to improving productivity within the existing stock by developing more sophisticated marketing techniques to stimulate demand (e.g., cross-sectoral alliances, loyalty schemes). These programmes are much more prevalent in the more competitive US and French hotel markets, and they help to build customer loyalty and increase visits. In the leisure sector, demand may be stimulated by offers such as weekend breaks and external health club memberships; in the business market it would involve investing in more facilities and services to host business events.

¶ **Realise the benefits of a single grading system:** The industry should closely monitor the introduction of the new unified standards for accommodation in England, and take steps to improve their uptake and efficacy as necessary. A ratings system does not mean that there has to be a set of 'minimum' standards that all hotels must meet. It simply ensures that consumers understand exactly what they are getting when they decide to stay in a hotel.

The hotel industry itself can go a long way to improving productivity, but if the Government does not help change the terms of the game, productivity boosts will be seriously constrained. The Government needs to evaluate the impact of the planning and listing regulations, as well as continue to aid efforts to improve the construction sector and the skills of incoming workers.

¶ **Consider the impact of planning and listing regulations**: As a minimum, the Government should ensure that the current review of the planning system leads to faster decision making and greater certainty of outcome. In addition, the Government should ensure that planning decision makers are aware of the economic implications of their decisions. The current thinking behind planning policies in the hotel industry serves to protect inefficient, old stock, for which consumers are unwilling to pay the additional costs implied. In addition, the hotel industry is protected from competitive pressure and best practice operators, which has likely led to less demand stimulation.

¶ **Continue to support efforts to improve the construction sector:** Government should actively support the current efforts being made to improve the performance of the construction sector. These are important not only for the hotels sector, but for all industries looking to develop new formats (e.g., retailing, leisure complexes) and so are key to the economy as a whole.

London outlook and recommendations

The London hotel market suffers from significant under-capacity, particularly in the budget sector, driven by extremely restrictive planning and listing regulations, in addition to poor infrastructure. Without changes to regulation, there is unlikely to be any significant improvement. Government must therefore look to find socially acceptable ways to loosen these regulations and encourage new hotels.

¶ **Without change, undercapacity will continue:** Occupancy rates in London are significantly higher than the rest of the country, and are also higher than other major European cities. In recent boom times, as demand has increased and supply has remained fixed, hotel operators have been increasing prices. It appears unlikely that future demand will be met.

- In 1995, the London Tourist Board set a goal of 10,000 new hotel rooms in London by 2000, and said it thought 20,000 would be needed. While there has been some progress in meeting these targets, it still appears that there will be a significant shortfall (Exhibit 15). Almost 8,000 rooms have either been built or are under construction, with about 7,000 rooms considered "probable." Even if all of the probable rooms are built, the 5,000 room short-fall represents roughly 5 per cent of total London hotel stock, so that there still will be under-capacity.

- London is not considered an attractive market by international hotel chains thinking of expanding. When 11 international chains were asked where they were looking to build additional rooms in Europe over the next few years, London was placed eighth, behind cities such as Dublin and Berlin (Exhibit 16).

¶ **Planning and building restrictions prevent new hotels**: The Unitary Development Plan for Kensington and Chelsea, for example, makes no provision for hotels, making the outcome of applications less certain and more likely to fail; over 30 per cent of Westminster is declared a Conservation Area, substantially restricting opportunities for new hotels and refurbishment. Even in Earls Court, where many commentators agree the current stock of hotels is of very poor quality, residents will not allow new hotels to drive out old stock.

¶ **The Government needs to consider the potential negative impact of no change**: Visitors to London are currently more likely to report being unhappy with their hotels than visitors to the rest of the UK. If action is not taken to meet consumer demand, the problems are likely to get worse.

Tourist destinations outlook and recommendations

The UK's record in developing new leisure attractions has been relatively poor – only one of the top 10 tourist destinations in the UK has been built in the past 50 years (Alton Towers). Again, experts point primarily to the role of restrictive planning and poor infrastructure. Several experts said it would be next to impossible to get planning permission to build a site the size of EuroDisney – especially because poor infrastructure effectively limits the number of sites that can support such parks. Another example of the difficulty obtaining planning permission is demonstrated by the ongoing legal battle that The Rank Group has faced in creating its Oasis holiday village in Kent.

Tourist destinations can be a boon to both output and employment, and the Government needs to balance these goals with the goal of protecting the environment. At the same time, there are actions hotel operators can take to help create and improve tourist destinations:

- **Increase intermediation to better target existing tourist spots:** There are still many areas in the UK that could serve as "destinations" with increased intermediation. A focus on these areas by companies such as travel agents and tour operators, as has happened in a number of foreign holiday destinations, would help to increase demand and hence the need for more hotels. In addition, a unified rating system could eliminate variable quality and also increase demand.
- **Act with other providers to help create demand:** Hotel operators need to act in alliance with other leisure/travel providers to create new destinations such as leisure complexes and theme parks. CenterParcs is an example of a new format that could serve as a tourist magnet.

Non-London business outlook and recommendations

The UK currently houses only 4 per cent of total European conference and exhibition space compared to 17 per cent apiece for France and Italy and 38 per cent for Germany (Exhibit 17). This suggests that there is considerable potential for growth in this area. Exhibition space can be an enormous boon to hotel operators, as it draws in large groups of people who need hotel accommodation.

In looking to boost UK exhibition space there needs to be an integrated effort from hotel operators working with Government and other public and private sector bodies to enhance and develop the UK's reputation as a conference destination.

Appendix: Methodology for productivity calculations

To compare the performance of the UK hotels sector with that of other countries we investigated output, labour inputs, and labour productivity.

¶ **Output**: Output was defined as value added per capita for the hotel sector as provided in each country's national statistics. This was converted to a common currency using a PPP constructed in three stages:

- An accommodation only PPP was established by matching room rates of a sample of pairs of hotels offering similar services across the three countries.
- Given that the OECD PPP for the 'hotels and restaurant' sector is made up predominantly from restaurants, we took this number to represent a PPP for food and beverage services provided within the hotel sector.
- We then aggregated the accommodation PPP with the food and beverage PPP, in the ratio of estimated revenues earned from accommodation and food and beverage services respectively to provide an overall hotels sector PPP.

¶ **Labour inputs**: Labour inputs were defined as number of hours worked in the sector in each country taking into account the proportion of part time workers, self employed, length of working week and annual leave. Anecdotal evidence suggests that labour inputs may be undercounted in France and, to a lesser extent, the UK, relative to the US. If this is the case, the true productivity gap between the France and the UK is less than that described, but the gap between the US and the UK is slightly higher.

¶ **Labour productivity**: Output divided by labour inputs.

Box 1

UK CONSTRUCTION INDUSTRY

While we have not studied the construction industry in detail, expert interviews suggest that the industry is performing relatively poorly compared to the US. This view was supported by an independent report by Sir Michael Latham in 1994 which suggested the industry could increase its productivity by about 30 per cent, and proposed the formation of a "Construction Task Force," which was subsequently chaired by Sir John Egan.

The task force released its preliminary findings in February 1998, suggesting that there is widespread room for productivity improvements, of the order of 10 per cent a year. The task force said: "The construction process, particularly when viewed as a whole, is inefficient in the use of labour and prone to waste." It went on to state that the industry should look to achieve

50 per cent reduction in defects on handover every year

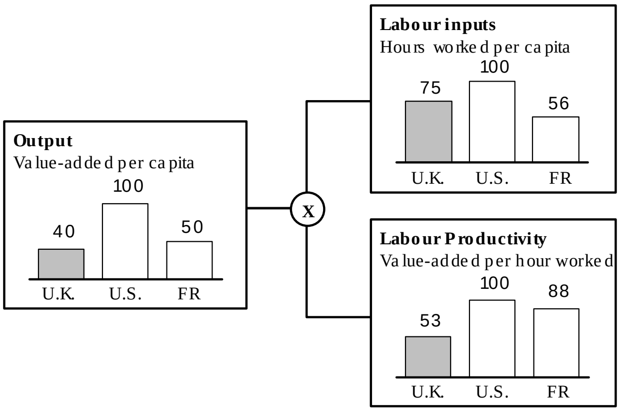
50 per cent reduction in construction time within five years

80 per cent reduction in accidents within three years.

Exhibit 1

HOTEL SECTOR LABOUR PRODUCTIVITY*, 1996

Output per hour worked; Indexed to U.S. = 100



* Converted at constructed PPP

Source: National Accounts; EIU; WTO; McKinsey analysis

Exhibit 2

CAUSALITY FOR PRODUCTIVITY DIFFERENCES

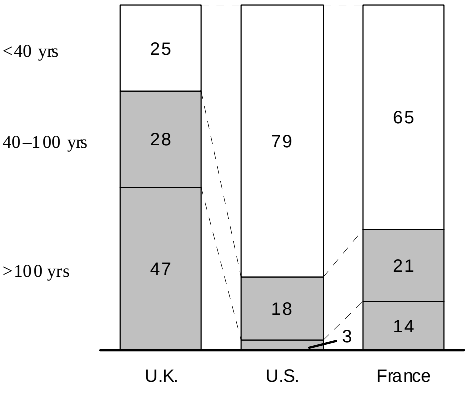
● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

		U.K. vs. U.S.	U.K. vs. FR
External factors	• Fiscal and macroeconomic environments	○	○
	• Product market		
	– Trade/FDI barriers	-	-
	– Product regulations	●	●
	• Labour market		
	– Labour rules/unionism	-	-
	– Relative labour cost	-	○
	– Education	-	-
	• Capital market		
	– Corporate governance/government ownership	-	-
	– Access to capital	-	-
	• Other external factors		
	– Other industries /up and down stream	●	○
	– Country specific factors	○	○
Industry dynamics	• Competition with best practice	●	●
	• Domestic competitive intensity	-	-
Production process	• Mix of products and services/marketing		
	– Product category mix	○	○
	– Value added within category mix	-	-
	– Product proliferation	-	-
	– Pricing structure/marketing	-	-
	• Production factors		
	– Capital intensity/technology	●	●
	– Scale	○	-
	– Front line skills/trainability	-	-
	– Matching capacity to demand	-	-
	• Operations		
	– Organisation of functions and tasks	●	●
	– Design for manufacturing	●	●
	– Suppliers and supplier relationships	-	-
	Productivity performance (comparison country = 100)	53	60

Exhibit 3

AGE OF HOTEL BUILDING

% by rooms

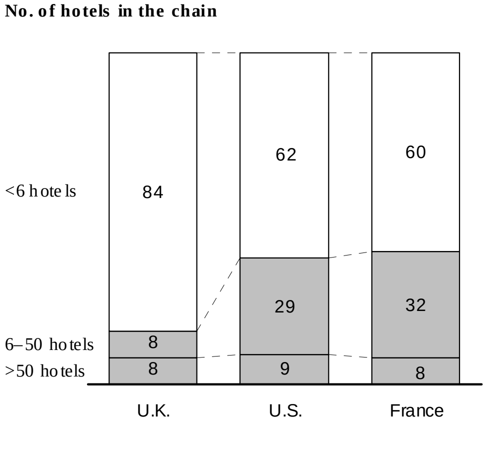


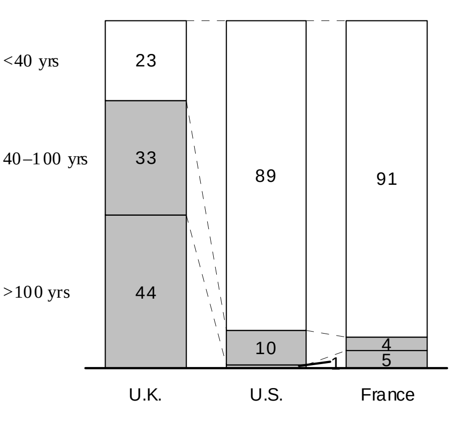
Source: McKinsey survey

Exhibit 4

CHAIN HOTELS

% by room



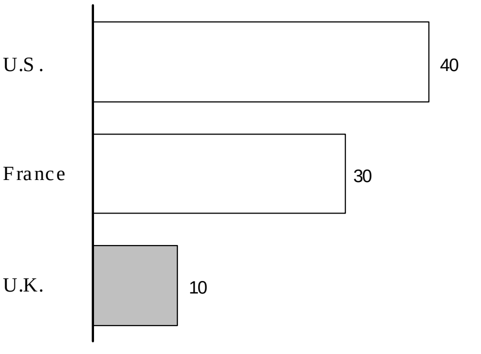


Source: McKinsey survey

Exhibit 5

HOTELS WITHOUT A RESTAURANT

% by rooms

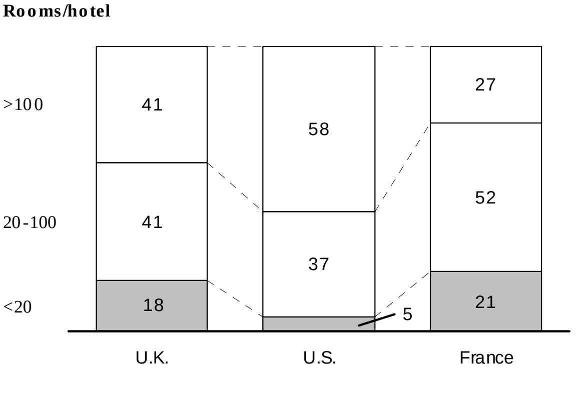


Source: McKinsey survey

Exhibit 6

SCALE OF HOTELS

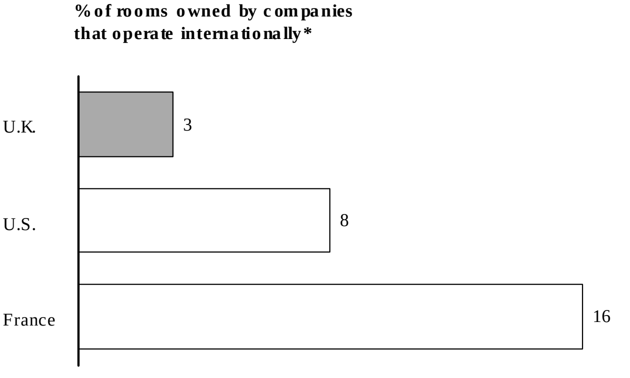
% by rooms



Source: McKinsey survey

Exhibit 7

NATURE OF COMPETITION

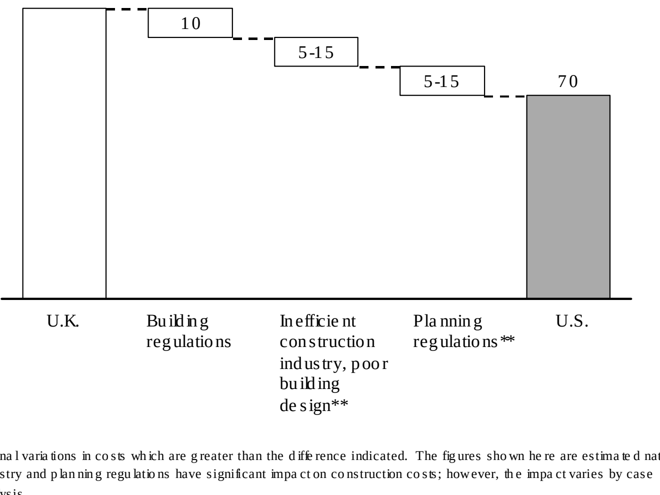


* Defined as having more than 5% of the rooms in the quoted market in one of the other countries in the study

Source: Kleinwort Benson; McKinsey analysis

Exhibit 8

ESTIMATED DIFFERENCES IN CONSTRUCTION COSTS*



* Both countries show regional variations in costs which are greater than the difference indicated. The figures shown here are estimated national averages

** Both the construction industry and planning regulations have significant impact on construction costs; however, the impact varies by case

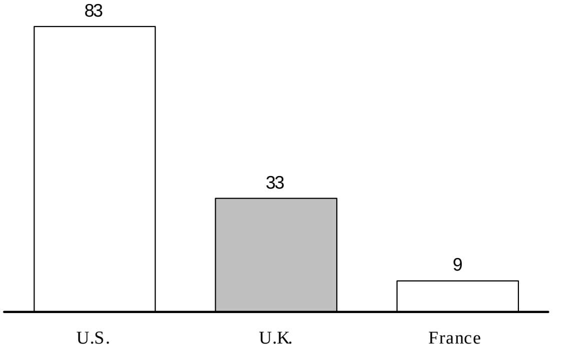
Source: Interviews; McKinsey analysis

Exhibit 9

VALUE OF REFURBISHED HOTEL*

EXAMPLE

Indexed to value without refurbishment = 100



* Assumes 50% increase in yield/room as a result of refurbishment to modern format

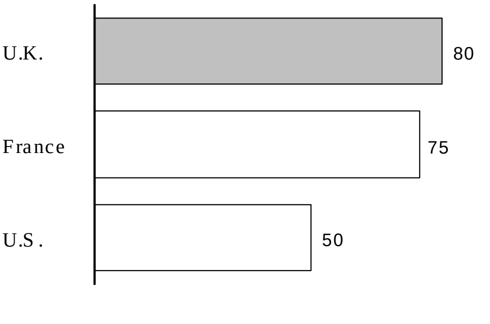
Source: McKinsey survey; interviews; McKinsey analysis

Exhibit 10

ESTIMATED BREAK-EVEN OCCUPANCY FOR NEW HOTEL*

EXAMPLE

%



* Based on mid market hotel

Source: McKinsey analysis

Exhibit 11

DEMAND DRIVERS

ESTIMATE

Source: ONS; U.K. Tourism Survey; British National Travel Survey; Statistical Abstract of the U.S.; Direction du Tourisme; McKinsey analysis

Exhibit 12

TOP TOURIST ATTRACTIONS, U.K., U.S., AND FRANCE

Yearly attendance, m

U.K.

Name	Const. Date	Attend. (m)
Blackpool Pleasure Beach	1896	7.5
British Museum	1847	6.2
National Gallery	1838	5.0
Palace Pier	1899	4.3
Alton Towers	1970s	2.7
Madame Tussauds	1884	2.7
Tower of London	1100 (1660)	2.5
Westminster Abbey	1200 (1700)	2.5
York Minster	1220	2.5
Eastbourne Pier	1882	2.3

FRANCE

Name	Const. Date	Attend. (m)
EuroDisney	1992	11.7
Tour Eiffel	1889	5.5
Musée du Louvre	1500 (1793)	5.0
Cité de Sciences	1986	3.9
Versailles	1600s (1837)	2.9
Parc Futuroscope	1987	2.8
Parc Aquaboulevard	1984	2.2
Musée d'Orsay	1900 (1837)	2.1
Parc Astérix	1989	1.7
Parc Marineland	1970	1.2

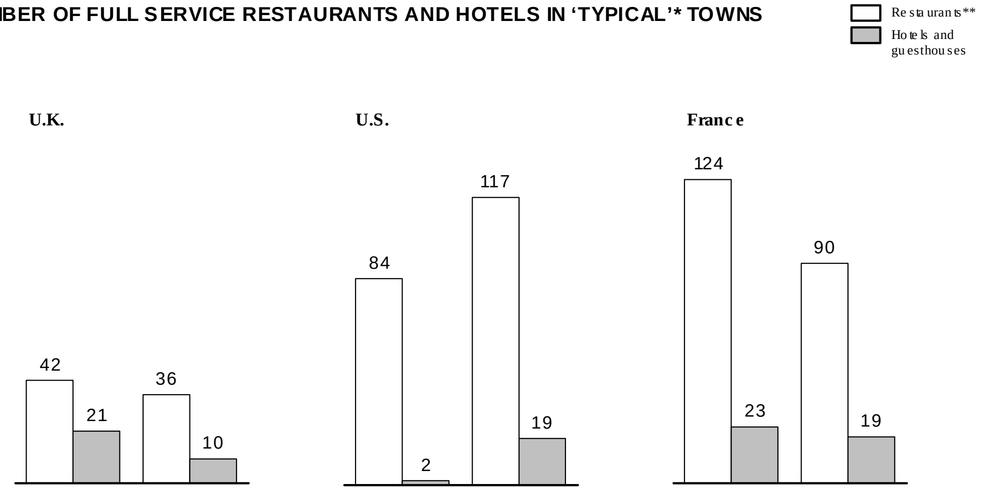
U.S.

