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**EMPLOYMENT RELATIONS
RESEARCH SERIES NO. 46**

People, Strategy
and Performance:
Results from the Second
Work and Enterprise
Business Survey

THE WORK FOUNDATION



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People, Strategy and Performance:
Results from the Second Work and
Enterprise Business Survey

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The views expressed in this report are the authors' and do not necessarily reflect those of the Department of Trade and Industry or the Government.

Foreword

The Department of Trade and Industry's aim is to realise prosperity for all. We want a dynamic labour market that provides full employment, flexibility and choice. We want to create workplaces of high productivity and skill, where people can flourish and maintain a healthy work-life balance.

The Department has an ongoing research programme on employment relations and labour market issues, managed by the Employment Market Analysis and Research branch (EMAR). Details of our research programme can be found on our website: www.dti.gov.uk/er/emar

DTI social researchers, economists, statisticians and policy advisors devise research projects to be conducted in-house or on our behalf by external researchers. Projects typically evaluate good practice, look at individual and collective employment rights, evaluate the impact of particular policies or regulations, or examine labour market trends and issues. We also regularly conduct large-scale UK social surveys, such as the Workplace Employment Relations Survey (WERS).

We publicly disseminate results of this research through the DTI Employment Relations Research series and Occasional Paper series. All reports are available to download at <http://www.dti.gov.uk/er/inform.htm>

Anyone interested in receiving regular email updates on EMAR's research programme, new publications and forthcoming seminars should send their details to us at: emar@dti.gov.uk

The views expressed in these papers do not necessarily reflect those of the Department or the Government. We publish them as a contribution towards open debate about how best we can achieve our objectives.



Grant Fitzner
Director, Employment Market Analysis and Research

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Executive summary

Results from a telephone survey of nearly 3,000 UK businesses indicate that the key to businesses achieving higher levels of productivity and performance is to develop complementary strategies across several performance practices or drivers. High-performance work practices have more impact when implemented in bundles rather than in isolation.

Further, effective people management is key to higher levels of productivity and performance. People management has a significant, positive impact on 6 of the 12 individual performance outcomes discussed in the report; nowhere does better people management have a negative impact on the performance outcomes.

When European leaders met in Portugal in March 2000 they set the European Union the goal of becoming 'the most dynamic and competitive knowledge-based economy in the world' by 2010. The Lisbon Agenda, as it became known, set out the way to achieve this with a series of goals in areas such as employment, innovation, enterprise, liberalisation and the environment.

2005 marks the half-way point on the route to the fulfilment of the Lisbon goals and, in the case of the UK, Ministers have re-affirmed those goals and the need to focus on jobs and growth, because high quality jobs are the route to prosperity for all. Closely associated with the need to focus on jobs and growth is the need to increase the UK's productivity growth rate.

Internationally, the UK needs to raise its productivity growth rate in order to sustain its position as one of the world's leading economies. At present, the UK's productivity growth lags behind many leading European Countries such as France and the Nordic countries, despite superior overall GDP growth, more-or-less full employment and low inflation.

Domestically, there is a significant gap between the highest and the lowest performing businesses in the UK. Reducing this gap would help to improve the UK's overall productivity. Raising productivity levels ensures that firms enjoy a lower cost base and that scarce resources are used more efficiently.

With this in mind, in 2004, the Department of Trade and Industry (DTI), the Health and Safety Executive (HSE), the Sector Skills Development Agency (SSDA), AstraZeneca, EDF Energy, Hermes Pension Management, Manpower/Working Links, Microsoft, PricewaterhouseCoopers, Rolls Royce, Royal Bank of Scotland, Standard Chartered, and The Work Foundation launched a programme of investigation into how UK businesses could become more productive and thereby boost the UK economy's overall productivity growth rate.

Aims and objectives

The aims of this study are to answer five fundamental questions:

- What unique blend of business strategies is most likely to drive the competitiveness of UK firms?