Name	Const. Date	Attend. (m)
Disneyland	1955	14.1
Magic Kingdom, FL	1971	12.9
Epcot Center	1982	10.7
Disney Studies, FL	1989	9.5
Universal Studios, FL	1990	8.0
Sea World, FL	1973	5.0
Universal Studios, CA	1964	4.7
Statue of Liberty	1886	4.2
Six Flags, NJ	1974	4.0
Busch Gardens, FL	1959	3.8

Source: Literature searches, company representatives; Memento du tourisme 1997/98; BTA; McKinsey analysis

Exhibit 13

NUMBER OF FULL SERVICE RESTAURANTS AND HOTELS IN ‘TYPICAL’* TOWNS



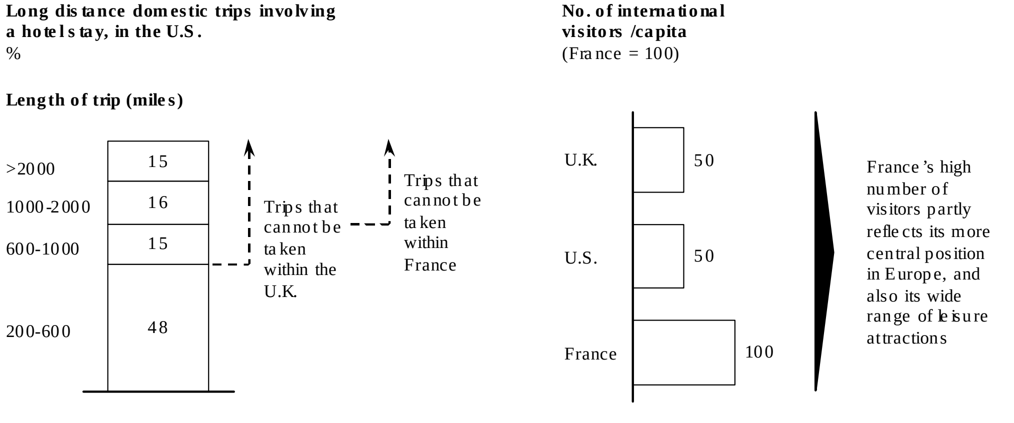
* Population 60,000; no major leisure or business attractions

** Excludes bars and fast food outlets as they are unlikely to be able to provide food services consistent with the hotel guests’ requirements. Excludes outlets defined as pubs in the U.K. because, historically, they are unlikely to have provided significant amounts of food service

Source: Yellow Pages; Tourist Boards; Phone Disc, 1998; McKinsey analysis

Exhibit 14

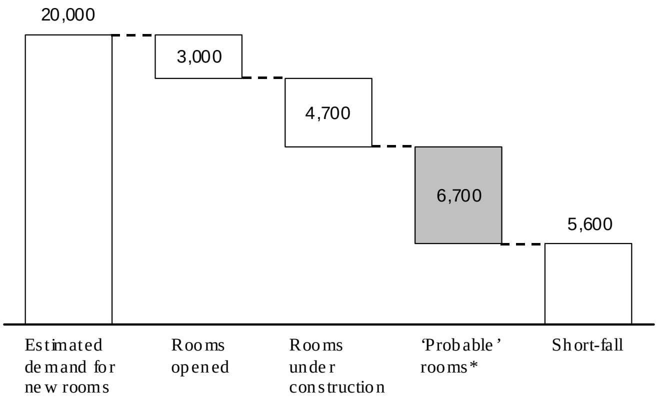
GEOGRAPHICAL CONSTRAINTS



Source: WTO; BTA; Rushmore

Exhibit 15

ESTIMATED NUMBER OF NEW HOTEL ROOMS IN LONDON BY 2000



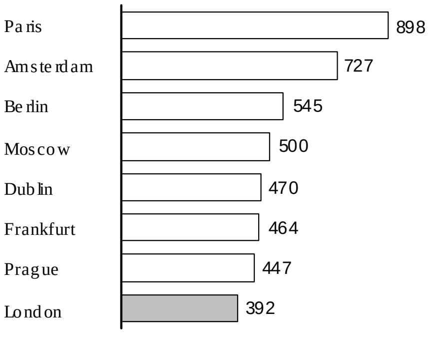
* Rooms that either have full or outline planning permission

Source: London Tourist Board, Hotel Development Log; McKinsey analysis

Exhibit 16

PROPOSED ADDITIONS BY MAJOR INTERNATIONAL CHAINS*

No. of rooms

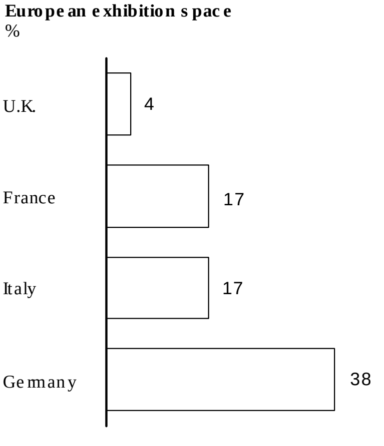


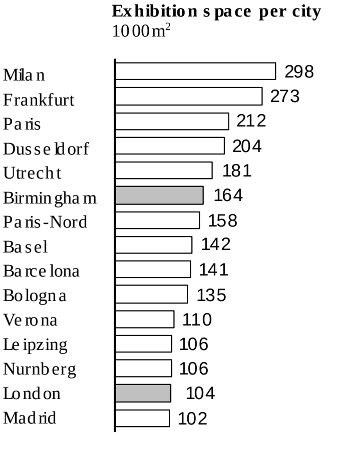
* Based on a survey of 11 international brands (Four Seasons, Hilton, Holiday Inn, Hyatt, Inter-Continental, Marriott, Le Meridien/Forte, Radisson, Sheraton, Sol Melia, Westin)

Source: Christie Consulting International; McKinsey analysis

Exhibit 17

CONFERENCE AND EXHIBITION MARKET





Source: Deloitte and Touche; Press reports; European Major Exhibition Centres Association; McKinsey analysis

Telecommunications

EXECUTIVE SUMMARY

The telecommunications industry is currently undergoing radical change as developments in technology, privatisation of incumbent operators and major deregulation across the world take effect.

UK total factor productivity performance in the telecommunications industry is around 60 per cent of US levels, primarily as a result of much lower usage (i.e., minutes per capita) of the network. While part of this difference reflects the gap in income levels (i.e., GDP per capita) between the US and UK, it can also be traced to a history of different pricing structures and stronger marketing by US companies.

In the US a long history of free local calls and active demand stimulating product promotion has led to different demand behaviour. Even before deregulation, capital market pressure and regulations designed to make calling rates cheap created incentives for US operators to stimulate demand. By contrast, regulations in the UK prior to deregulation focused on low subscription charges subsidised by high calling rates, with no incentives for increasing usage; regulations since then have limited the speed at which rebalancing of these subsidies has been able to take place, and have also, at least until recently, failed to promote the rapid development of a competitive environment that would encourage the development of innovative products. Over the long term these differences have led to a US call volume per capita of nearly three times that in the UK. This has created far higher utilisation of the fixed infrastructure in the US and hence led to greater productivity.

Lower performance in the telecommunications industry leads to lost benefits for the economy overall through higher communication prices and lower availability of innovative products that can enhance productivity in other sectors (e.g., call centres, Internet commerce). Going forward, regulators must ensure that they eliminate any remaining distortions in the competitive environment, while operators should look to focus on demand stimulation through continued price reductions, increased marketing activity and the provision of more value added services.

Telecommunications

INTRODUCTION

The telecommunications industry has changed radically over the past 20 years. At the start of the 1980s it was a stable industry dominated by a set of state owned monopolies. Since then a combination of changes in technology, privatisation of incumbent operators and major deregulation have turned telecommunications into a global industry and placed it at the heart of the much discussed digital and multimedia revolution. Future developments in the industry will have profound effects not only on the lives of individuals, but also on how business is conducted and how a host of related industries will evolve. For the UK to capitalise on these changes, its regulatory regime must encourage the UK telecommunications industry to participate actively in this newly developing and competitive environment. This will allow the overall economy to benefit from the impact of new telephony based formats for transacting business, and so potentially place the UK at a significant advantage over its European counterparts.

The telecommunications services industry accounts for around 2 per cent of GDP and 1 per cent of employment in the UK. This study focuses primarily on public wireline services which represent over 80 per cent of UK traffic. We have excluded cellular telephony, private networks, equipment and cable television operation from our analysis primarily because of the difficulty involved in ensuring comparability of these sectors across countries. The comparison countries that we have studied are the US, France, Germany (West and East) and Sweden.

The current regulatory environment for public fixed line services within each of the countries studied is summarised below. Further details are provided in Exhibit 1:

¶ *UK:* Telecommunications services in the UK were provided by the state monopoly until 1984 when BT was privatised and the market was opened to one competing carrier (Mercury). In 1991 many of the remaining controls were removed and the market was further opened to competition in both long distance and local services.

¶ *US:* In 1984 AT&T, which was a privately owned monopoly, was broken up into seven Regional Bell Operating Companies (RBOCs) and one long distance carrier (AT&T). The RBOCs remained as local monopolies while the long distance market was opened up to competition (mainly with MCI and Sprint). The Communications Act of 1996 has laid the ground for full competition in all services.

¶ *France and Germany:* In both France and Germany state owned operators had a monopoly over both local and long distance services until very recently: France Telecom was partially privatised in 1997, Deutsche Telekom in 1996; both countries opened up their markets to competition from 1 January 1998.

¶ *Sweden:* Telia remained a state owned monopoly until 1993, although competition had not been prohibited prior to this. Licences were granted from a regulatory agency first for international, then for long distance, and in 1996 finally for local carriers.

PRODUCTIVITY PERFORMANCE

In 1995 National Economic Research Associates (NERA) undertook a detailed study to benchmark BT's efficiency with a number of other telephone operators. Their work concluded that BT's operational efficiency was around 90 per cent of that of the US RBOCs, considered the worldwide benchmark.

The NERA work was aimed at understanding how well BT was managing its cost base, and as such used a unit cost approach to measuring efficiency. Its results are therefore important in helping to understand how efficiently the network is being *operated*, and suggests that BT is now near to world class in this respect. In our work we are seeking to understand how well labour and capital are being used across an economy and therefore how efficiently the network is being *used* as well as operated. As a result of these differences in objectives, we have taken a different approach from NERA in calculating productivity.

We have defined two separate, physical outputs for the fixed wireline network, namely call minutes and access lines, and from these have developed an 'aggregate output' measure.

There are a number of ways to combine these two outputs into an aggregate output. For example, we could aggregate on the basis of the ratio of costs incurred in providing each of call minutes and access lines. Given that the costs directly associated with the former are very much lower than those directly associated with the latter, this will yield a result heavily weighted in favour of access lines. However, one could also argue that call minutes cannot be made without access lines, so that the output should be based on minutes alone.

We have chosen to combine the outputs based on the ratio of revenues earned from lines and minutes, since this should reflect how consumers value these different services. For the European comparison countries this is the ratio of revenues earned from access (i.e., rental) charges to those earned from call minutes; in the US where local calls are generally unmetered, it is the ratio of revenues earned from access charges (including the opportunity to make local calls) to those earned from long distance calls. Despite these differences in pricing structures, the ratios are reasonably similar across the comparison countries (Exhibit 2). We have therefore used the average ratio of 28/72 for combining the two outputs.

Based on this methodology we calculate the UK's total factor productivity to be around 62 per cent of US levels; Sweden is slightly better at 75 per cent and France and Germany somewhat worse at 49 per cent and 42 per cent respectively (Exhibit 3).

Further details of the methodology used to calculate productivity are provided in the Appendix.

REASONS FOR DIFFERENCES IN PRODUCTIVITY PERFORMANCE

Given that the UK's telecommunications productivity is well above that of France and Germany, we have limited our analysis of the reasons for differences in productivity performance to comparison with the US and Sweden. Exhibit 4 shows the framework with which we have analysed the productivity gap across all the sectors studied. It divides the causes for the productivity gap into three groups. At the lowest level, productivity differences are caused by differences in production processes within firms. These differences are driven, however, by factors external to the firm within both the industry sector and the economy at large.

As many of the costs associated with providing telecommunications services are fixed, productivity is directly affected by differences in usage (i.e., minutes per capita). Usage is about 2.7 times higher in the US than in the UK, and about 1.7 times higher in Sweden than in the UK (Exhibit 5), and it turns out that this explains almost all of the productivity gap with the US and Sweden.

Differences in usage of the magnitude described above have been around since at least the early 1980s (Exhibit 6) and do not seem to be a function of mix by business/residential usage (Exhibit 7). However they do reflect a greater incidence of local calls in the US and Sweden than in the UK (Exhibit 8).

Part of the usage gap with the US can be explained by income levels: telecommunications expenditure is closely correlated with GDP per capita (Exhibit 9), so that greater output in other sectors of the economy in the US has inevitably led to greater demand for telecommunications services. However, this is by no means the whole story and we believe that differences in the way telecommunications companies have behaved have also played a key role in determining usage levels. In particular, we believe that much of the usage gap with the US and Sweden can be explained by differences in long standing price structures and a regulatory environment that has, at least until recently, created less incentive in the UK than in the US and Sweden for telecommunications managers to stimulate usage and develop new services.

Below we detail the differences on the supply side between the comparison countries at the production process level (i.e., those over which managers have some control) and also at the external level (i.e., those that set the environment under which managers operate) to help explain how the usage gap arose.

Production processes

Telecommunications managers in the US and in Sweden have a long history of taking explicit actions to stimulate demand for their services. Consequently telephone usage has become a more accepted and important part of both social and business interactions in these countries. The actions they have taken fall into three main areas:

¶ *Pricing structures and levels.* Historically different long term pricing structures for local calls across the three countries have played the most important role in shaping consumer attitudes towards telephone usage: unmetered or very cheap local calls in the US and Sweden relative to the UK have resulted in consumers in these countries developing a greater propensity to make local calls. This has also affected attitudes towards long distance usage, which have been reinforced by historically cheaper long distance rates, particularly in Sweden:

- UK prices for local calls are falling but have traditionally been very high. In contrast, Swedish local calls have traditionally been very cheap, and in the US, where most RBOCs offer both unlimited local calls and metered local call pricing options, the majority of consumers choose (and have always chosen) the unlimited local call option (Exhibit 10). The high calling rates charged in the UK have, at least relative to the US, been offset by lower access rates (Exhibit 11).
- We believe that calling behaviours are determined far more by calling rates than by access rates. As a result, the availability of unmetered calls in the US, and to a lesser extent cheap calls in Sweden, have been key in shaping consumer behaviour towards local calling over time. For example, in states in the US where the unlimited local call option has been withdrawn (e.g., Illinois since 1989), operators do not experience a significant drop in long term call volumes, suggesting that once established, high usage habits can survive a change to a metered system (Exhibit 12).

- Furthermore, by fostering the habit of telephone usage through local calls, we believe that both the US and Sweden may well have benefited from important spillover effects on long distance calls. These effects have been reinforced by the historically relatively low rates that have been charged for long distance calls, particularly in Sweden (Exhibit 13). (Note however that UK national calling rates are now relatively low).

¶ *Marketing/demand stimulation.* A stronger emphasis on marketing and demand stimulating products, together with the pervasiveness of telephone based services, particularly in the US, has also contributed to higher usage in the US and Sweden.

- A traditionally stronger emphasis on marketing in the US and Sweden has helped to counteract the effect of price misperceptions (Exhibit 14).
  - BT surveys show that consumers consistently overestimate the price of calls by a factor of 3-5, and that consumer price perceptions are more important than actual prices in determining demand.
  - A history of heavy advertising - much of which has been focused on price - together with itemised billing has helped to minimise the effect of price misperceptions in the US. Similarly, Telia’s high advertising expenditure and focus on promoting itself as the cheapest telecommunications service in the world has helped position the telephone as a cheap form of communication in Sweden.
  - By contrast, it is only relatively recently that BT has started to market prices heavily. Indeed before standardised itemised billing was introduced in 1995, many UK consumers’ main reference point for pricing calls was their experience of feeding coins into public payphones, which charge significantly higher rates than residential phones.
- US and Swedish operators have been more proactive in stimulating demand through the early introduction of new value added services (Exhibits 15-16).
- Perhaps encouraged by call affordability, businesses have turned more to telephone based services in the US, and may in turn have contributed to high usage by establishing the habit of using the telephone to obtain services.

– The number of business lines per employee is 45 per cent higher in the US than in the UK, suggesting a more intense use of telephones by businesses (Exhibit 17).

– Free phone numbers are much more prevalent in the US than in the UK - estimates suggest that free phone calls account for around 40 per cent of AT&T's total traffic (Exhibit 18). In addition, US businesses themselves in effect promote telephone usage when they heavily advertise their 1-800 numbers.

¶ *Historic penetration levels.* Finally, earlier penetration of fixed telephony in both the US and Sweden than in the UK suggests that these countries' telephone usage patterns may be more mature (Exhibit 19).

Industry dynamics and external factors

The significant differences in usage between the UK and the US and Sweden existed at least as far back as the early 1980s when all the countries surveyed still had monopolies. This suggests that competitive forces were not the original differentiators of productivity performance and that the subsequent advent of competition has not yet changed the picture.

In fact we believe that the key to explaining variations in managerial behaviour and hence productivity is the difference in models of corporate governance and regulation during the monopoly era, together with the way in which competition has been regulated in the UK since then.

¶ *Monopoly era:* As a private company, AT&T's main objective has always been to increase shareholder value. During the monopoly era this objective had to be realised under rate of return regulation and strict price monitoring. Given a fixed rate of return, the primary lever for AT&T to increase value was to increase its invested capital base. To justify higher capital spending to the regulators AT&T then needed to stimulate demand. This is illustrated by the US local call pricing structure. Moreover, since the break up of AT&T, the RBOCs (which remained as local monopolies) continued to focus on demand stimulation by introducing and marketing value added services. Given a pricing structure that does not generate incremental revenue for increased local usage, charging a fixed fee for these services has been a key mechanism for them to raise revenues. Development of these services may also have been helped by the high levels of competitive intensity across other sectors of the US economy that have stimulated demand for these types of service.

In Sweden, and the UK, the monopolist telecommunications company was owned by the government. However, in Sweden a political focus on modern infrastructure and widespread availability and affordability of telecommunications served to keep prices low and promote penetration. Meanwhile in the UK managers were required to stick to a pricing structure built around cheap network access subsidised by high priced calling rates. Consequently there was little incentive for BT managers to decrease prices or increase usage, and while this policy was pursued for legitimate social reasons, it significantly constrained output.

¶ *Competitive era:* The regulatory environment created when the UK opened up to competition has not, at least until recently, been particularly effective at promoting the rapid development of competitive intensity (Exhibit 20). Additionally, although pricing regulations over this period have led to significant falls in calling charges, they have also prevented BT from fully rebalancing and so have limited the rate at which these charges could have been even further reduced.

- *1984-1992: Duopoly*. The privatisation of BT divorced regulation from ownership and made shareholder value a specific objective of the company. At the same time, one competing carrier (Mercury) was allowed to enter the market, and a strict price capping regime was introduced. This regime required BT to reduce the costs of a basket of telephone services by a set percentage each year (the so called 'RPI-X' formula) and, at the same time, placed a cap on the rate at which BT could increase access charges. While this latter point was put in place for legitimate social reasons, it has limited the rate at which BT could rebalance i.e., cease subsidising access charges with calling charges, and so has effectively limited the rate at which BT could reduce call charges to help change user habits.

  Additionally, a number of key regulations during this period (e.g., unequal access, lack of number portability) significantly favoured BT over the new entrant so that by 1992 BT still maintained 93 per cent market share. By limiting competitive intensity, these regulations provided reduced stimulus for BT to focus on demand stimulation.

- *1992-today: Open competition.* After the duopoly review, the regulatory environment moved to open up the market for other new entrants, with a specific focus on infrastructure (as opposed to retailing) competition. Indeed the UK now has one of the most open telecommunications markets in the world in terms of local loop operations. During this period a number of new entrants emerged - most notably the cable television companies - and although barriers remain, the regulatory environment has become more favourable for these players. Additionally, in 1995 the price restrictions on access charges were removed.

In response to these changes competitive intensity has increased, albeit still somewhat slowly, so that by 1996 BT's share had fallen to 84 per cent. At the same time, BT has developed a strong marketing programme focused on improving price perception and explicitly promoting usage. This has resulted in a 25 per cent increase in residential calling over the past four years (Exhibit 21).

FUTURE OUTLOOK AND RECOMMENDATIONS

As the telecommunications industry continues to globalise and deregulate, data transfer is likely to become more important than voice transfer, and new forms of technology such as cable, mobile and fixed wireless will change the way in which information transfer is effected. These developments will have profound effects on how business is conducted: we are already witnessing significant opportunities for other sectors of the economy to benefit from new telecommunications technologies, such as direct sales in the financial services industry and Internet based commerce in the retailing sector.

As this process evolves and telecommunications technologies start to merge with technologies from other sectors (e.g., digital television, Internet etc), boundaries will blur and the telecommunications sector will become more and more difficult to define. As a result, our analysis of productivity, which focuses on voice transfer via public wireline services, will rapidly become redundant. However, the study does provide a number of important insights into shaping the wider electronic communications industry in the future, and in ensuring that the UK economy as a whole can benefit from the industry evolution.

Importance of telecommunications industry to other sectors of the economy

Telephony based transactions can lead to substantial cost savings over branch based transactions, so that a shift towards more productive telephony based formats could have significant spillover effects on other parts of the economy. It is vital therefore that the UK telecommunications regulatory environment encourages the active participation of UK telecommunications companies in the newly developing environment.

- Telephone based transactions generally have a substantial cost saving over more traditional branch based transactions leading to significant price reductions for consumers. For example, interest rates at First Direct (a bank with no physical outlets) are consistently more favourable than those offered by branch-based competitors.

- The strong telephony culture in the US has played a key role in persuading Americans to adopt these new forms of transaction earlier than the UK. The US experience has shown that the potential for price reduction means that once these formats take off they tend to grow quickly; additionally, the global nature of telecommunications means that they can be launched into new geographical markets very easily.

- The use of *call centres* is much more prevalent than in the US than in the UK. For example, call centre FTEs in the UK comprise about 1 per cent of the working population, but 3 per cent in the US; and call centre industry spending in the UK is less than 1 per cent of GDP, whereas in the US it is about 2.5 per cent.

- The use of *Internet commerce* for both consumer and business to business transactions is far higher in the US than in the UK (Exhibit 22), is growing strongly and is starting to cross international borders. For example Amazon, a US based Internet book retailer which undercuts outlet based retailers, demonstrates the speed with which Internet commerce can take off within an industry (Exhibit 23). Nearly a quarter of Amazon's revenue is now international.

¶ If the UK can shift towards these new formats faster than its European counterparts, it will benefit not only from lower domestic prices but, as the Amazon case shows, also from the opportunity to export services abroad. Given the impact these changes could have on the UK economy as a whole, it is vital that the UK telecommunications regulatory framework actively encourages demand stimulation and innovation by telecommunications operators.

Lessons learned from the telecommunications industry

Despite the rapid developments anticipated in the industry, it is possible to draw some generic lessons from the past that will be important in helping the UK to capitalise on the changes that that the industry is currently facing. These lessons apply at both the regulatory and operational level.

¶ **Regulation:** At the regulatory level three clear messages emerge from the case, all of which will be relevant in the future.

1. *The importance of pricing structures in influencing customer behaviour.* Our analysis of the telecommunications industry clearly illustrates the role that pricing plays in influencing demand, and we would advocate low prices so long as they lead consumers to make rational decisions about the use of an economy's resources.

   However, we do not believe that either the US or the UK pricing models is optimal in this respect (Exhibit 24). While free local calling in the US has worked well to promote usage habits, it has required cross subsidisation of residential local calls and access charges by long distance calls, and may therefore have led consumers to underestimate the economic value of a local call. At the other extreme, pricing regulations in the UK have limited the rate at which BT has been able to stop subsidising access charges with calling rates, which in turn may have led consumers to underestimate the economic value of access and overestimate the value of call minutes.

While the UK policy was pursued for legitimate social reasons, it has significantly constrained output. Given this, an alternative may have been to allow higher access charges, but for the government to provide subsidies for consumers in low income brackets, similar to the US 'Lifeline' scheme. In the future, and in other industries where pricing regulation is required, operators should be encouraged to move to economic pricing structures as fast as possible.

2. *The importance of developing a level playing field both when markets are opened up, and as they then evolve.* The telecommunications industry also illustrates how regulations that provide incumbents with operating advantages (e.g., unequal access, lack of number portability) inhibit competition. Going forward, and as technologies from different sectors converge, the key challenge will be to ensure that regulation is fair not only within telecommunications, but also across the wider electronic communications industry. For example, the performance of cable communication companies is affected not only by telecommunications regulation, but also by television regulation. Thus, some commentators have argued that regulations that have allowed BSkyB to develop a strong position in premium TV content have reduced the competitive threat posed by cable companies in telephony by squeezing profits in their television operations.

3. *Where monopolies remain, the importance of providing an environment to encourage demand stimulation and the development of new technology*. While the NERA work illustrates how successful regulation can be in promoting operating efficiency, our analysis illustrates how difficult it is to regulate for innovation (other than through competition). Given that some parts of the UK's communications and other utility infrastructure will inevitably remain as effective monopolies, at least in the short term, future regulation must find ways to encourage operators of these networks to focus on demand stimulation and innovation, to ensure that the maximum value is extracted from high fixed cost networks. Thus, for example, upgrading the local loop through technologies such as xDSL (Digital Subscriber Lines) would significantly increase bandwidth and so allow for faster and cheaper transfer of data intensive information (e.g., still images, video, sound). If it is felt that these services should be available to subscribers in areas with no local loop competition, for example

those areas without cable operators, regulatory intervention, at least in the short term, may be needed to promote the required investment.

¶ **Operations:** At the operational level the telecommunications case shows that demand stimulation can significantly enhance productivity. Operators should therefore focus on increasing usage by reducing call prices, boosting marketing activity and providing value added services.

Specific actions, many of which BT and others are already implementing, include:

- *Continuing to reduce calling prices:* Operators should continue to reduce call rates to help address low usage habits, although as explained above rates should not go below the long run marginal cost of providing the service. This will doubtless require increases in access charges. To make this more acceptable (and help promote usage), operators may wish to consider raising access charges, but bundling a number of calling minutes in with this charge.

  As lower calling rates work to change user habits, the UK should start to benefit from greater use of Internet services, direct sales etc.

- *Marketing:* As BT's research shows, one of the key constraints to increasing usage are consumers' long standing price misperceptions. As prices are reduced, operators need to develop innovative marketing techniques to capitalise on these reductions. Examples include

  – Increased advertising on price information.

  – Monthly rather than quarterly billing to reduce the absolute size of consumers' bills and to provide consumers with faster feedback about the cost of their calls (the US has always had monthly billing).

  – Simplified itemised billing - while itemised billing is now standard for BT, the layout of the bill is relatively complicated and may deter people from trying to understand the composition of their charges.

  – Discount schemes such as 'Friends and Family' or, as mentioned above, bundling of free minutes with access charges to give the impression that calls are cheap.

- *Providing value added services:* Finally, operators should continue to develop and market aggressively value added services in both the business and residential markets such as free phone, voicemail and call waiting. They should also look to provide consulting and/or outsourcing services to help businesses seeking productivity improvements through greater use of telephony – for example through setting up call centres, web sites or EDI links with suppliers.

Appendix: Methodology for productivity calculations

To compare the performance of the UK telecommunications sector with that of other countries we investigated output, labour and capital inputs, and labour and capital productivity.

- **Output:** Minutes of usage per capita and / or main lines per capita. No adjustment is made to distinguish local from long distance and international minutes, and international minutes are allocated to the originating country only. We do not believe this error is large relative to the productivity gap. As we are using a physical output measure, no PPP is required.
- **Labour inputs:** Number of FTEs adjusted for differences in hours worked across countries.
- **Capital inputs:** Capital services have been calculated by building capital stock estimates from annual capital expenditure data and assuming a sudden death depreciation schedule after 18 years. We have not accounted for obsolescent assets but do not believe that the impact of this error is large relative to the productivity gap. Capital services data were converted into common currency using a weighted OECD investment goods PPP.
- **Labour productivity:** Output divided by labour inputs.
- **Capital productivity:** Output divided by capital services per capita.
- **Total factor productivity:** Labour and capital productivities were combined using a Cobb-Douglas function with value added shares of labour and capital of 35 per cent and 65 per cent respectively.

Exhibit 1

REGULATORY AND COMPETITIVE ENVIRONMENT IN 5 TELECOMMUNICATIONS INDUSTRIES

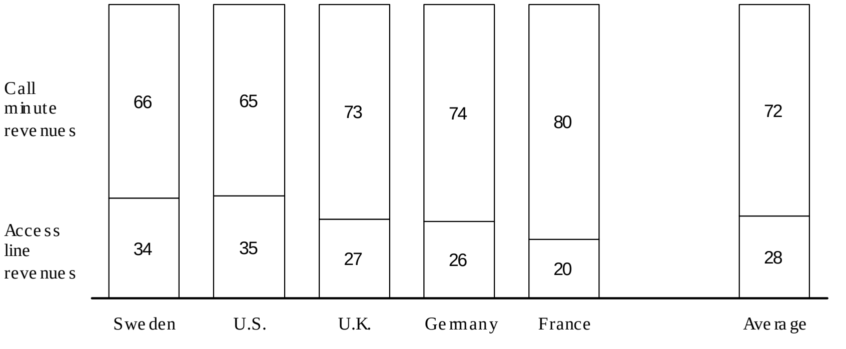
	U.K.	U.S.	Sweden	France	Germany
Regulation	• Government-enforced monopoly until 1983 when one competing carrier was allowed; further opened to new entrants in 1992	• Open competition for long distance services since 1984 • Local deregulation since 1997	• De facto monopoly until 1992 with no formal regulation • Regulator grants licences	• Government-owned monopoly • Progressive deregulation to be completed in 1998	• Government-owned monopoly, partially privatised in 1996 • Progressive deregulation to be completed in 1998
Competition					
• Local voice	• Multiple competitors, incumbent dominant	• Primarily monopoly, competition mostly in business services	• Competition developing	Competition started in 1998	Competition started in 1997
• Long distance voice	• Competition now quickly developing, incumbent dominant	3 major carriers and several hundred minor carriers and resellers	Multiple competitors, incumbent dominant		
• International voice	• Competition already intense				
• Data	• Many competitors	• Many competitors	• Many competitors	• Open to competition • Primary competitor government-owned	• Open to competition • One strong private competitor
• Mobile	• 4 primary competitors	• At least 2 carriers in each metropolitan area, more developing quickly	• 3 carriers	• 3 carriers	• 3 carriers, fourth one licensed
• Private networks (voice and data)	• Open to competition	• Open to competition	• Open to competition	• Open to competition	• Open to competition

Source: McKinsey; OECD

Exhibit 2

RATIO OF REVENUES EARNED FROM CALL MINUTES AND ACCESS LINES *APPROXIMATE*

%

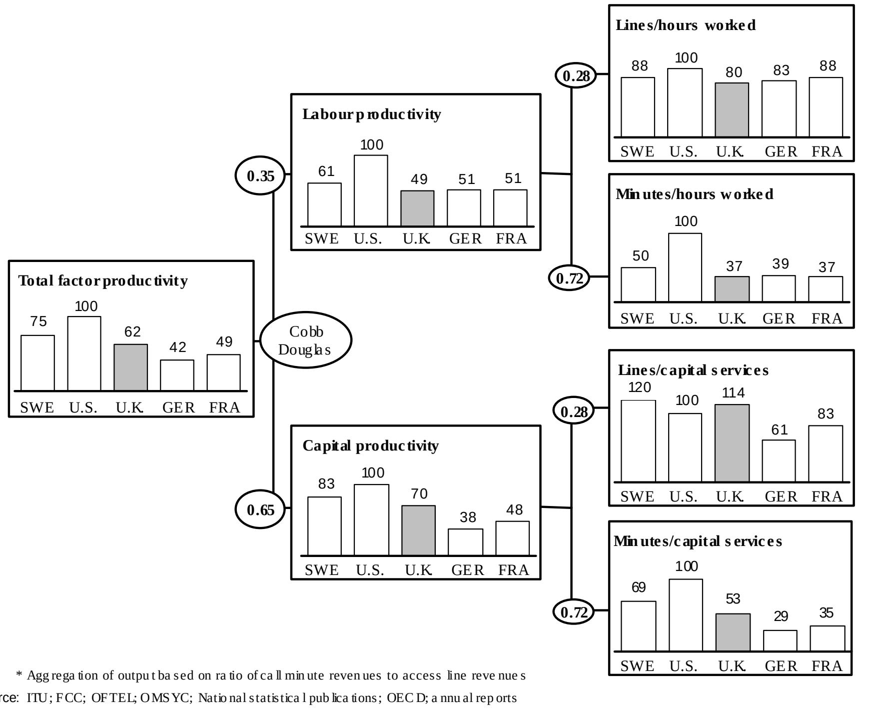


Source: Dataquest; FCC; Probe research

Exhibit 3

AGGREGATE TELECOMS PRODUCTIVITY*, 1995 *APPROXIMATE*

Indexed to U.S. = 100



* Aggregation of output based on ratio of call minute revenues to access line revenues

Source: ITU; FCC; OFTEL; OMSYC; National statistical publications; OECD; annual reports

Exhibit 4

CAUSALITY FOR PRODUCTIVITY DIFFERENCES

● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
\- Undifferentiating (<3 points of the gap)

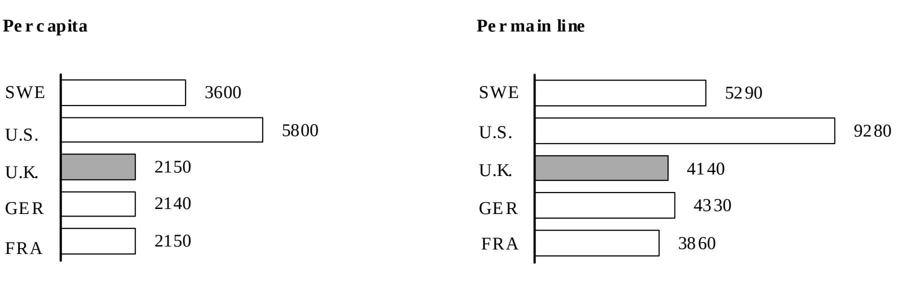
		U.K. vs . U.S.	U.K. vs. Sweden
External factors	• Fiscal and macroeconomic environments	●	-
	• Product market		
	– Trade/FDI barriers	-	-
	– Product regulations	●	●
	• Labour market		
	– Labour rules/unionism	-	-
	– Relative labour cost	-	-
	– Education	-	-
	• Capital market		
	– Corporate governance/government ownership	○	-
	– Access to capital	-	-
	• Other external factors		
	– Other industries /up and down stream	-	-
	– Country specific factors	-	-
Industry dynamics	• Competition with best practice	-	-
	• Domestic competitive intensity	○	-
Production process	• Mix of products and services/marketing		
	– Product category mix	-	-
	– Value added within category	-	-
	– Product proliferation	-	-
	– Pricing structure/marketing	●	●
	• Production factors		
	– Capital intensity/technology	-	-
	– Scale	-	-
	– Frontline skills/trainability	-	-
	– Matching capacity to demand	-	-
	• Operations		
	– Organisation of functions and tasks	-	-
	– Design for manufacturing	-	-
	– Suppliers and supplier relationships	-	-
	Productivity performance* (comparison country = 100)	62	83

* Total factor productivity

Exhibit 5

VOLUME OF TRAFFIC, 1995

Annual traffic, minutes

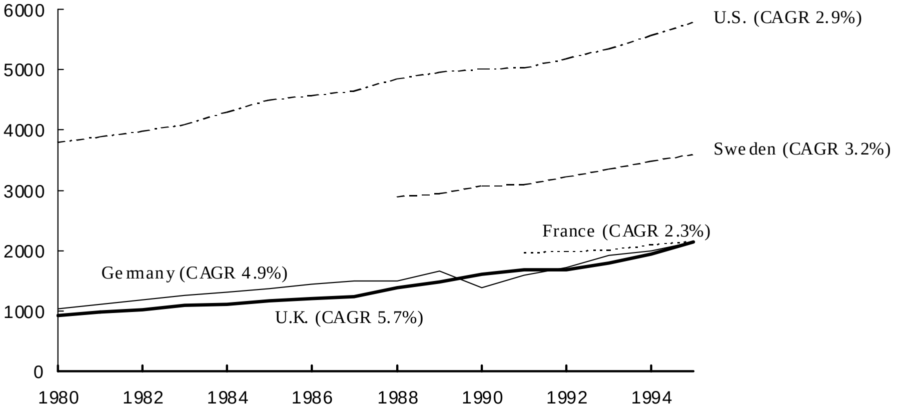


Source: ITU; FCC; OMSYC; National statistical publications; McKinsey analysis

Exhibit 6

TELECOMMUNICATIONS DEMAND OVER TIME

Minutes/capita



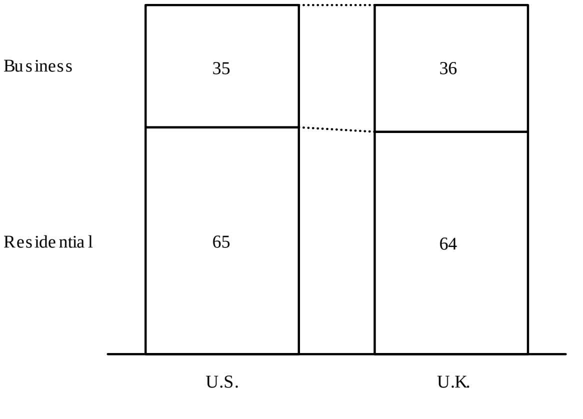
Source: FCC; ITU; OMSYC; National statistical publications; McKinsey analysis

Exhibit 7

TYPE OF CALL BY ORIGIN – U.S. VS. U.K.

ESTIMATE

Distribution of minutes by absolute volume*, %



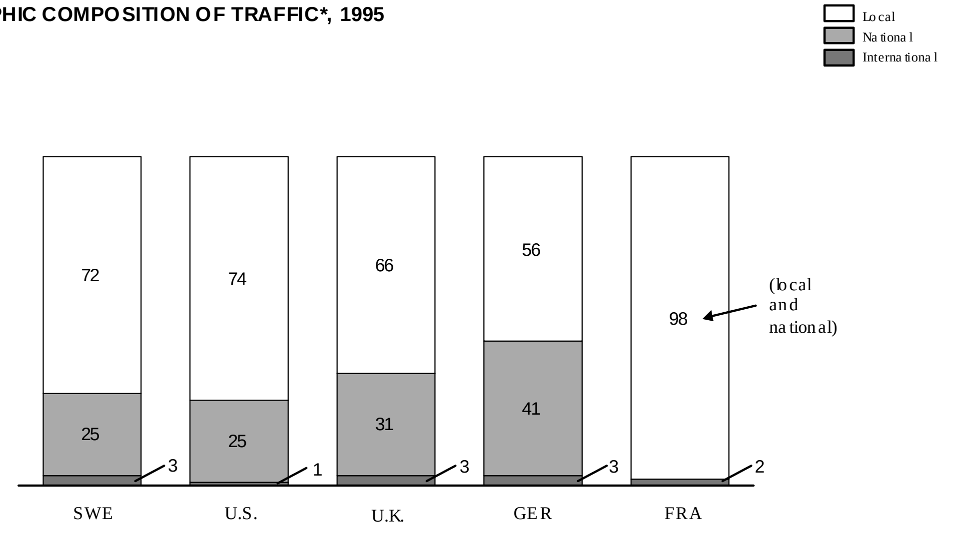
* Based on figures for one RBOC within U.S., total market for U.K.

Source: OFTEL; FCC; National Exchange Carrier Association; McKinsey estimates

Exhibit 8

GEOGRAPHIC COMPOSITION OF TRAFFIC*, 1995

%

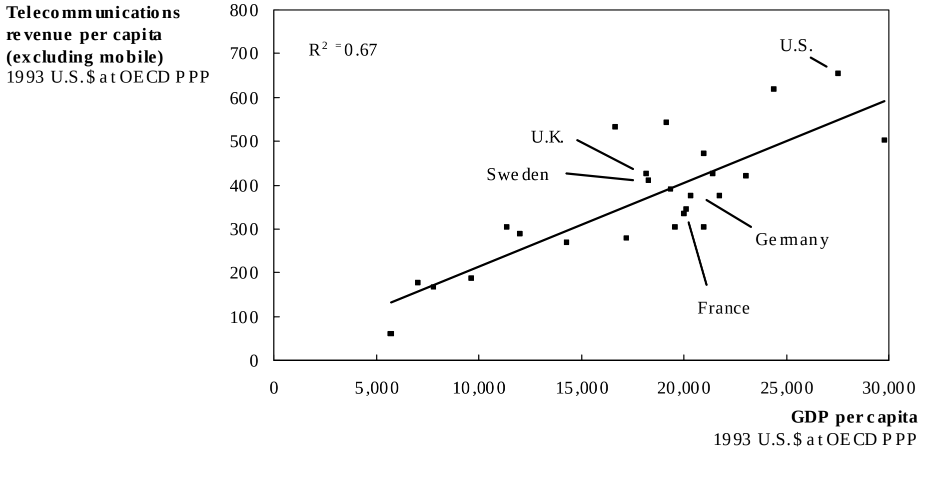


* The definition of local vs. national calls differs across countries and regions, however, the average number of people in a local area is similar

Source: ITU; FCC; OMSYC; National statistical publications; McKinsey analysis

Exhibit 9

OECD COUNTRIES INCOME LEVELS AND TELECOMS SPENDING*, 1995



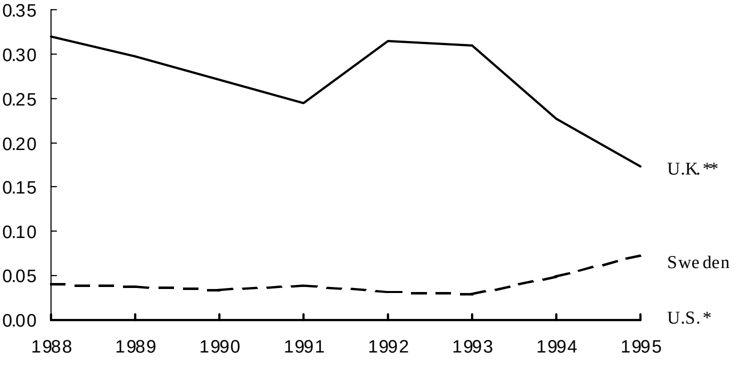
* Figures may be partially corrupted by the inclusion of receipts from foreign operators for incoming international calls, data excludes Turkey