- How should businesses transform what have traditionally been seen as 'soft' or intangible assets, such as leadership style and organisational culture, into 'hard' business drivers that deliver tangible economic value?
- How do some firms produce levels of gross profit, revenue growth and value added per head that outstrip those achieved by companies with apparently similar resources?
- Do these high performance metrics translate into improved share price performance?
- How can exceptional company performance be translated into productivity growth at firm, sector and national level?

The results of the research programme provide some robust answers to these questions. In turn, we suggest ways in which UK business and Government can increase the number of firms who understand better the characteristics of the most successful businesses.

Core findings

Nearly 3,000 UK businesses of all sizes and from all sectors were surveyed and ranked in a Strategic Management Index (SMI).

The SMI accurately measures firm performance. It breaks the 'code' of company performance by measuring strategic drivers and their implementation across five core areas.

The five core areas are: human resource practices; creativity and innovation management; customers and markets; stakeholder relationships; and shareholders and governance systems.

The results show that, in terms of value added, the top third of firms in the SMI out-perform the bottom two-thirds by £1,600 per worker per annum. It follows that if just 10 per cent of the UK's lowest performing firms moved to the performance levels of the top third of UK firms, by acting on the recommendations in this report, the UK's productivity growth rate would increase by ¼ per cent per annum.

Crucially, the research shows that higher productivity and better overall performance are associated with a high wage–high skills workforce, suggesting that UK businesses and the Government should concentrate on people development and innovation.

In terms of share price performance, the listed companies at the top of the SMI outperformed those at the bottom of the SMI by 20 per cent over the last year. This strong correlation is evidence of the way in which high performing firms can deliver shareholder value along with high levels of performance in other areas of the SMI.

Furthermore, the SMI is a powerful reader of any company's performance 'code'. Our survey evidence shows that over 25 per cent of the value added per employee is explained by the way in which the elements of the SMI and basic factor inputs are combined and delivered.

The impact of the SMI on basic factor inputs explains three per cent of the difference in revenue growth across businesses and six per cent of the difference in gross profit.

The five core clusters of the SMI have a powerful impact both on firm-level performance metrics and on total factor productivity. Acting on basic factor inputs, the five core clusters of the SMI explain 76 per cent of the difference in productivity across firms.

The five core areas of strategic interdependency captured by the SMI are translated into productive action through five 'intangible' factors of production.

What can firms do?

High performing firms have unique organisational structures resulting from geography, size and history that enable continued success. Most have a high degree of informality and continued dialogue supported by simple – though not simplistic – processes that allow fast decision-making. High performing firms openly share information between peers and networks of managers that need timely and accurate information in order to get the best job done. They have visible and accessible leadership and management, combined with high expectations from those in decision-making roles. Further, they distrust the *status quo*, valuing quality rather than quantity, and have a focus on the long-term and on outcomes. Finally, employee relations and culture are characterised – not codified – by pride, innovation and strong interpersonal relations.

Low performing firms typically have a focus on a narrow range of financially driven output metrics. Discussions about culture and performance are dominated by bureaucratic process and internal structure, rather than customer satisfaction or the end product. These companies do not have real energy or passion about the business or any restlessness with the *status quo*. Leadership in the lower-ranking organisations focuses more on 'what the numbers say' rather than how top managers behave and interact with others. Interactions are more formal, structured and 'set-piece' in format.

The five 'intangible' factors of production are employee relations and culture; communication; leadership; process; and structure. High performing companies offer clear lessons in what to do in each of these factors of production:

- **On employee relations and culture:** Keep asking questions about the *status quo*. Value quality rather than quantity, and keep the focus on the long term and on outcomes. Establish a climate of employee relations that is characterised, but not codified, by pride, innovation and strong interpersonal relations.
- **On structure:** Do not get hung up on structure. Structure is more a function of size, where the business is located, its history and its traditions. Structure does not drive performance but enables it. It is a means-to-an-end rather than an end in itself.
- **On process:** Keep processes simple and allow a high degree of informality. Combined with continued dialogue, these processes will allow faster decision-making.