Source: OECD; McKinsey analysis

Exhibit 10

RESIDENTIAL LOCAL CALL PEAK TARIFFS: INCREMENTAL COST OF 3 MINUTE CALL

U.S.$ in 1993 constant prices, PPP adjusted, incl. taxes



* Unlimited local call option, available in most areas

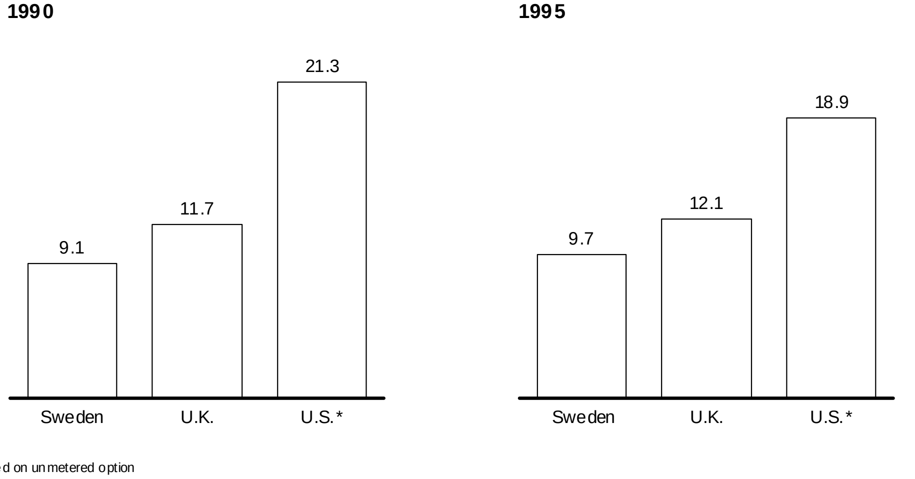
** Large rise from 1991 to 1992 attributable to small increase in rate per minute with no associated increase in meter step so that whereas a 3 minute call represented 3 steps in 1991, it represented 4 steps in 1992

Source: Tarifica; OECD; ITU; McKinsey analysis

Exhibit 11

RESIDENTIAL MONTHLY ACCESS CHARGES

U.S.$, 1993, PPP adjusted, incl. taxes



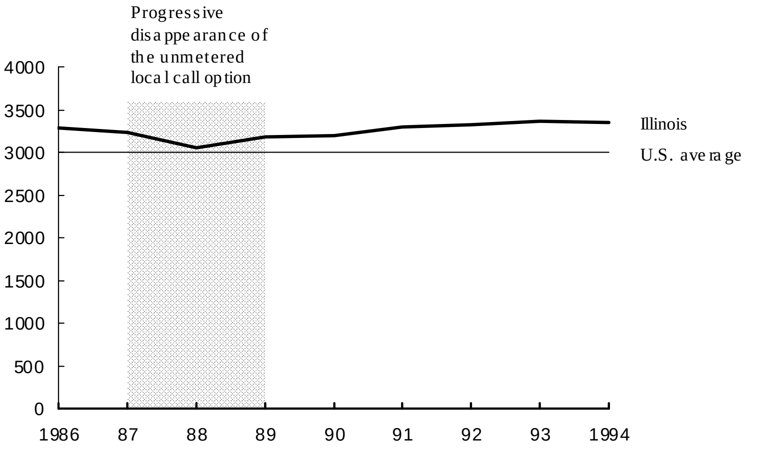
* Based on unmetered option

Source: Tarifica; FCC; CCMI

Exhibit 12

TELEPHONE USAGE IN ILLINOIS

No. of calls/line

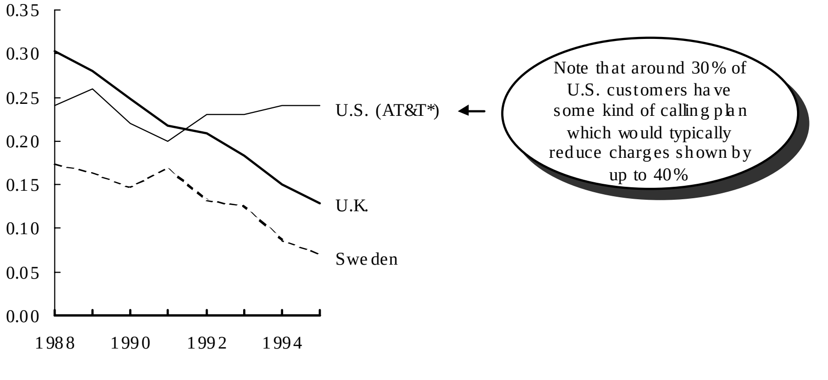


Source: FCC; Ameritech

Exhibit 13

RESIDENTIAL LONG DISTANCE CALL PRICING (~ 50 KM, PEAK RATES)

U.S.$ in 1993 constant prices, PPP adjusted, incl. taxes



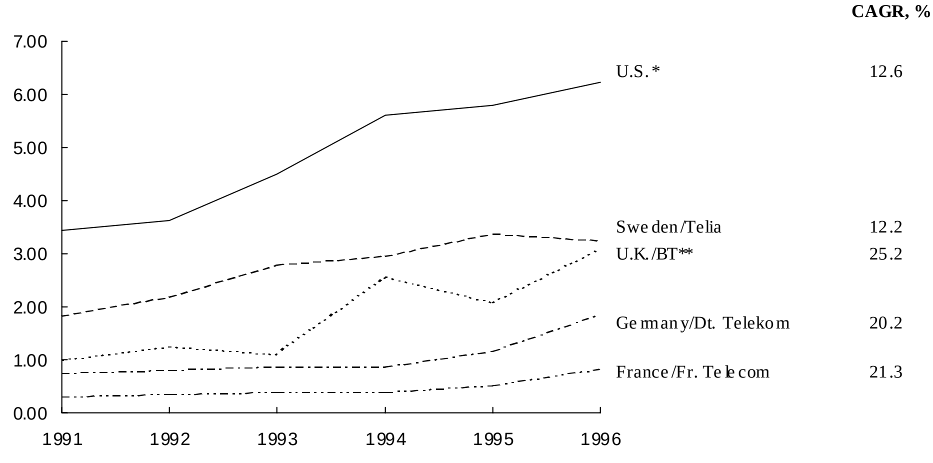
* MCI and Sprint have almost the exact same tariffs in this timeframe

Source: Tarifica; OECD; ITU; FCC; McKinsey analysis

Exhibit 14

ADVERTISING SPENDING PER CAPITA

U.S.$ in 1993 constant prices, PPP adjusted



* RBOCs, AT&T, MCI and Sprint
** Excludes advertising spend on public offerings

Source: BAR/LNA Multi-Media Service; Nielsen; MEAL; Secodip

Exhibit 15

VARIETY OF TELEPHONE SERVICES, 1996

● Existing in 1992
○ Introduced after 1992
--> Promotes usage

		U.S.	Sweden	U.K.	France	Germany
Pricing	Flat rate and call charge	●	●	●	●	●
	--> Unlimited local calls	●				
	--> Volume discount	●	●*	●	●	
	--> Favourite numbers discount	●	○	○	○	○
Billing	--> Collect call	●	●	●	○ ****	○
	--> Credit card call	●	●	●	●	○
	--> Prepaid card call		●	●	●	●
	--> Third party billing	●	●			
	--> Toll-free line	●	●	○	○	●
	--> Itemised billing	○	●	○	○	○
Operator service	--> Directory service	●	●	●	●	●
	--> Call completion service	●				○
	On-the-phone translation services				○	○
	Other operator assistance**	●				○
Functional services	--> Call waiting	●	○	●	●	○
	Speed dial	●	●	○		○
	--> 3 way calling	●	●	●	●	○
	--> Call forward	●		○	○	●
	--> Priority call	●	○		●	○
	Call block	●	●			○
	--> Repeat call	●	●	○	○	○
	Call barring	●	●	○	○	
	--> Reminder call		●	○	○	○
	Other functional services***	●	●		○	○

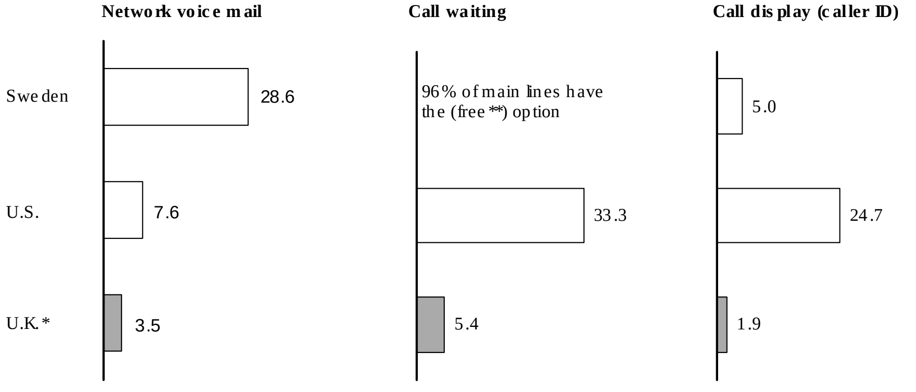
* Business customers only
** Call verification (operator-assisted call, person-to-person call, etc.)
*** Caller display, tone block, return call, home intercom, ultra forward
**** Only for international calls

Source: Telephone books; interviews

Exhibit 16

RESIDENTIAL CUSTOMER USAGE OF SELECTED VALUE-ADDED SERVICES, 1996/1997

%



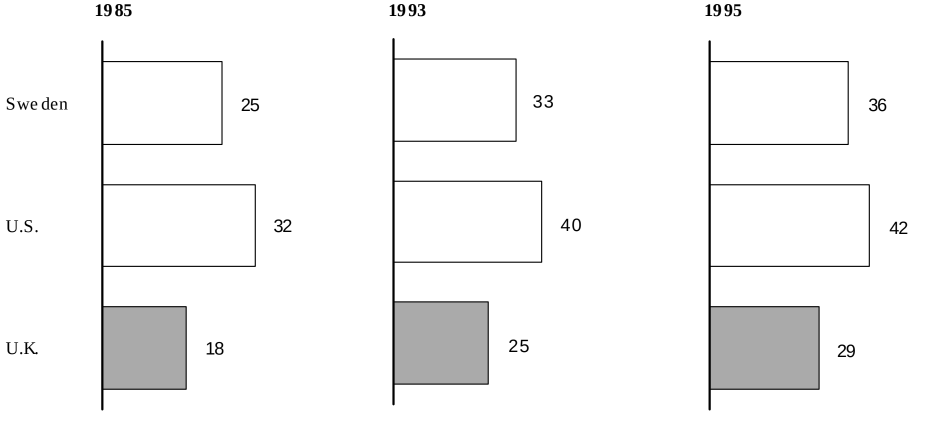
* Total number of subscribers over residential exchange lines (i.e., numbers possibly overestimated)
** Call waiting is one of several services included in the connection to the AXE system (digital lines) and is not separately charged for

Source: OFTEL; IDC/LINK's 1997 North American Residential Telecom Survey; McKinsey analysis; OECD; Telia

Exhibit 17

NUMBER OF BUSINESS LINES PER EMPLOYEE*

Business mainlines per 100 employees in the national workforce**

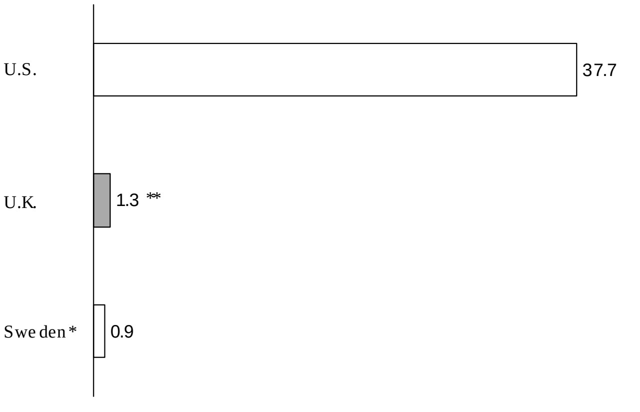


* Not adjusted for Centrex, adjustment would increase the U.S. figure without significantly affecting the figures for the other countries
** Civilian employment

Source: OECD

Exhibit 18

FREEPHONE NUMBERS IN USE PER 1000 POPULATION



* In Sweden, freephone penetration is relatively low, because calling prices are already perceived to be cheap

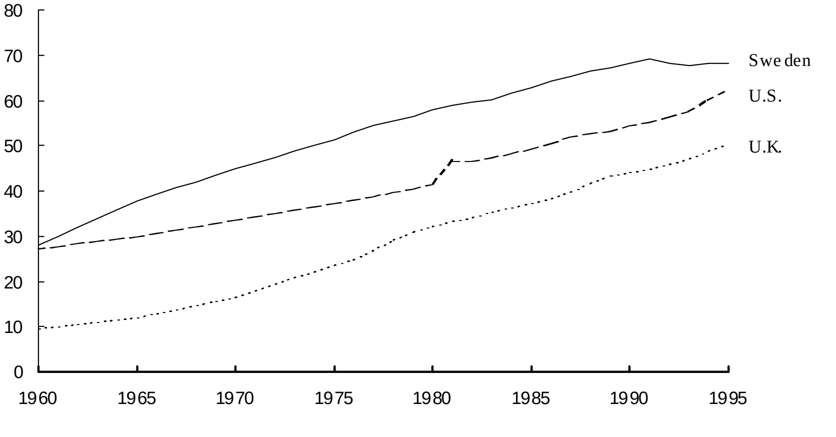
** Excludes 0345 numbers (charged at local rates)

Source: Dataquest 1997; OMSYC

Exhibit 19

HISTORICAL LEVEL OF FIXED TELEPHONY PENETRATION

Main lines per 100 inhabitants

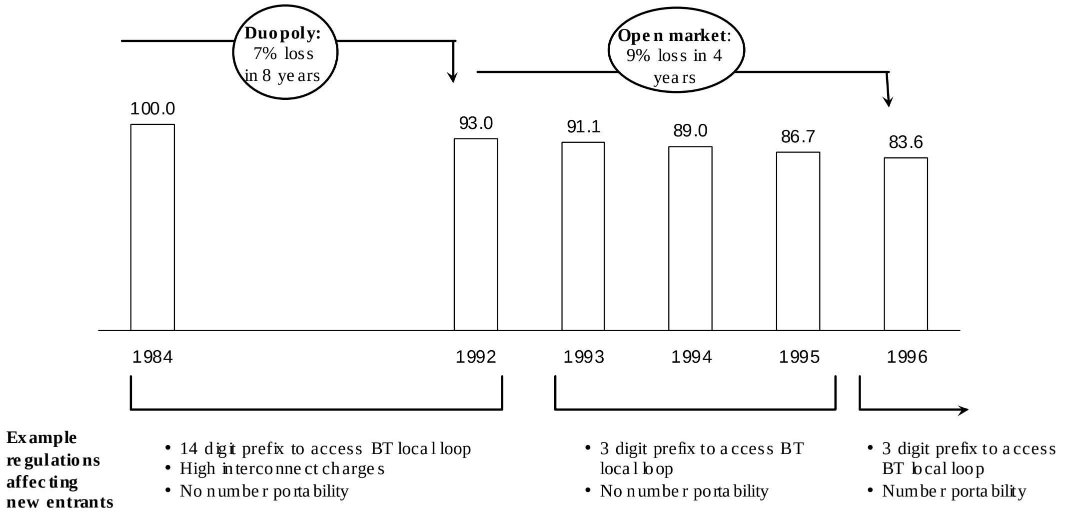


Source: ITU; McKinsey analysis

Exhibit 20

BT MARKET SHARE

% of traffic in minutes

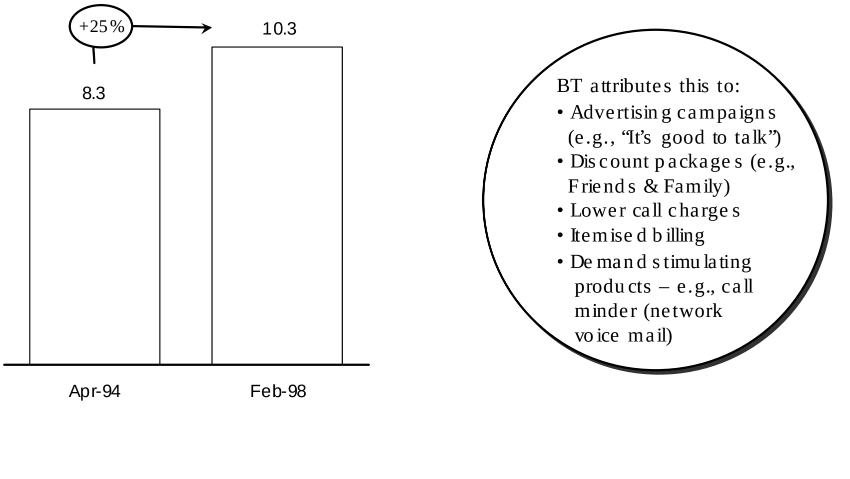


Source: Oftel; McKinsey Analysis

Exhibit 21

AVERAGE TIME SPENT ON THE PHONE PER HOUSEHOLD PER DAY

Minutes

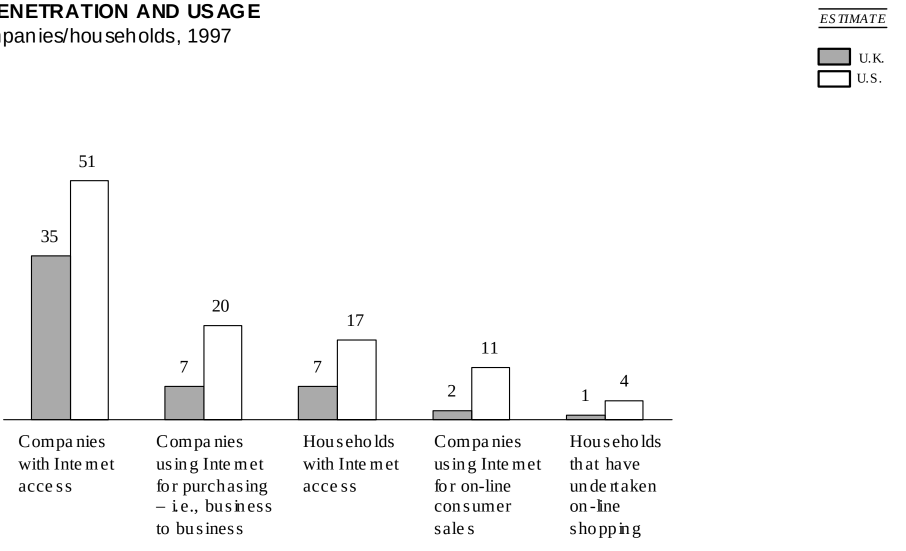


Source: BT

Exhibit 22

INTERNET PENETRATION AND USAGE

% of total companies/households, 1997

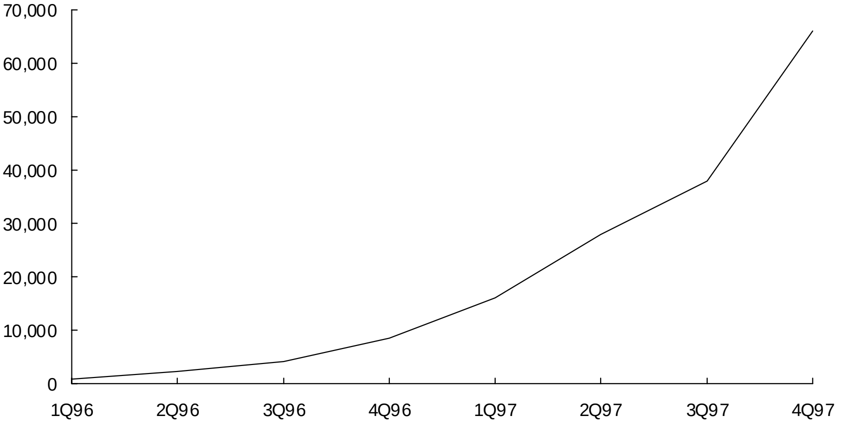


Source: Spectrum ICT Survey 1997

Exhibit 23

AMAZON. COM SALES

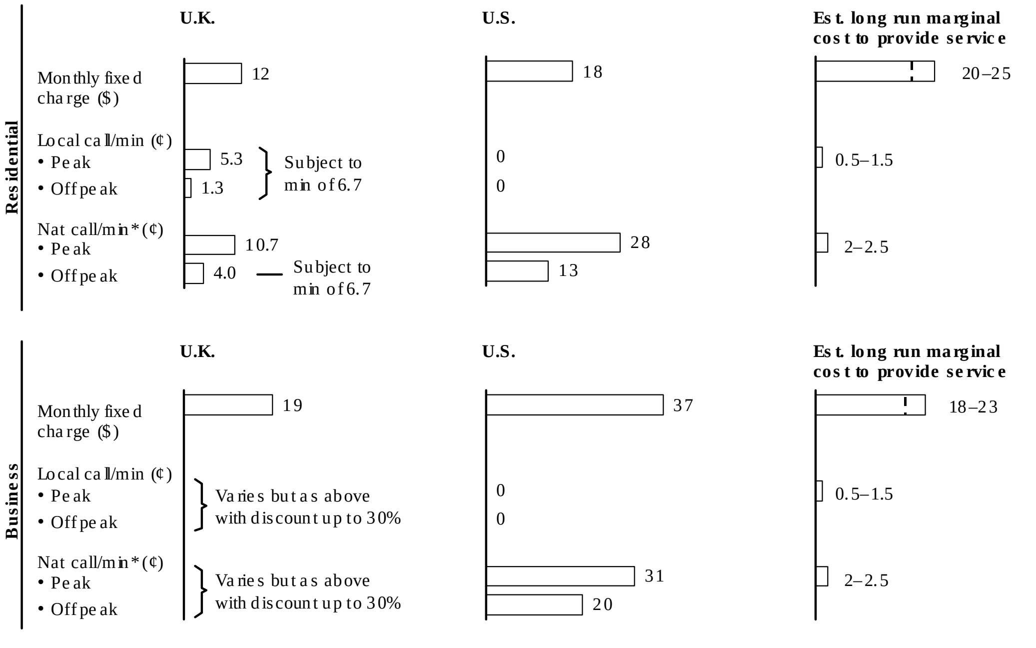
U.S.$ 000



Source: Company reports

Exhibit 24

PRICE AND COST OF TELECOMS SERVICES (BEFORE TAX AND DISCOUNTS)



* Based on call of 63km

Software and Services

EXECUTIVE SUMMARY

The software and services sector is one of the most rapidly growing global industries, currently exhibiting annual growth of around 12 per cent and generating revenues of $238 billion in 1996. The sector consists of three main sub sectors: packaged software, project services and processing services.

The UK software and services sector performs poorly compared with the US.

- ¶ Output per capita for packaged software and services combined is 27 per cent of the US level. Output is particularly low for packaged software at 12 per cent of the US figure. This is a function of low consumption in the UK and a very negative trade balance with the US. For the two software service sectors output is approximately half the US level.

- ¶ Labour productivity for the packaged software sub segment is 53 per cent of the US level. For project and processing services, however, labour productivity is about equal to the level in the US.

The primary cause of low labour productivity in the UK packaged software segment is a lack of successful companies of a comparable scale to those found in the US. Productivity for packaged software increases with output, as many labour inputs are fixed. The US contains six software companies with turnover of over $1 billion, and many with a turnover in excess of $100 million. In the UK there are only a handful of companies with revenues greater than $100 million.

One of the primary external factors influencing this lack of scale in the UK packaged software sector is a lack of leading edge demand for products in the UK from business customers. This lack of demand stems from lower levels of competitive intensity in some UK industrial sectors, which reduces the necessity for software tools which enhance productivity. UK companies also face a number of disadvantages in penetrating the US market, compared with US domestic competitors.

In addition, the UK lacks an infrastructure that can support high growth companies. A critical element of this infrastructure is venture capital funding. The UK venture capital industry does not focus on the high-tech sector and lacks the skills of US venture capitalists that help nurture companies in the early stages.

In spite of historical performance the UK software sector should be viewed as a key area where the UK has the ability to create growth in output and employment. The UK possesses several industry sectors, for example retail and financial services, which have a leading edge appetite for IT and could provide the necessary stimulus to grow a globally successful software company. The focus for policy makers should be to increase competitive intensity in customer markets for the UK software sector in order to stimulate demand by, for example, revising product market regulations which restrict innovation and competition. In addition, the government should look to facilitate the removal of remaining infrastructural barriers.

Software and Services

INTRODUCTION

The external software and services sector is interesting because it is a relatively new market service sector, a source of high value jobs and subject to very little regulation. Furthermore, although it is currently relatively small, with UK sales representing only 1 per cent of GDP, we believe that the sector provides insights into how to grow other new, technology driven industries such as biotechnology. A successful software sector can also have a number of spin-off benefits for an economy. It can create high value jobs, both in software and in other service sectors, generate considerable personal wealth for entrepreneurs and facilitate productivity gains in other sectors, e.g. by reducing the cost of business to business interactions via the Internet, or improving supply chain management.

Software and services represent a substantial share of the world-wide computer industry (Exhibit 1), an industry that is growing at a rate of 10.4 per cent per annum. The sector itself can be broken down into three main sub sectors: packaged software, project services and processing services.

Packaged software

This sub sector generated worldwide revenues of $109 billion in 1996. It is dominated by US companies, which hold over 75 per cent of the market. The packaged software market can be further divided into nine segments, by software type and hardware environment (Exhibit 2).

On the software axes, systems infrastructure and applications tools products are primarily driven by the development of new technologies. Market share is concentrated in the hands of a small number of US companies such as IBM, Novell, Oracle and Microsoft, who together account for 35-40 per cent of the market (Exhibit 3). In most cases this dominant position has developed due to a number of industry forces which tend to push these markets towards natural monopolies. For example, for operating system software (50 per cent of the systems infrastructure market) companies prefer to invest in the most popular platform and applications developers will always build for the most widely used platform, re-enforcing the dominance. As a result IBM holds over 80 per cent of the operating system software market in the mainframe environment and Microsoft over 80 per cent in the desktop environment. Operating system providers then have a number of advantages in developing and marketing basic application tools, e.g. spreadsheets and databases. The dominant share position of US companies like Microsoft, achieved in part due to their first mover advantage makes them relatively unassailable, until there is a major shift in technology. One such shift might be a move towards Internet PCs, which link directly to the Internet and require no operating system as such. Overall the systems infrastructure and application tools markets are dominated by US companies, with around 90 per cent market share.

The applications market is more fragmented and a higher share is held by non-US companies, with 35 per cent of the market. This market is driven primarily by the needs of business customers, with enterprise (i.e., non-consumer) software generating 90 per cent of revenue in 1996. Enterprise software falls into two categories. Vertical market software caters for the needs of a particular industry sector, for example banking. Horizontal market software caters for the needs of an industry function, for example human resources. The first mover advantage of US companies is less important in the enterprise software market and a number of non US companies such as SAP (Germany), Baan (Netherlands) and Misys (UK) have built a substantial presence in the last 10 years.

Consumer software accounts for less than 5 per cent of packaged software revenue. Success in consumer software is driven by strong brands and publishing and distribution channels. The US is by far the largest market for consumer software and so controls most of the successful brands and established channels to market.

In terms of software for different hardware environments, the mainframe environment is the most concentrated, dominated by IBM with a 30 per cent share. The client and server environments are more fragmented, but again with strong leading players such as Novell and Microsoft. The server environment, although currently the smallest, is growing the fastest and is currently the scene of a power struggle as Microsoft seeks to extend its dominance into this arena. Until recently, network computing was limited to servers operating within corporations. However the growth of the Internet together with the globalisation of many industries has led to the development of external networks, making use of very powerful servers and new computing languages such as Java, developed by Sun.

In spite of US dominance in many segments, the packaged software market still represents an attractive opportunity for non-US, new ventures and existing companies. The segments least dominated by US companies and most fragmented e.g., business applications in the server environment, are also growing the fastest, with annual rates in excess of 30 per cent.

Project services

Project services includes activities such as contract programming, systems integration, customised software, consultancy and training. In 1996 this sector generated global revenues of around $100 billion and it is growing at around 12 per cent per year. Unlike packaged software, which is a global industry, project services are generally supplied and consumed locally, as close customer relationships are critical. Output in any country is therefore directly related to consumption. Output in project services is also closely related to packaged software consumption, as many projects are concerned with its implementation.

In the US, project services is becoming an increasingly sophisticated market with companies like Cambridge Technology Partners leading the way in developing standard, branded service products. Historically US project services companies have found it more difficult to raise start up and expansion capital than packaged software companies, because their revenue potential was perceived to be much lower. However with the increased innovation and sophistication in the services sector, companies in the US are now attracting venture funds and achieving market capitalisations of up to ten times revenue.

Processing services

This industry has developed as a result of the trend for companies to outsource their routine IT driven activities. In 1996 it generated a global revenue of 30 billion US dollars. As with project services, processing services are generally traded domestically, although recently there has been a shift towards international sourcing from low cost providers such as India.

Comparison countries

This report compares UK productivity with that of the US, France and Germany (East and West). The UK's consumption of external software and services, as a percentage of GDP, lags the US but is ahead of France and Germany (Exhibit 4). The US, however, has a large positive trade balance for packaged software, whereas the UK imports around 70 per cent of domestic consumption. In terms of employment, precise measurements are difficult to obtain but we estimate that the sector employs around 100,000 people in the UK, approximately 0.5 per cent of market sector employment, and a similar percentage of the population in France and Germany. In the US we estimate the sector employs around 1.2 million people, closer to 1.2 per cent of market sector employment.

PRODUCTIVITY PERFORMANCE

We compared software sector performance in the UK with that in the comparison countries on the two main criteria of productivity and output. Details of the methodology used for calculating these are provided in the Appendix. For the overall sector, UK labour productivity is 72 per cent of that in the US and output 27 per cent of the US level (Exhibit 5). The three sub sectors are quite different in nature, so we also compare them separately.

Packaged software

In packaged software, output of all the European countries trails the US by a factor of around 8. Productivity fares somewhat better although the UK still lags the US by 50 per cent (Exhibit 6). Germany's strong productivity performance is related to the relative dominance of the highly productive SAP. In absolute terms the packaged software sub sector generates higher productivity than the service sub sectors, in all countries.

Project and processing services

In both project and processing services, the productivity of all the countries surveyed is similar. However output is 50 per cent lower in the UK, France and Germany compared with the US (Exhibits 7-8).

REASONS FOR DIFFERENCES IN PRODUCTIVITY AND OUTPUT PERFORMANCE

It is clear that the UK software and services sector has substantially lower output than the US, for all activities. However there is only a productivity gap in the packaged software sub sector. In this section we describe in detail the reasons for the productivity gap in packaged software and also the causes of the output gap for the entire sector. As the US is clearly the benchmark country, we restrict our analysis to comparison with the US.

Productivity performance

Exhibit 9 shows the framework with which we have analysed the productivity gap across all the sectors. It divides the causes of the productivity gap into three groups. At the lowest level productivity differences are caused by differences in production processes within firms. These differences are driven, however, by factors external to the firm, both within the industry sector and the economy at large.

Production processes

At the production process level, the most important factor explaining the productivity gap is the scale of UK software companies relative to their US counterparts, which stems from lower levels of innovation. Also of consequence but to a lesser extent is the product mix and skills levels.

¶ **Value added within category: innovation:** Success in packaged software relies on the development and commercial exploitation of innovative products, on a global basis. The UK software sector has failed to develop and market a sufficient number of world leading innovative products. As a result the UK has not grown companies of the scale of Microsoft, Oracle or SAP. This lack of scale, discussed below, is the main factor explaining the productivity gap with the US.

¶ **Scale:** Low output in a packaged software company has a direct impact on productivity as many of the labour inputs are fixed, for example product development staff. Successful companies with high output enjoy large economies of scale and generate high labour productivity. For example, Microsoft generates revenues of over $8 billion from a workforce of less than 20,000 people globally. The US packaged software sub sector has a core of very large companies such as IBM, Microsoft, Computer Associates and Novell with billion dollar turnovers, as well as a good number of companies with sales in excess of $100 million (Exhibit 10). The UK packaged software sector consists mainly of a handful of medium sized companies with revenues over $100 million and a large number of small companies with turnovers of less than $10 million (Exhibit 11). There are only two software companies with sales of over $1 billion outside the US: SAP (Germany) and Hitachi (Japan).

We do not believe that the relatively small size of the UK market can be held responsible for the lack of scale in UK packaged software companies. The software market is global and the scale of successful companies such as SAP is not ultimately constrained by the size of their domestic market. However, as discussed below, low domestic demand does constrain innovation and therefore scale.

For software services, labour inputs are largely variable with output, and hence economies of scale are limited. This explains why the UK service sub sectors can have a high productivity in spite of their relatively low output.

¶ **Product category mix:** In all the countries studied the packaged software sub segment has the highest absolute productivity. In the UK the sector represents only 27 per cent of the product mix, whereas in the

US it represents 59 per cent. The US total sector productivity is therefore boosted by this more favourable mix of sub sectors.

¶ **Frontline skills/trainability:** All start-up companies agree that finding the right skills is the one of the biggest challenges they face. Successful companies often aim to quadruple their size in a year in the early stages. Start-up software companies require technical, managerial and sales and marketing talent.

- The scarcity and cost of IT skills in the US have led a number of US companies to establish development centres overseas. If anything, this is an area of comparative advantage for the UK, which produces more IT graduates per capita than the US (Exhibit 12).
- However UK software companies find it hard to attract blue chip management skills in the early stages. Our interviews suggested that UK managers are more risk averse than their US counterparts, due to less flexible and forgiving job markets and lower personal wealth. In addition a manager from a large company will not necessarily possess the right skill set. In the US the large number of high tech companies provide a training ground for managers. In addition up to 20 per cent of MBA graduates from Harvard and Stanford now enter either high tech companies or venture capital firms.
- Proven sales and marketing skills in the software sector in the key US market are difficult for all companies to acquire. The ability to offer NASDAQ share options is generally a prerequisite for hiring the best sales and marketing staff, and whilst this is not impossible, it is clearly more difficult for UK companies.

External factors

From an external perspective, key factors explaining the productivity gap are other industries up and downstream and access to capital; of lesser importance are land use regulation and the less visible entrepreneurial culture in the UK.

¶ **Other industries, up and downstream:** We found four areas where issues relating to other industries up and downstream from the packaged software sector contributed to the productivity gap: demand from local leading edge customers, concentration of customer demand in the US, clustering and links with universities.

1. **Demand from local leading edge customers:** A healthy domestic industry requires strong local demand for products to stimulate innovation, and in general the UK market does not provide this demand.

- In the early stages start-up software companies need a critical mass of customers with a leading edge demand for technology in order to develop and refine their products. Exhibit 13 shows UK demand for packaged software is half the level in the US and moreover the gap has increased in the last 5 years (Exhibit 14). Exhibit 15 provides examples of software companies that have benefited from leading edge demand.

- The business sector is responsible for the majority of IT consumption in the UK. The low demand for IT products by UK business is driven by two factors (Exhibit 16). Firstly, output per capita in many sectors and in the economy as a whole is below the US level. This means that firms have less money available to invest in IT. Secondly the UK spends a lower proportion of its output on IT. The main driver of IT expenditure is usually a desire by firms to improve productivity by reducing costs or improving marketing. To create this drive for productivity growth, companies need to be operating in a competitive environment. In UK sectors such as wholesale financial services, which have undergone deregulation and are considered to be highly competitive, the appetite for IT expenditure is similar to the US.

- In some software segments the US government and its agencies act as 'leading edge' customers frequently sponsoring projects to pull through new technical standards. The policy in the UK public sector is to wait for technology to be proven, often in the US, before it is adopted. It is also more difficult and more expensive to spin-off commercial products developed as a result of government projects in the UK. For example, the UK insists on 'full cost recovery' pricing of products developed in a government sponsored project. In the US development costs are considered 'public goods' and products may be sold at replication cost.

2. **Concentration of customer demand in the US:** The packaged software market is global and low customer demand in the UK and Europe does not entirely explain the UK's poor performance. We have found that UK companies are also less able to access the key US market, compared with US domestic competitors. This is vital for software companies to grow to a reasonable size as the US currently consumes 50 per cent of the total global packaged software output. Even successful non-US companies such as SAP and Baan did not really take-off until they began to increase penetration of the US market (Exhibit 17).

- Non-US companies must establish credibility with US customers to be successful. This is particularly important if a new technology is involved. Credibility is most easily achieved if a software company has a number of leading edge domestic customers who also operate in the US. These customers can then act as reference customers to establish credibility in the US market. For example Baan's breakthrough in acquiring Boeing as a client initiated their success in the US and SAP have pursued a strategy of using multi-national clients as a springboard into new markets.

- There are few sectors in the UK that contain customers with a leading edge demand for technology, who also have a significant presence in the US market. One sector which fulfils this criterion is wholesale banking. This is one of the few sectors where UK companies hold a substantial global market share, in the vertical market for applications software. In other vertical markets, like healthcare, US companies are dominant (Exhibit 18). US companies are able to develop reference customers in the US market at an early stage. Moreover standards developed in the US are frequently adopted globally. Hence US companies are then ideally placed to expand internationally.

- Other factors, which can lend credibility to a company in the US, are a NASDAQ listing or backing from a leading high tech venture fund. Both of these are less common among UK based companies.

3. **Clustering:** It is widely believed that the success of the US software industry derives from the early formation of successful high tech clusters such as Silicon Valley. In a successful cluster companies form mutually beneficial relationships with other companies up and down the supply chain, such as hardware companies or project service providers. Clusters form naturally when a number of demand side factors (e.g., the demand for silicon chips in California in the 1950s) and supply side factors (e.g., links with leading edge academic institutions) come together and reinforce each other.

   Software companies vary in their views as to the benefits of being part of a software community or cluster, generally depending on the segment of the software industry in which they operate. However we have identified a number of benefits enjoyed by companies that are part of successful clusters as found in the US. These benefits can be summarised as 'reduced interaction costs', i.e., the cost of dealing with and forming relationships with suppliers (of goods and ideas), potential employees, investors, competitors, partners and customers is lower because of geographical proximity.

- There are some software segments where proximity and partnership with companies and academic institutions making technological breakthroughs are advantageous. This is most true for companies operating in the systems infrastructure and applications tools area.

This helps explain the particular dominance of US companies in these segments (Exhibit 19). However it should be noted that it was a 'lucky break' that enabled Microsoft to develop the operating system for IBM PCs, thereby initiating their dominance, not geographical proximity.

- However, in the applications segment, proximity to and understanding of customers is probably more important than locating close to other IT software companies. To quote a London based software entrepreneur: 'There is little point being located in a science park off a motorway when my customers are in the City of London'. Some companies operating in this market do see benefits from clustering, for example locating skills and forming commercial partnerships. However this is not generally considered essential.

- An appropriate supporting infrastructure tends to develop around a successful cluster, e.g., professional service firms. This can facilitate the growth of start-up companies (Exhibit 20). The UK has been less flexible than the US in providing the infrastructure required to support fast growing businesses. For example, in Silicon Valley it is possible to obtain short (one year or less) leases. In the UK the minimum term is often five years. In the US lawyers and accountants often take equity stakes in start-ups in lieu of fees, and flexible contract professionals are readily available. These services also create significant employment, as much as one job for every two software sector jobs.

- Successful companies today form global networks of partners as 'virtual clusters' or webs, which are unrelated to geographical proximity. Companies such as SAP have achieved this very successfully, forming key partnerships with project service firms which have helped build their dominant market position. Increasingly, technology means that firms can exploit the reduced cost of interactions enjoyed by traditional clusters, without geographical proximity.

- Maximum benefit from clustering comes when a critical mass of successful companies in related fields are located together. Without this critical mass clustering has little value and in fact can have a limited or even negative value, for example it may facilitate skill poaching. A Cambridge based company told us 'our location represents little more than a prestigious address…, if anything proximity creates a more competitive market for skills'. The most successful clusters form naturally through market forces. Attempts by governments to create high tech clusters are often driven by the need to create employment, and hence are generally less successful. Governments should focus on removing the barriers to natural cluster formation, rather than artificial intervention. In the UK the expansion of the high-tech community in areas such as Cambridge has been hampered by planning restrictions such as greenbelt regulation.

4. **Links with universities:** Successful software companies in the US often have affiliations with academics who provide technical insights and development stimuli. These links are easy to establish as many US academics have thriving commercial practices. UK universities have been slower to recognise the benefits of strong external links and still approach this in an ad hoc manner. This is due to the fact that UK University funding is based in part on research paper publication, creating a more internal and academic focus. However, although strong links with academia are considered helpful, these were not considered essential by most companies interviewed as part of this study. Most companies interviewed believed that development stimulus was provided more by the demands of leading edge customers than academic research.

   Several US universities have also put in place mechanisms to facilitate the commercial exploitation of research. For example Stanford operates an 'Office of Technology Licensing' for this purpose where royalties are divided, one third to the University, one third to individual departments and one third to academics. Some UK universities are beginning to set up similar mechanisms for high tech sectors, for example the Isis innovation at Oxford.

¶ **Capital markets: nature of UK venture capital market.** In the early stages both UK and US entrepreneurs use a mixture of private funds and bank loans as seed capital. However, further financing is almost always required to support a major expansion, both for product development and marketing costs, for instance when a UK company wishes to penetrate the US market. Software companies can have lead times of up to one year before a revenue stream is generated from a new market, making financing at this stage critical. The UK software industry has historically found it harder to raise capital at this critical stage (Exhibits 21-22). This is because the UK venture capital industry has historically chosen not to focus on this sector for a number of reasons.

- UK venture capitalists lack expertise and knowledge of the high tech sector and are often unsure how to value companies which are yet to establish a steady income stream. In the US, high tech venture capitalists generally have a technical education and background and their key skill is recognising the potential market value of a new technology. UK venture capitalists are generally finance professionals with limited technical knowledge.

- A substantial proportion of UK funds are 'captive funds' (directly linked to pension funds) and require a guaranteed future income stream. In addition 3i, one of the largest venture capital funds and the training ground for many industry professionals, has its roots in the relatively conservative clearing banks. UK venture capitalists also experienced low returns from start-up investments in the 1980s and have shifted their attention to more lucrative investments, for example MBOs (Exhibit 23).

- Historically there has been low demand from entrepreneurs in the software sector for funds, so this has not stimulated the development of a high tech venture capital sector. In addition many of the strongest UK companies today seek funds in the US. This is because US high tech venture capitalists act as a valuable and influential board member for start-up companies, helping in areas such as recruitment and marketing. For UK companies this 'insider help' is particularly important in penetrating the US market. Association with a high profile US fund also lends customer credibility to start-up companies.

- US start-up companies have in recent years found it relatively easy to raise capital, with the entire process taking as little as a few weeks. None of the US companies interviewed described raising capital as a barrier to growth, in contrast to the UK companies. The degree to which US venture capitalists subsequently help companies in other ways, through their extensive networks of contacts, varies according to each company's needs.

- A prerequisite for venture capital funding is a robust business plan. Our interviews suggest that many UK high tech companies may lack the management skills required to develop this in the early stages.