- **On communication:** Encourage open sharing of information between peers and networks of managers so that timely and accurate information is given and received.
- **On leadership:** Make sure leadership and management are visible and accessible and set high expectations of those in decision-making roles.

What can Government do?

The Government is urged to continue to focus on improving policy in ways that will sustain the 21st Century high performance company. This involves:

- Encouraging investment in people through skills training, staff development and tackling workplace literacy.
- Encouraging the development of high trust relationships between employers and employees, on the one hand, and businesses on the other.
- Encouraging investment in innovation, R&D and knowledge.
- Entrenching the conditions for more sustainable high performance companies.

Our findings demonstrate that the Operating and Financial Review (OFR) can act as a vehicle to provide greater transparency on critical intangible aspects of business performance. The pension fund trustees, the investment community and the boards of listed companies now have the opportunity to focus on what are the core issues – over and above financial data – that should be measured and reported. We suggest the OFR could draw on metrics that cover the five areas of the SMI and the five ‘intangible’ factors of production. Once revealed, market mechanisms would take over and drive corporate behaviour in the right direction.

There is already a significant programme of work to address the current and future skills needs of the economy. Through the skills strategy, the Government continues to recognise the importance of investing in people and matching employees’ skills with employers’ needs. For example, support has been focussed on basic skills and level 2, but there is to be more emphasis on level 3 in the future, especially through initiatives such as the National Employer Training Programme. This is part of an overall demand-led framework, which includes employer-led sector skills agreements and reform of the curriculum and qualifications to better meet employers’ needs.

The Government should continue to develop a sophisticated means of distinguishing ‘good’ regulation from ‘bad’ and then apply it.

About this study

The Second Work and Enterprise Business Survey builds on The Work Foundation’s 2003 pilot study, entitled *The Missing Link: From Productivity to Performance*, the results of which can be found on The Work Foundation’s website: www.theworkfoundation.com

A shorter, more business focussed version of this report entitled *Cracking the Performance Code* was launched by The Work Foundation at a sponsor event at the London Stock Exchange in July 2005. See: <http://www.theworkfoundation.com/research/work/papers.jsp>

This report is based on 2,902 telephone interviews. The sampling frame was drawn up to reflect the size and sectoral distribution of the UK business population. However, due to the small proportion of large businesses, we included a top-up sample to ensure adequate numbers for meaningful analysis. We also allowed for geographical representation according to Government Office Regions. The telephone interviews were carried out between June and July 2004 by IFF Research Ltd on behalf of The Work Foundation.

The sample was generated using random digit dialling, but quotas were set, as discussed above. Interviews were carried out with Chief Executive Officers, Managing Directors, Chief Finance Officers or Human Resource Directors in the UK, in establishments of all sizes.

The study was conducted over the telephone using Computer Assisted Telephone Interviewing (CATI). Interviews lasted an average of 23 minutes. The response rate achieved was 23.7 per cent.

A series of case studies were also undertaken by The Work Foundation among the 10 core sponsors and businesses at the top and bottom of The Work Foundation's Strategic Management Index (20 each).

1. Background and introduction

EU consensus – Lisbon Agenda

In March 2000, European leaders set the European Union the goal of becoming 'the most dynamic and competitive knowledge-based economy in the world' by 2010. The Lisbon Agenda, as it became known, was a comprehensive but interdependent series of reforms. Actions by any one Member State, ran the argument, would be all the more effective if other Member States acted in concert.

2005 marks the half-way point on the route to the Lisbon goals and, in the case of the UK, Ministers have re-affirmed those goals and the need to focus on jobs and growth, because high quality jobs are the route to prosperity for all.

The productivity gap

The UK, while achieving productivity growth rates broadly comparable with other leading economies over the last decade, still lags behind a number of economies in terms of its overall level of productivity. UK productivity, measured by Gross Domestic Product (GDP) per worker, is similar to that of Germany, but below that of France and the US for instance.¹ These productivity gaps exist despite faster GDP growth in the UK than in most developed countries, near full employment and low inflation. To improve the UK's relative position and close these gaps it follows that our productivity growth rate must be consistently above that of France and the US.