- The next stage on from venture funding is generally a public listing. NASDAQ has become recognised as the global market for software companies, providing both the highest valuations and the most liquidity (Exhibit 24). US customers view NASDAQ listing as a mark of credibility and the best US employees insist on NASDAQ stock options. The US venture capital system is entirely geared up to carrying companies towards a NASDAQ flotation, which is again an attractive proposition for UK companies. The strength of NASDAQ, together with the size of the US market leads many UK based companies to shift their centre of gravity to the US. Interestingly a lot of NASDAQ investment in high tech companies comes from Europe, indicating no inherent unwillingness to invest in high tech industries.

- However, a lack of venture capital for expansion into new markets need not always be a barrier for companies. Certain companies, notably Microsoft, have expanded rapidly by developing low cost distribution channels via partnerships with hardware manufacturers. Additionally, there is evidence that UK venture capitalists are starting to show greater interest in the high tech sector. A number of funds have recently been set up to foster the growth of high tech start-ups (Exhibit 25), and US venture funds are starting to look for overseas opportunities, as available funds exceed high quality demand in the US.

¶ **Product regulations: planning and building regulations:** As mentioned earlier, planning regulations, particularly in the Cambridge area, have restricted the expansion of high tech clusters. Successful clusters will only form if entrepreneurs are allowed to locate where they need to be i.e., where critical supply and demand side factors reinforce each other.

¶ **Country specific factors: less visible entrepreneurial culture:** Although it is difficult to quantify, there seems to be a less visible entrepreneurial culture in the UK than in the US. This limits the availability of role models to inspire others. Indeed, entrepreneurs like Clive Sinclair are often portrayed by the UK media as eccentrics. In contrast, successful entrepreneurs in the US are given positive publicity. For example, magazines such as Red Herring, Upside and Wired contain a constant stream of features on successful entrepreneurs. The strength of the US economy has also inspired a greater confidence amongst the US population. The price of failure (by accident rather than design) is low due to flexible and forgiving employment markets, coupled with a high demand for talent. In addition, in the US the availability of flexible contract staff and professional service firms, who will often take payment in share options, means that new companies require only limited seed capital.

Output performance

For the sector as a whole, the output gap is driven by lower consumption in the UK in all three sub sectors. The reasons for low consumption of IT by the business sector (which is responsible for over 90 per cent of consumption) were discussed earlier under '*Other industries, up and downstream*: *Demand from local leading edge customers*' and are the same for the services sectors as for packaged software. In addition, low output in the packaged software sector is driven by the UK's very negative trade deficit with the US (Exhibit 26). The reasons for the US dominance in the global packaged software market have also been explained in the previous sections of this report.

FUTURE OUTLOOK AND RECOMMENDATIONS

In spite of the current performance gap, the UK software sector should be viewed as a key area where the UK has the ability to grow both output and employment. The UK possesses several industry sectors, for example retail and financial services, which have a leading edge appetite for IT and could provide the necessary stimulus to grow a globally successful software company. The UK is also recognised as a source of high quality IT skills, by US companies that have established development centres here. Expansion into the US market should also be facilitated by a shared language and the presence of many US transplant operations in the UK.

The key message emerging from this case is that successful high tech industries are most likely to emerge where there is both early leading edge demand and an appropriate and flexible infrastructure to support rapid growth.

¶ **Leading edge demand:** As the UK wholesale banking sector demonstrates, leading edge demand is most likely to come from sectors which are relatively deregulated and also highly competitive. Therefore policy makers should focus on promoting widespread deregulation and competitive intensity. This will not only improve productivity directly in industry sectors but also create greater demand for technology such as software to further increase productivity. For example if demand per capita for project and processing services in the UK rose to US levels, up to 75,000 high value jobs could be created in the UK, each earning up to 60 per cent above the average wage level. Greater economic wealth in the economy at large will provide firms with additional output to invest in IT.

The government might also consider removing the bureaucracy and cost surrounding the commercialisation of government funded projects. For example, in the US products are marketed at replication cost rather than at full cost recovery as in the UK.

In addition, software companies should work hard to stimulate demand by educating customers on commercial applications for technology. For example, ‘Internet entrepreneurs’ in the US build their business by identifying ways in which the Internet could benefit a sector and then selling the idea to customers.

UK companies should focus their efforts on those segments where the US first mover advantage is less important and market share position less dominant, such as business applications software. Within this segment there remain a number of vertical markets where no single dominant player has yet emerged e.g., retailing software.

¶ **Global marketing:** The government should promote UK success stories abroad to inspire confidence in the UK industry. One possibility might be to develop a commercial support centre or embassy for UK companies in Silicon Valley, which could help companies secure finance and develop commercial partnerships. Another possibility might be to 'twin' start-up UK companies with UK entrepreneurs already successful in the US, an idea which is currently being developed in The Netherlands. Software companies should develop global alliances at an early stage to facilitate expansion into overseas markets.

¶ **Supporting infrastructure:** Action also needs to be taken to minimise infrastructural barriers.

- **Venture capital:** The UK either needs to grow its own high tech venture capital industry or use that already developed in the US. As mentioned earlier, high tech venture capitalists generally have a technical background themselves. Exhortations to the traditional venture capital industry in the UK, which lacks many of the required skills, are unlikely to be successful. Ideas such as a trade embassy in Silicon Valley or 'twinning' could improve access to the US venture capital sector for UK entrepreneurs. As high quality demand for venture capital increases in the UK, a domestic sector should grow, as is already apparent from the recent growth in high tech funds. Companies such as Oracle, that have established UK operations, should be encouraged to act as industrial venture capitalists, spinning off start-up companies as they do in the US.

  Europe lacks an exit market for start-up companies to rival NASDAQ. However NASDAQ is now recognised as the global market for high tech companies, offering the highest valuations and the greatest liquidity. Considerable efforts have been made to create a European market of similar strength. As access to NASDAQ is open to European companies, this effort could be misplaced.

- **Clusters:** Government support for high tech clusters in the UK has had limited success. It is likely that clusters will always be more successful when they evolve naturally due to market forces. Government should therefore focus its efforts on removing barriers to natural cluster formation, such as planning regulations. At the same time software companies should focus on developing global networks of partners and not rely on geographical proximity.

- **Universities:** Universities should look to exploit their research work externally and commercially to a much greater extent. In a healthy industry, as found in the US, universities and software companies feed off each other, one supplying ideas and talent, the other providing jobs for graduates and funding. In addition universities should address the content of courses to develop more potential high tech entrepreneurs. For example, IT courses could have a greater business content, focusing on key start-up skills such as business planning. Business courses could have high tech elements, promoting the success stories and the rewards of entrepreneurship.

Appendix: Methodology for productivity calculations

To compare the performance of the UK software sector with that of other countries we investigated output, labour inputs and labour productivity.

¶ **Output:** Output was calculated using international packaged software spending (consumption) figures from IDC, which includes retailer margins. We then corrected consumption figures for estimated trade flows between the major global regions, North America, Europe and Asia Pacific. All country figures were then made comparable using OECD GDP PPPs. For project and processing services we assumed that consumption and production were co-located.

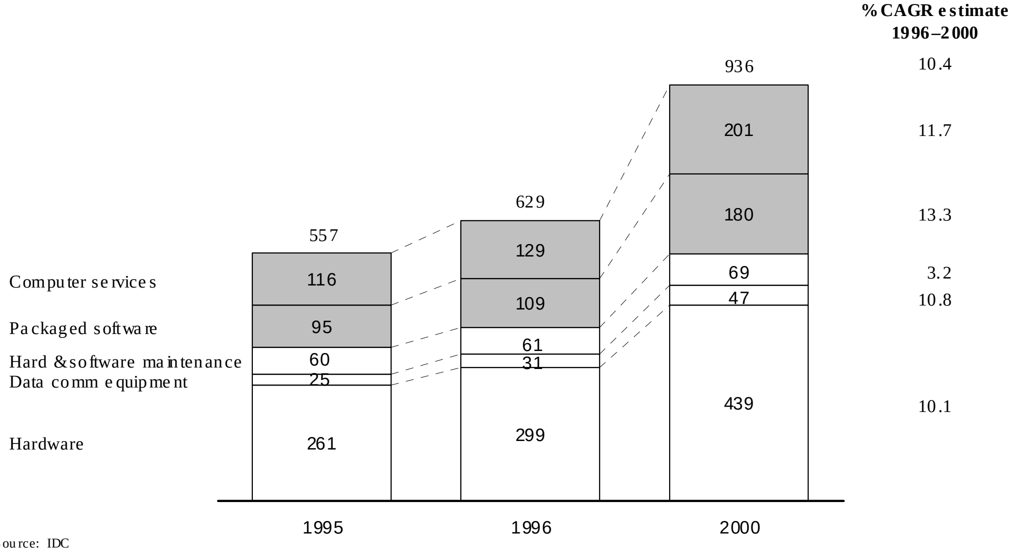
¶ **Labour productivity:** Labour productivity was estimated using a sample of representative companies for each of the countries studied. We chose this method because there are no consistent sources that give both output and employment figures at the country aggregate level. We estimated value added per employee by using world-wide sales per employee as a proxy. For packaged software we used global figures and therefore we did not need to correct for purchasing power differences. For project and processing services we used domestic sales divided by domestic employees and then applied OECD GDP PPPs.

¶ **Labour inputs:** Labour input was derived from the above two calculations. There are no national employment statistics which separate out the three sectors. Even within the computer services employment data, companies are not consistent in their classification.

Exhibit 1

COMPUTER INDUSTRY WORLDWIDE MARKET SIZE BY SECTOR

$b



Source: IDC

Exhibit 2

SOFTWARE MARKET SEGMENTATION, 1996

(Each cell: 96 sales $b / 95–96 % growth)

Hardware Environment ← Most concentrated; *Software type* ↑ Most concentrated

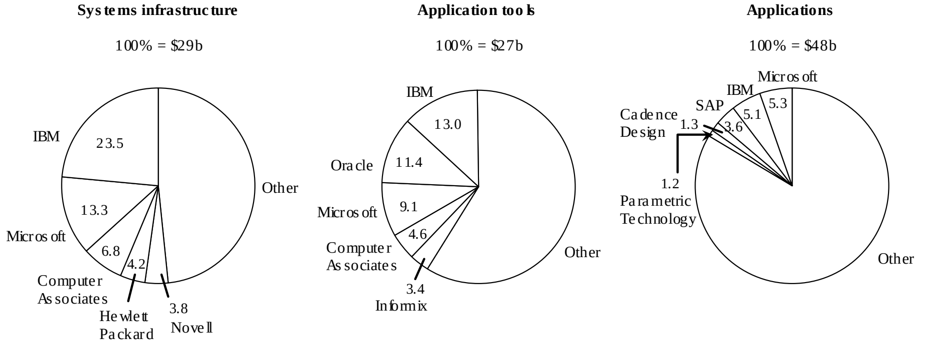
Software type	Mainframe	Network server	Desktop/PC
Systems software	13.5 / 6.3	8.9 / 39.0	7.7 / 9.9
Application tools	9.4 / 0.4	8.0 / 11.3	10.0 / 3.8
Applications	14.2 / 3.4	11.4 / 35.2	22.2 / 6.9
U.S. share of global market	**89**	**88**	**64**

Source: IDC

Exhibit 3

PACKAGED SOFTWARE WORLDWIDE MARKET SHARE, 1996

%



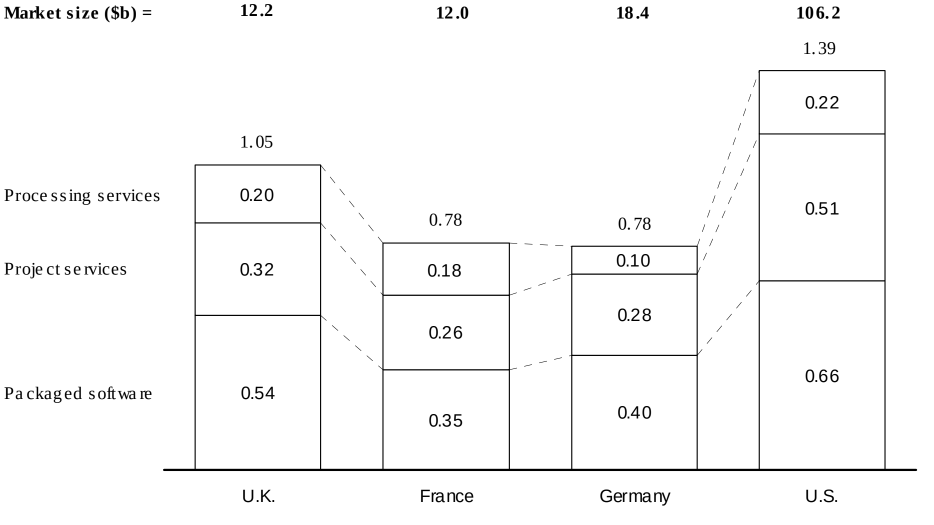
	Systems infrastructure	Application tools	Applications
Top 5 players % share	**51.6**	**41.5**	**16.5**

Source: IDC

Exhibit 4

CONSUMPTION OF SOFTWARE AND SERVICES – COUNTRY COMPARISONS

% GDP*, 1996



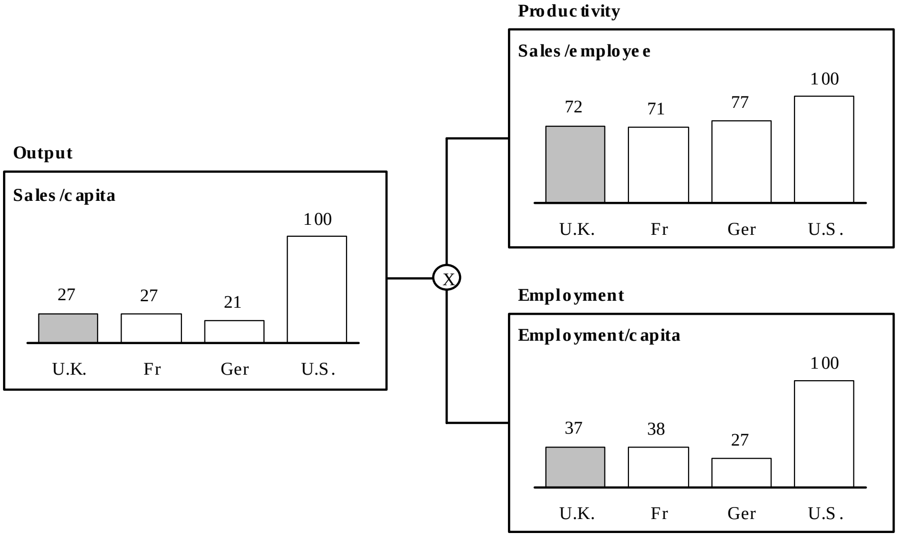
* Converted at 1996 average U.S.$ FX

Source: IDC

Exhibit 5

SOFTWARE AND SERVICES, PRODUCTIVITY COMPARISON

1996, Indexed to U.S. = 100

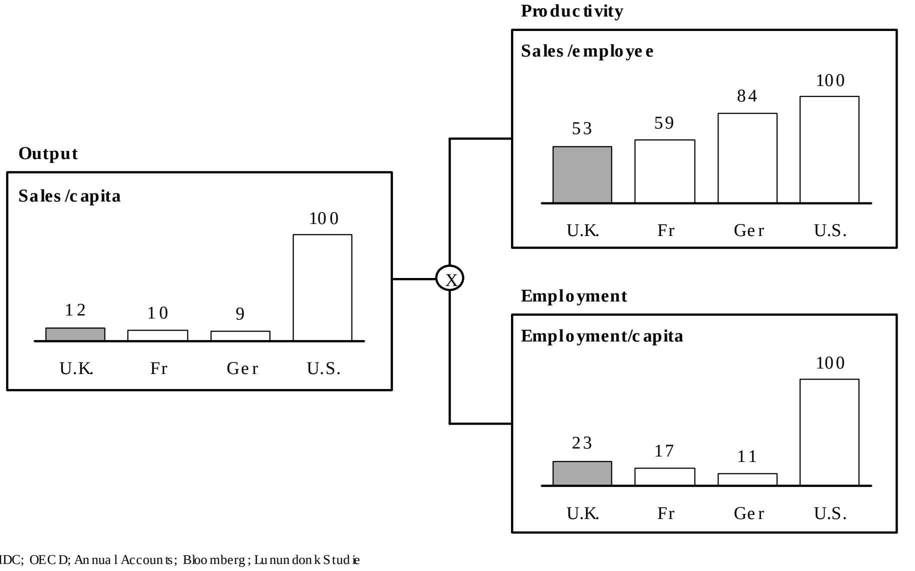


Source: IDC; OECD; Annual Accounts; Bloomberg; Lunundonk Studie

Exhibit 6

PACKAGED SOFTWARE, PRODUCTIVITY COMPARISON

1996, Indexed to U.S. = 100

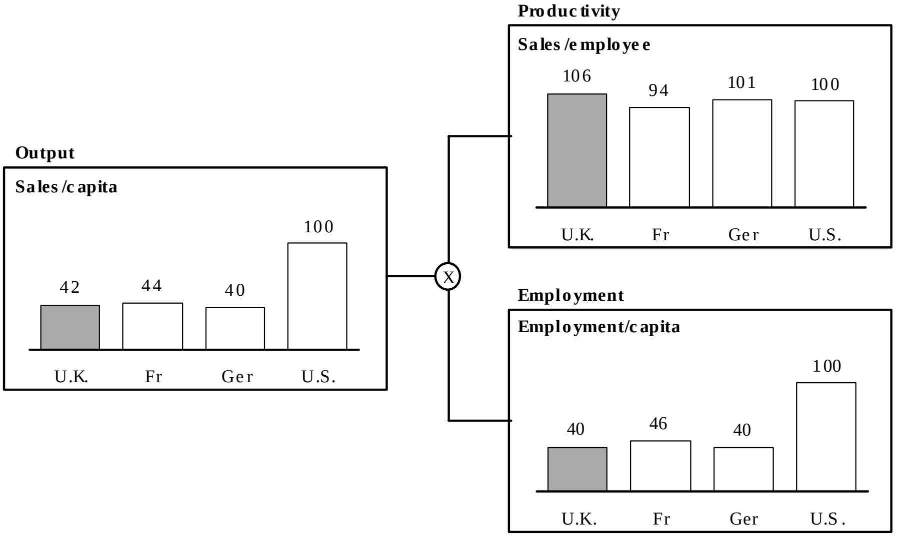


Source: IDC; OECD; Annual Accounts; Bloomberg; Lunundonk Studie

Exhibit 7

PROJECT SERVICES, PRODUCTIVITY COMPARISON

1996, Indexed to U.S. = 100

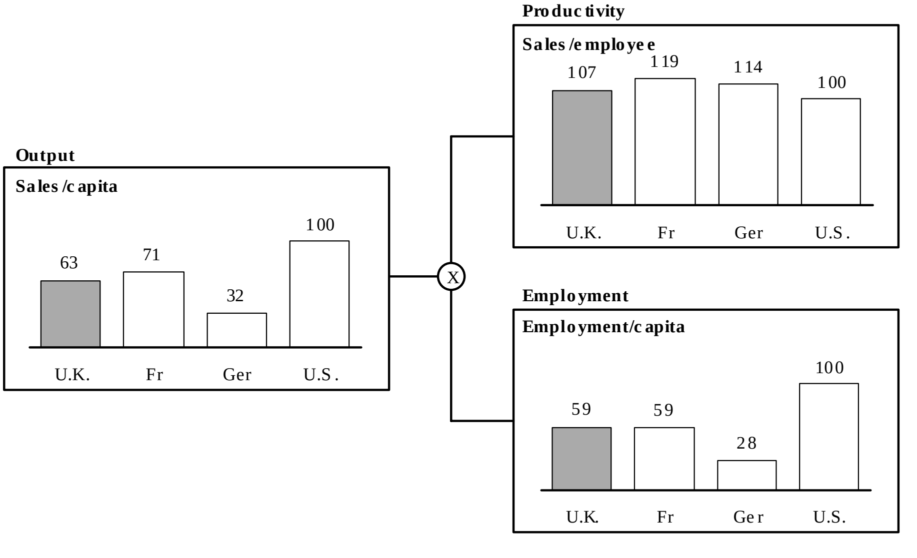


Source: IDC; OECD; Annual Accounts; Bloomberg; Lunundonk Studie

Exhibit 8

PROCESSING SERVICES, PRODUCTIVITY COMPARISON

1996, Indexed to U.S. = 100



Source: IDC; OECD; Annual Accounts; Bloomberg; Lunundonk Studie

Exhibit 9

CAUSALITY FOR LABOUR PRODUCTIVITY DIFFERENCES

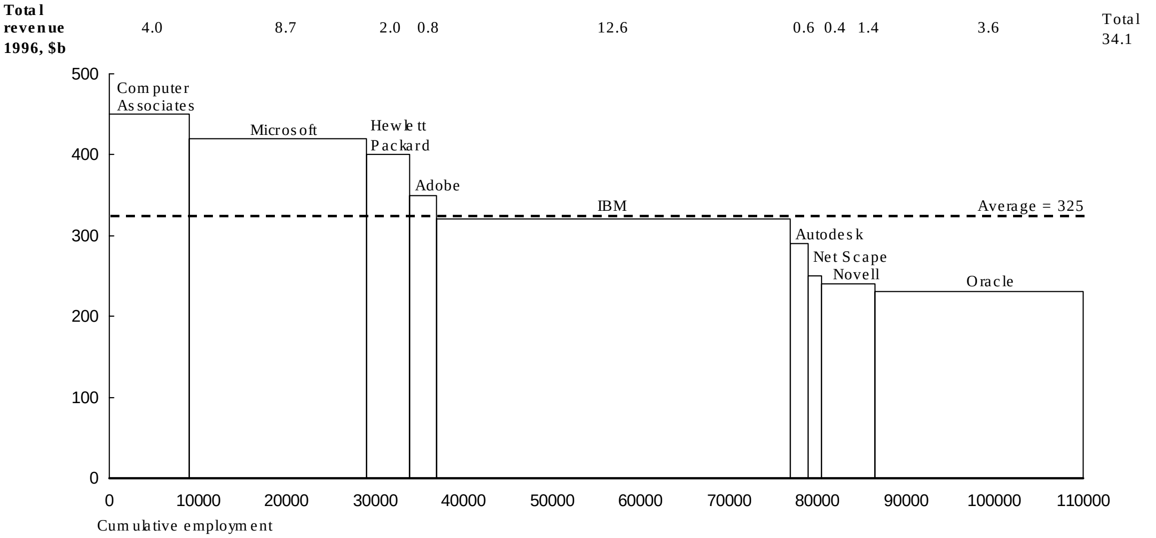
● Important (>10 points of gap)
○ Secondary (3-10 points of gap)
- Undifferentiating (<3 points of the gap)

		U.K. vs. U.S.
External factors	• Fiscal and macroeconomics environments	-
	• Product market	
	– Trade/FDI barriers	-
	– Product regulations	○
	• Labour market	
	– Labour rules/unionism	-
	– Relative labour cost	-
	– Education	-
	• Capital market	
	– Corporate governance/government ownership	-
	– Access to capital	●
	• Other external factors	
	– Other industries/up and down stream	●
	– Country specific factors	○
Industry dynamics	• Competition with best practice	-
	• Domestic competitive intensity	-
Production process	• Mix of products and services/marketing	
	– Product category mix	○
	– Value added within category	●
	– Product proliferation	-
	– Pricing structure/marketing	-
	• Production factors	
	– Capital intensity/technology	-
	– Scale	●
	– Front line skills/trainability	○
	– Matching capacity to demand	-
	• Operations	
	– Organisation of functions and tasks	-
	– Design for manufacturing	-
	– Suppliers and supplier relationships	-
	Productivity performance (comparison country = 100)	72

Exhibit 10

LARGEST AND MOST PRODUCTIVE U.S. SOFTWARE COMPANIES, 1996

Revenue per employee, $000

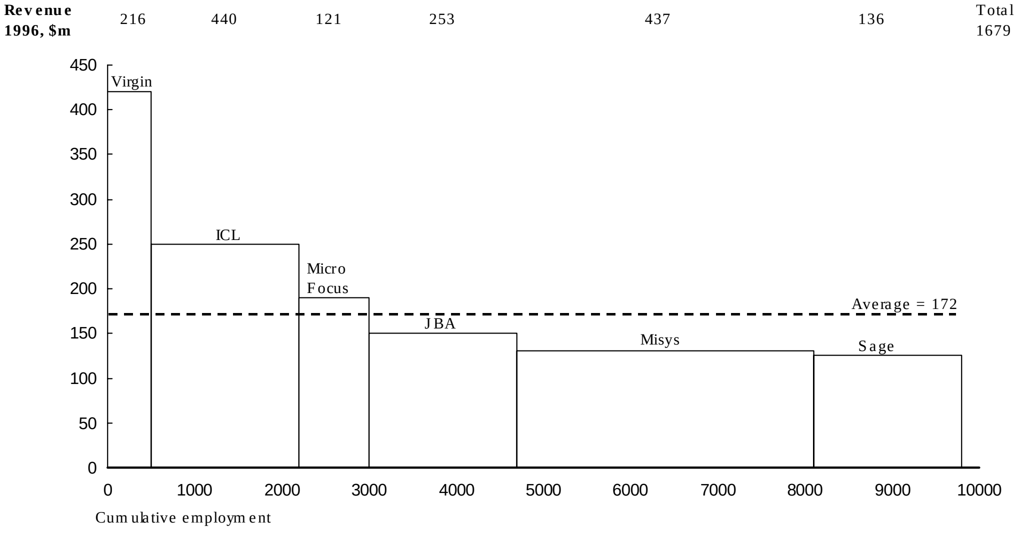


Source: IDC; Annual Accounts

Exhibit 11

LARGEST AND MOST PRODUCTIVE U.K. SOFTWARE COMPANIES, 1996

Revenue per employee, $000

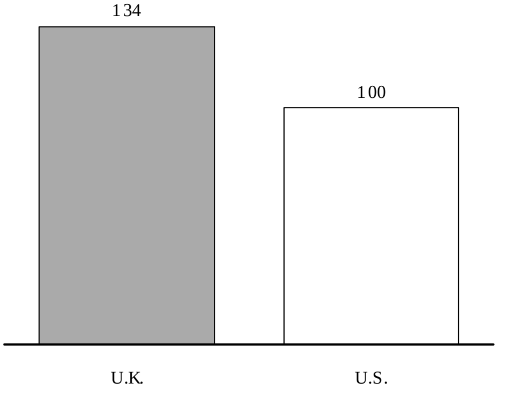


Source: IDC; Annual Accounts

Exhibit 12

IT GRADUATES IN THE U.S. AND U.K., 1995

Graduates/capita, Indexed to U.S. = 100

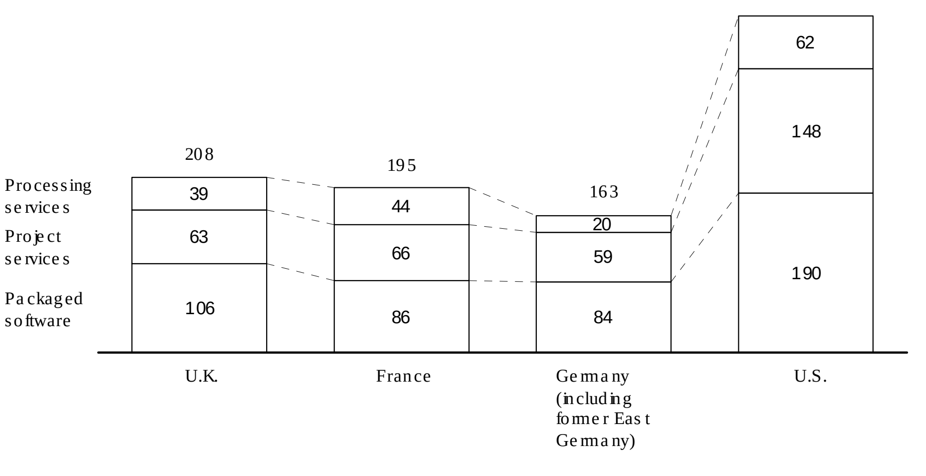


Source: Government data on university graduations

Exhibit 13

CONSUMPTION OF SOFTWARE AND SERVICES, 1996

$/capita

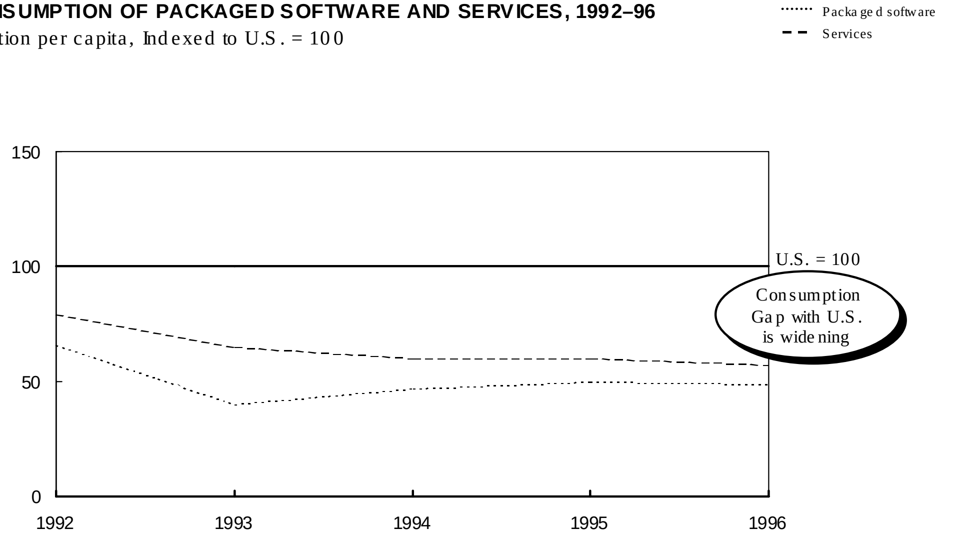


Source: IDC

Exhibit 14

U.K. CONSUMPTION OF PACKAGED SOFTWARE AND SERVICES, 1992–96

Consumption per capita, Indexed to U.S. = 100



Source: IDC

Exhibit 15

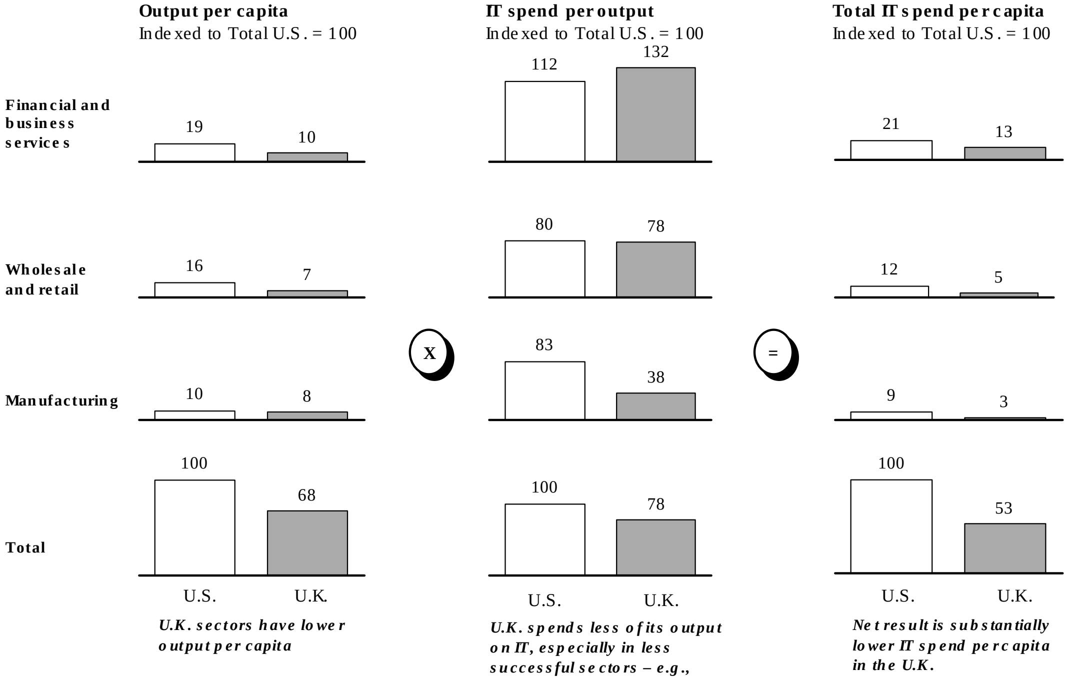
U.S. SOFTWARE INDUSTRY RESPONSE TO LEADING EDGE DEMAND – EXAMPLES

Software company	Comment
HBO &Co. (Founded 1974)	• Demand from U.S. healthcare industry for more efficient and cost effective patient information and hospital administration led to its first product, MedPro • HBO & Co. has since expanded its services to hospitals and now serve 52% of U.S. hospitals with total sales of $1.2b in 1996 • Company is well placed to take advantage of international healthcare opportunities
Adobe (Founded 1982)	• Demand for a computer language to transmit complex text and images to a printer, Adobe created PostScript which became the industry standard • As desktop publishing grew, Adobe created leading products like Illustrator (1987), Photoshop (1989) and, most recently, Acrobat (1993) for electronic documents • Sales $786m in 1996
Cadence Design (Merger of SDA and ECAD in 1988)	• Demand from leading U.S. electronics companies for ever more complex integrated circuits led to Electronic Design Automation software • Cadence is now leader in EDA with sales of $916m
Vantive Corp (Founded 1990)	• Increased competition to retain customers and improve customer service led Vantive to develop front office automation software called Customer Asset Management. First product launched in 1992 • Now has over 500 customers, is expanding internationally and has grown from $10m in 1994 to $64m in 1996

Source: Web sites; text lines; McKinsey analysis

Exhibit 16

SOURCES OF IT CONSUMPTION* GAP BY SECTOR



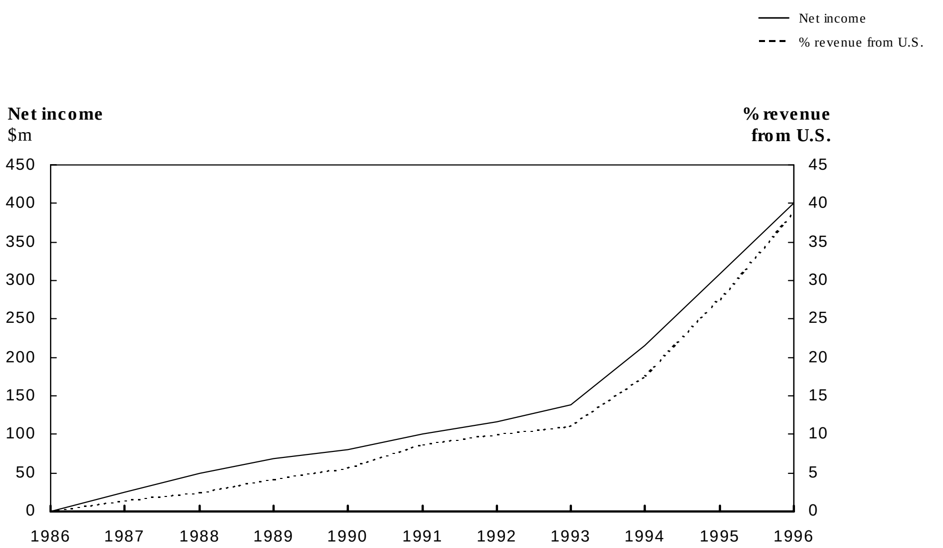
* Includes hardware and software

Source: Gartner Group; IDC; OECD; National Accounts

Exhibit 17

NET INCOME AT SAP AND U.S. MARKET PENETRATION

ILLUSTRATIVE

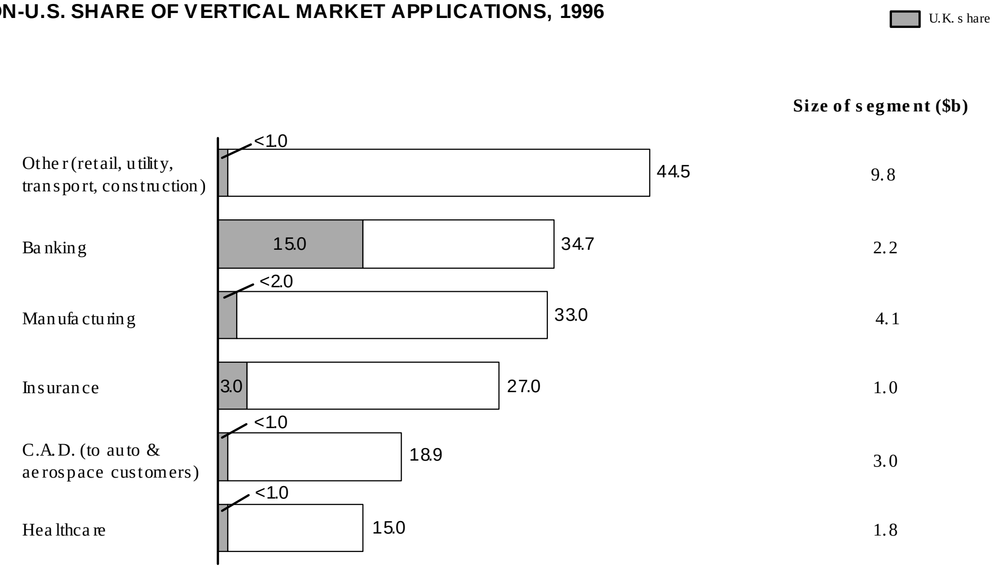


Source: McKinsey Software Review

Exhibit 18

NON-U.S. SHARE OF VERTICAL MARKET APPLICATIONS, 1996

%

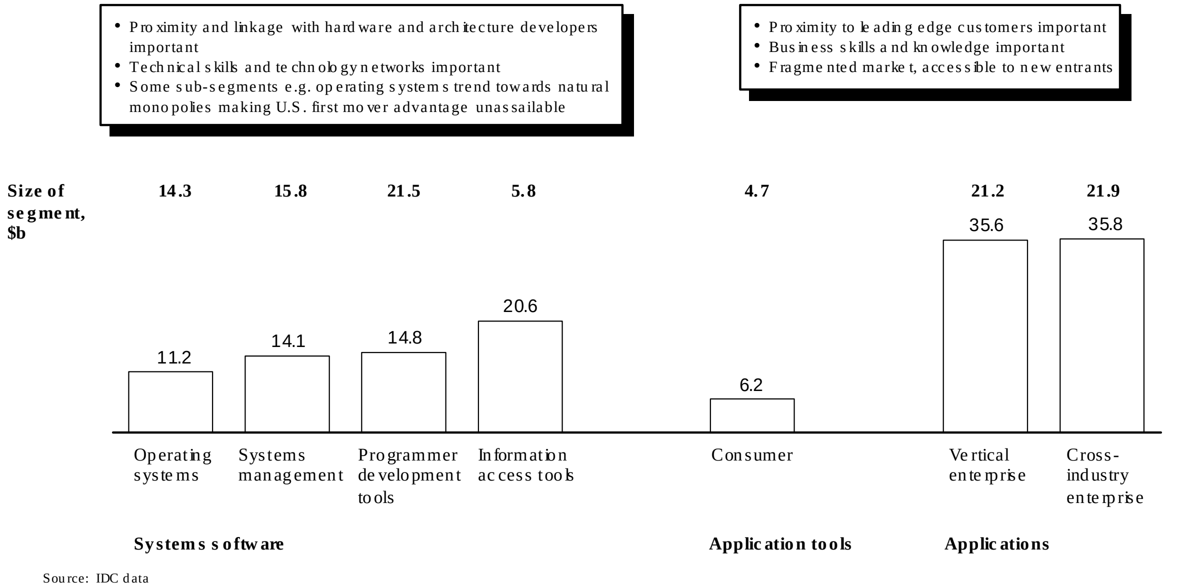


Source: IDC

Exhibit 19

NON U.S. SHARE OF PACKAGED SOFTWARE SUBSEGMENTS

%



Source: IDC data

Exhibit 20

SILICON VALLEY INFRASTRUCTURE AND SERVICES

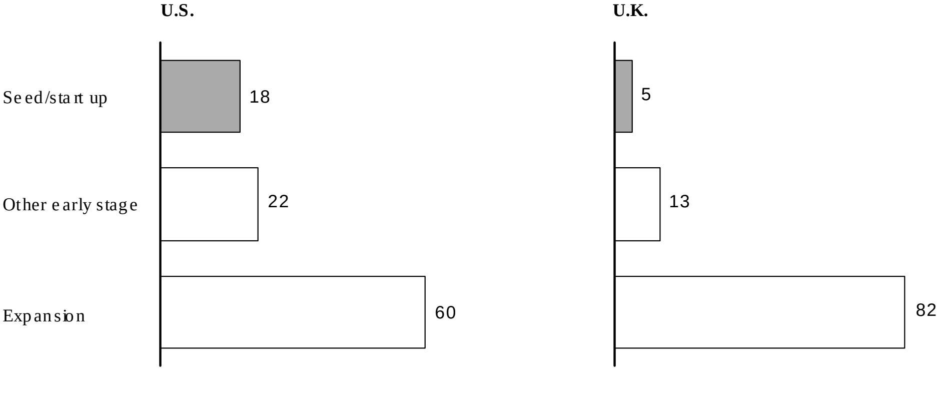
	Employment 000, 1996	**% CAGR, 1992–96**	**Examples**
Innovation services	74.5	7.2	Contract programming, testing services, specialist manufacturers
Professional services	94.9	14.8	Accountants, lawyers, venture capitalists, recruitment consultants
High tech companies	256.7	6.0	Biotech, computers, semiconductors, communications, software, aerospace

Source: Collaborative Economics; Joint Venture Silicon Valley

Exhibit 21

VENTURE CAPITAL INVESTMENTS BY STAGE*

% total, 1996



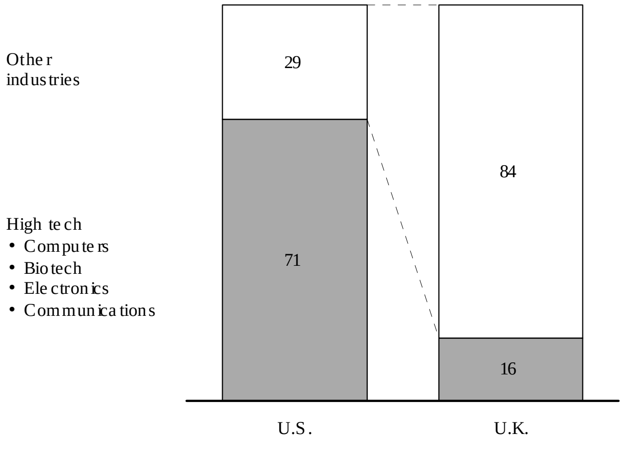
* Excludes MBO activity

Source: Venture Economics Review; BVCA

Exhibit 22

VENTURE CAPITAL INVESTMENT IN HIGH TECH: U.S. VS. U.K.

% $ invested, 1996

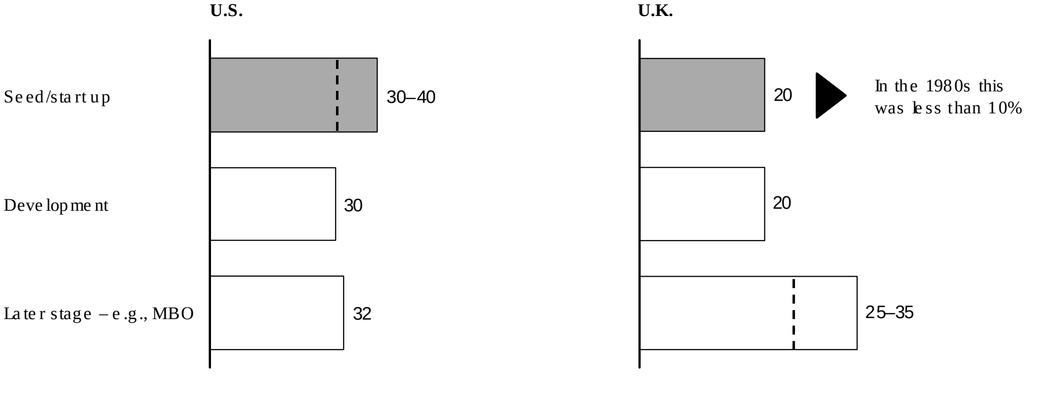


Source: Venture Economics Review; BVCA

Exhibit 23

IRR OF VENTURE CAPITAL INVESTMENTS U.S. VS. U.K.

% after 3 years, average



Source: Venture Economics Review; BVCA

Exhibit 24

MATURITY OF SMALL BUSINESS STOCK EXCHANGES

	U.S.	U.K.	Europe	
	NASDAQ	AIM	EASDAQ	Euro NM
Started	1971	1995 (formerly USM)	1996	1997
No. of companies	5,070	300	23	47
Computer related	560	30 est.	6	n/a
Market capitalisation 31 December 1997, $b	1,653	9.1	5.1*	4.6**

* As at 21 November 1997
** As at August 1997

Source: Web sites; FT; BVCA

Exhibit 25

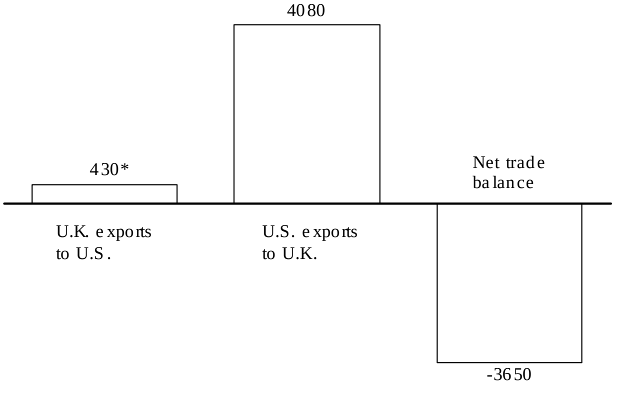
RECENT U.K. HIGH TECH FUNDS

Name	Description
Kennet Capital	Joint venture with U.S. Broadview Associates and Electra Fleming. £47m fund to invest in IT in U.K. and rest of Europe
Apax Partners	£100m fund to invest in IT over 3 years
Amadeus	£16m fund backed by Microsoft, intends to invest in 15–20 companies
Scottish Enterprise	£25m fund created from private investors
Technology Investments at 3i	Invested £115m in first 10 months of 1997

Exhibit 26

TRADE BALANCE BETWEEN THE U.K. AND U.S. IN PACKAGED SOFTWARE

$m



* Estimate based on U.K. share of non-U.S. supplied software

Source: IDC data

Driving Productivity and Growth in the U.K. Economy

McKinsey
Global
Institute

with assistance from our Advisory Committee
Bob Solow, Chairman
Ted Hall
Stephen Nickell

October 1998

McKinsey Global Institute

The McKinsey Global Institute was established in 1990 as an independent research group within McKinsey & Company, Inc. to conduct original research on important global issues. Its primary purpose is to develop insights into global economic issues and reach a better understanding of the workings of the global economy for the benefit of McKinsey clients and consultants.

From time to time the Institute issues public reports. These reports are issued at the discretion of the Institute's Director and its McKinsey Advisory Board, when they conclude that the Institute's international perspective and its ability to access McKinsey's knowledge of industry economics enable it to provide a valuable fact base to policy debates. The McKinsey Advisory Board is made up of McKinsey partners from Europe, the Pacific Basin and the Americas.

The staff for the Institute are drawn primarily from McKinsey's consultants who serve 6-12 month assignments and then return to client work. The Institute also commissions leading academics to participate in its research. The Institute's Director is William Lewis, a McKinsey partner. The Institute is located in Washington, D.C.

Contents

Preface

This report is an end product of a year long project by the McKinsey Global Institute, working closely with members of McKinsey's London office, on the economic performance of the United Kingdom.

McKinsey undertook this project as an important step in developing our understanding of how the global economy is working. We also thought it would be important to resolve the paradox of why, if the US and the UK both have "Anglo- Saxon" economies, their economic performance is so different. We have undertaken this work as an investment by McKinsey in knowledge building, and of course, are solely responsible for the results.

This project builds upon the previous work of the McKinsey Global Institute in assessing economic performance among the leading economies of the world. Our earlier reports addressed separately labour and capital productivity and employment[1], the fundamental components of economic performance. Later, we combined these components to address the overall performance of Sweden, Australia, France, Germany, the Netherlands, Brazil and Korea[2]. In all countries, economic performance is compared with the US, and in some countries with Japan. This study continues our efforts to assess economic performance at the country level.

As before, the core of our work is conducting sector case studies to measure differences in productivity, output and employment performance across countries and to determine the reasons for the differences. This work provides the basis for our conclusions about how to increase productivity and output levels in the UK.

This report consists of four chapters and an executive summary. Chapter 1 describes our project objectives and approach. Chapter 2 describes our analysis and conclusions at the aggregate level. This chapter provides our conclusions about what can be learned from aggregate level analysis and what questions need to be addressed at the sector case study level. Chapter 3 comprises the six sector case studies: automotive, processed food, food retailing, hotels, telecommunications, and software. Each case starts with a short executive summary, and then gives the results of our productivity calculations and discusses the reasons for the differences we found between the UK and benchmark countries. Chapter 4 presents the synthesis of our findings including our overall conclusions about the economic performance of the UK and how to improve it.

A core team of six consultants from McKinsey's London office and four consultants from the McKinsey Global Institute participated on the working team for this project at various times. The London based consultants were Michaela Ballek, Claire Craig, Vicki Harris, Bruce Levi, Helen Mullings and Iain Osborne. The Global Institute consultants were Scott Anthony, Denis Bugrov, James Kondo, and Vincent Palmade. In addition, Jaana Remes, a McKinsey Global Institute economics research specialist, participated in the aggregate analysis and synthesis. Administrative support was provided by Gretchen Bossert, Ronni Brownlee, Leslie Hill Jenkins and Joanne Stewart.

1 *Service Sector Productivity*, McKinsey Global Institute, Washington, D.C., October 1992; *Manufacturing Productivity*, McKinsey Global Institute, Washington, D.C., October 1993; *Employment Performance*, McKinsey Global Institute, Washington, D.C., November 1994; *Capital Productivity*, McKinsey Global Institute, Washington, D.C., June 1996.

2 *Sweden's Economic Performance*, McKinsey Global Institute, Stockholm, September 1995; *Australia's Economic Performance*, McKinsey/Australia and McKinsey Global Institute, Sydney, November 1995; *Removing Barriers to Growth in France and Germany*, McKinsey Global Institute, March 1997; *Boosting Dutch Economic Performance*, McKinsey Global Institute and Max Geldens Foundation for Societal Renewal, September 1997; *Productivity-The Key to an Accelerated Development Path for Brazil*, McKinsey Brazil Office and McKinsey Global Institute, Sao Paulo, Washington, March 1998; *Productivity-led Growth for Korea*, McKinsey Seoul Office and McKinsey Global Institute, Seoul, Washington, March 1998.

Vicki Harris was responsible for day-to-day management of the project, withVincent Palmade leading the analytical work during the synthesis phase. The project was conducted under the direction of Simon Fidler. Oversight of the project was provided by Nick Lovegrove and myself, assisted by Martin Baily.

In carrying out the work we were fortunate to have an external Advisory Committee. This was chaired by Professor Robert Solow of MIT, and also included Professor Stephen Nickell of LSE and Ted Hall, Chairman of the McKinsey Global Institute Advisory Board. The working team had four all-day meetings with the Advisory Committee to review progress during the course of the project and benefited from many written comments and individual discussions.

Throughout the project we benefited from McKinsey consultants' unique worldwide perspective on and knowledge of the industries investigated in our case studies. This knowledge has been developed through work with clients and investment in understanding industry structure and behaviour to support our client work. McKinsey sector leaders provided input to our case studies and reviewed our results. McKinsey's research and information departments provided invaluable information and insight under very tight time constraints.

Finally, we could not have undertaken the work without the information received in our numerous interviews with corporations, industry associations, government officials and others. We thank all the individuals concerned for their time and help but would stress that we are solely responsible for the results. We would also emphasise that the work is independent and has not been commissioned or sponsored in any way by any business, governmental or other institution.

Bill Lewis
Director of the McKinsey Global Institute
October 1998

Appendix: Detailed Methodology and Results for the Output Gap Analysis with the US at the Sector Level

This Appendix presents the methodology and results of the output gap analysis with the US at the sector level. It illustrates in particular how greater productivity should translate into higher output through both direct and indirect effects.

Exhibit A1 summarises our methodology for explaining the output gaps between the UK and the US for the six studied sectors. Exhibits A2 to A7 present our detailed results and rationales for each of the studied sectors.

The US has been chosen as our output benchmark country because it has more than 20 per cent more output per capita in the market economy than in any other large OECD country. One could argue that there is no particular reason for the UK to have similar levels of output as the US in one particular economic sector as countries vary in terms of specialisation and preference. We nevertheless believe that, because our sectors are both individually big and collectively representative of the market economy, understanding the output gaps at this level should help explain the output gap at the aggregate level. Indeed, the average output gap across our sectors is remarkably close to the overall output gap between the UK and the US in the market economy.

DECOMPOSITION OF THE OUTPUT GAP

There are four main factors which can cause differences in output per capita at the sector level.

¶ First, we isolate the impact on output of regulations leading to a lower level of total factor productivity in the studied sector. All else being equal, a lower level of total factor productivity (TFP) - labour productivity is used when TFP is not available - results in a lower output because of higher relative prices and/or less attractive features for both domestic and foreign customers. For example, the fact the UK has a very low productivity in hotels makes the price of a hotel night relatively expensive and thus depresses demand. Similarly, uneconomic pricing of local telephone calls leads to lower usage (i.e., output) in the telecommunications sector.

¶ Second, there might be country specific factors which can impact the supply of and/or the demand for specific products and services. For example, adverse weather conditions may affect tourism and thus hotel consumption in the UK relative to the US. Similarly, differences in consumer preference lead to higher consumption of milk in the UK. Differences in tax regimes can also lead to different relative prices. At the overall economy level tax effects should compensate each other.

¶ Third, we have isolated the impact of lower labour inputs in the UK due to differences in labour market conditions (e.g. more generous disability schemes and incentives for early retirement) and possibly different labour/leisure tradeoffs. All else being equal, lower labour inputs lead to lower overall income/output.

¶ Finally, the output of one sector may be affected by the regulations affecting the performance of the other sectors. This can happen in three different ways:

- Regulations in other sectors can lead to lower productivity in the studied sector. For example we have seen that the productivity of the UK software sector is affected by a lack of leading edge customers caused by regulations limiting the spread of global best practice.
- Regulations affecting the productivity of upstream and downstream sectors will depress the demand for the goods of the studied sector by leading to higher final prices to the consumer. For example poor performance in the UK construction industry increases the cost of building new hotels and so leaves the UK hotel stock relatively old and inefficient.
- Regulations affecting the productivity of non related sectors may also affect output by reducing the disposable income to be spent on the goods of the studied sector.

ESTIMATING EACH COMPONENT OF THE OUTPUT GAPS

The methodology we have used to quantify the output foregone as a result of each of these factors is essentially based on income/price demand sensitivities relying in particular on the experience of other countries.

¶ The impact on output of regulations directly affecting productivity in the studied sectors has been estimated based on price/demand sensitivities. The estimate is based on the premise that higher total factor productivity should lead to lower prices everything else being equal (i.e., factor costs and profit margins). We also took into consideration the share of the studied sector in the total value to the customer of the product/service. For example:

- In automotive, we have estimated that regulations directly affecting productivity (i.e. EU quotas and tariffs, weak corporate governance and obstructive labour unions) have led to 30 per cent lower total factor productivity. Studies have revealed that the price/demand sensitivity is around one in this sector and the share of the studied sector in the total value of a car is around 60 per cent (the remaining 40 per cent include raw materials, distribution and purchased services such as advertising). Thus the output impact of these regulations is estimated to be around twenty percentage points (30%*60%*1). We then allocate these output points to the product/capital/labour factors pro rata to their estimated respective impact on productivity. For traded goods we must also take into consideration the combined impact of higher productivity and lower trade barriers. We do this by comparing the relative trade balance of the UK with the benchmark country. In the case of automotive, the net effect is actually negative for output since the US (which is not the global benchmark country for automotive) has a higher trade deficit than the protected UK (Exhibit A2).

- In telecommunications, uneconomic pricing has led to less demand for local calls. In order to disentangle the pricing from the income effect, we have looked at the telecommunications usage in Sweden, which has a similar income per capita as the UK yet enjoys close to economic pricing in telecommunications (Exhibit A6).

¶ The impact of country specific factors is the sum of two factors. Firstly and in a similar way to that described above, we measure the output impact of country specific factors affecting productivity (e.g. more diverse consumer preference in Europe leading to lower scale of biscuit production). Secondly, on the demand side, we look for different consumption patterns (after adjusting for different levels of relative prices and income levels). For example in the case of hotels, we compared the output of France and the UK (having similar income levels) and subtracted from the French output the estimated impact on output of higher French productivity. The residual difference can be attributed to country specific factors such as the British weather (Exhibit A5).

¶ The impact of aggregate lower labour inputs on each sector output is estimated using sector specific income/demand elasticity. We have estimated that the 17 per cent lower labour input per capita in the UK relative to the US results in about 8 per cent lower income per capita. This is based on the premise that the precluded hours have a productivity equal to 70 per cent of the current UK average, equivalent to 50 per cent of the US average labour productivity level (see the output gap analysis section of the Synthesis Chapter). We estimate the sector specific income / demand elasticity by observing how the output of the sector has increased in the US as GDP increased. For example, the output in food processing has increased at a much lower rate (0.3) than the output in hotels (1.5). This approach cannot be used in the case of software. This is because it is a recent sector, which has experienced a very rapid output growth mostly as a result of innovation. In the software case we therefore asked how much more software consumption will there be as a result of increased output in all the other sectors, and estimate the answer to be 8 per cent since most of the software sector output is for business use.

¶ The impact of barriers to productivity in all the other sectors is calculated as the residual since all the other components of the output gap can be directly assessed. This is fortunate since we are unable to measure this directly without undertaking a study of all the sectors in the economy.

Exhibit A1

METHODOLOGY FOR SECTOR BASED OUTPUT GAP ESTIMATES

Factors	Methodology
• Barriers to productivity in the studied sector – Product markets – Capital markets – Labour markets Output impact allocated to these factors pro rata to their direct impact on productivity	• Price sensitivity x Share of sector in final value of product/services x Price reduction due to higher total factor productivity – excluding the impact from restrictions in other sectors (included in the 'barriers to productivity in all other sectors' column) as well as from country specific factors (included in the 'sector specific external factors' column) • Impact on demand if new product/service becomes available (e.g., free local calls) assuming no change in income level • Impact on trade of lower prices and/or more innovation (comparison of relative trade positions with the U.S. – assuming the U.K. has the same relative exchange rate as the U.S.*)
• Barriers to productivity in all other sectors	• Calculated as the **residual** since all other factors can be estimated directly • Includes indirect effects from barriers in other sectors leading to lower productivity in the studied sector
• Sector specific external factors	• Differences in consumer preference (higher share of spending given income levels, income elasticity and difference in relative prices) • Includes the impact from country specific factors which affected productivity such as the impact of weather on U.K. hotels
• Impact of aggregate lower labour input (less incentives to work and preference for leisure)	• Sector specific income elasticity x 8% Estimated impact of lower labour input on overall income

* This would indeed be the case if macroeconomic conditions and productivity levels across all sectors are the same as with the U.S.

Exhibit A2

RATIONALES FOR AUTOMOTIVE OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	-3*	• Price/income elasticity around 1 (estimates in the literature range form 0.5 to 1.5)
• Capital market barriers in sector	6	• 20 points increase due to lower prices – Sector accounts for 60% of final price – 30% lower manufacturing costs due to higher TFP
• Labour market barriers in sector	2	• Negative 15 points due to increased trade deficit (the U.S., not being the global benchmark with more open trade barriers, has a higher trade deficit than the U.K.)
• Barriers to productivity in other sectors	12	• Residual (example: less efficient car retailers)
• Sector specific external factors	10	• Higher consumption of cars in the U.S. (given relative prices and income levels) – lower fuel prices and more spread out cities
• Impact of aggregate lower labour input	8	• Based on sector specific income elasticity (impact of 8% lower income)
Total output gap	**35**	

* Net effect of trade barriers (lower prices vs. higher share of imports)

Exhibit A3

RATIONALES FOR FOOD PROCESSING OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	10	• 0.3 price/income elasticity (based on the long term trend of output/income growth in the U.S.)
• Capital market barriers in sector	0	• 3 points increase due to lower prices – Sector accounts for 50% of final price – 20% lower manufacturing costs due to higher TFP
• Labour market barriers in sector	0	• 7 points increase due to decrease trade deficit as a result of more product innovation and increase production capacity following the removal of quotas
• Barriers to productivity in other sectors	3	• Residual (example: less productive food retailers)
• Sector specific external factors	-5	• Higher consumption in the U.K. (given relative prices and income levels)
• Impact of aggregate lower labour input	2	• Based on sector specific income elasticity (impact of 8% lower income)
Total output gap	**10**	

Exhibit A4

RATIONALES FOR FOOD RETAIL OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	2	• 0.5 price elasticity (estimated to be slightly higher than food processing finding)
• Capital market barriers in sector	0	• 2 points increase due to lower prices – Sector accounts for 25% of final food price – 15% higher distribution costs (lower labour productivity and higher land costs)
• Labour market barriers in sector	0	
• Barriers to productivity in other sectors	3	• Residual (example: spillover effect from less productive food processing sector)
• Sector specific external factors	0	
• Impact of aggregate lower labour input	0	• Substitution effect between food retail and restaurants as income grows
Total output gap	**5**	

Exhibit A5

RATIONALES FOR HOTELS OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	15	• 1.5 price/income elasticity (based on the long term trend of output/income growth in the U.S.)
• Capital market barriers in sector	0	• 15 points increase (33%) due to 22% lower overall prices – Sector accounts for 50% of final price – 45% labour productivity gap
• Labour market barriers in sector	0	
• Barriers to productivity in other sectors	23	• Residual (example: lower productivity in the construction industry)
• Sector specific external factors	10	• 5 points of the 10 points output gap with France can be associated with the weather (the other 5 results from higher productivity in France) • The impact of this external factor doubles once all other problems are solved
• Impact of aggregate lower labour input	12	• Based on sector specific income elasticity (impact of 8% lower income)
Total output gap	**60**	

Exhibit A6

RATIONALES FOR TELECOM OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	15	• 1.5 price/income elasticity (based on the long term trend of output/income growth in the U.S.)
• Capital market barriers in sector	5	• 20 points (40%) increase due to economic pricing and more services: Sweden currently has around 70% higher minutes per capita than the UK, which represents around 40% of the output gap
• Labour market barriers in sector	0	
• Barriers to productivity in other sectors	18	• Residual (example: less telecom usage by the retail banking industry)
• Sector specific external factors	0	
• Impact of aggregate lower labour input	12	• Based on sector specific income elasticity (impact of 8% lower income)
Total output gap	**50**	

Exhibit A7

RATIONALES FOR SOFTWARE OUTPUT GAP ESTIMATES

Indexed points, based on U.S. output

Factors	Estimate of impact on output	Rationale
• Product market barriers in sector	5	• The U.K. would have 85% more output if it had the same trade surplus (rather than deficit) as the U.S. in packaged software (adjusted for the difference in country sizes)
• Capital market barriers in sector	10	• The 15 points represent the share of capital and labour market factors in the productivity gap (the rest is due to spillover effects – see below)
• Labour market barriers in sector	0	
• Barriers to productivity in other sectors	42	• Residual (includes the impact on innovation/trade of not having leading edge customers)
• Sector specific external factors	5	• More entrepreneurial culture in the U.S.
• Impact of aggregate lower labour input	8	• Lower consumption of end-users across all sectors
Total output gap	**70**	