Meeting the challenge

The productivity challenge facing the UK has further increased in recent years with:

- The globalisation of trade.
- The application and permeation throughout the economy of the new developments in information and communications technologies, which have increased the rapidity of knowledge flow and contributed to the development of intellectual capital, innovation cycles, sales and marketing between competing firms and between firms and consumers.
- The drive towards completion of a single market in goods and services across the EU.

While there is considerable academic debate about the relative contribution of each of these in terms of impact, pace and sustainability

¹ See <http://www.statistics.gov.uk/cci/nugget.asp?id=160> for more details.

(Cox 1995; Barras and Madhavan, 1996), it is clear that the success of policies aimed at improving the UK's productivity is increasingly dependant on wider forces in the EU and world economy.

The Work and Enterprise Survey

This was the context in which The Work Foundation, in partnership with six of the UK's leading firms, launched the first part of its programme of research in 2003. The aim was to get a better understanding of the factors that could facilitate organisations to improve their performance and productivity, given that there was a significant productivity gap between the highest and the lowest performing organisations in the UK (Harding *et al*, 2003). Reducing this gap by improving the performance of under-performing organisations would provide an important contribution to improve the UK's overall productivity. Such improvement could only be achieved at the level of the firm or organisation. By raising productivity levels, firms could achieve a lower cost base and scarce resources could be deployed more efficiently.

A Work Foundation literature review² found that most of the previous research on the impact of management practices on organisational performance had a narrow disciplinary focus. For example, the human resource management strand of research considered only the people-focused impact on business performance (Huselid and Becker, 1996). The literature review also found that there were few empirical studies that considered two or more domains of business strategy (the exception being O'Mahony and Vecchi, 2003).

The Work Foundation's first Work and Enterprise Survey aimed to fill these gaps by extending the range of strategic management activities covered and by looking at how they interact and impact on organisational performance.

As the first research programme progressed it became clear that firms' and organisations' management focused not on productivity *per se* but on improving levels of performance. Further, the research programme showed that the management of the most successful companies gave equal consideration and weight to five broadly defined core strategic areas, strategic business drivers:

- Human resource practices.
- Customers and markets.
- Shareholders and governance systems (including finance and investment).
- Stakeholders (including suppliers, customers, the community and, more generally, corporate social responsibility).
- Creativity and innovation management.

Top management in organisations that gave consideration to each of these five core strategic areas also recognised that they overlapped and mutually reinforced each other.

² See Harding, R; Cowling, M; Turner, N. 2003. *The Missing Link: From Productivity to Performance*. The Work Foundation. London.

For each of these five core strategic areas, The Work Foundation set out to develop a Strategic Management Index (SMI) together with an overall index that would provide a tool to classify and rank organisations across the economy.

The Work Foundation commissioned the first Work and Enterprise Survey in 2003: a survey of approximately 1,000 companies that broadly matched the profile of UK businesses. The 2003 Work and Enterprise Survey showed that:

- The highest performing companies were generating on average around 2½ per cent extra growth, 2½ per cent more sales per employee, 1 per cent greater profitability and 17½ per cent more growth in terms of exports as a percentage of sales than those at the bottom of the SMI ranking.
- The highest performing companies had, on average, a six per cent lead over lower ranking companies in terms of their ability to perform at the technological frontier of their industry.

A predictive measure based on the SMI, which The Work Foundation constructed in the course of this research, showed that the average UK firm was about 25 per cent less productive than it could have been if it adopted the bundle of strategies defined in the SMI.

Despite this evidence it was clear that there were still gaps in our understanding of how successful firms operated. The available evidence suggested there was no single measure or simple formula that could be applied that would ensure highly successful business performance. What then were the highly successful firms doing to achieve such performance and what more could the less successful businesses do to improve performance and close the performance gap? The first survey also raised questions about what Government might contribute to create the conditions to sustain highly successful firms and contribute to the transformation of the lower performing businesses.

The next stage of the research programme was to establish a panel made up of nine private sector firms to steer the second wave of research. These were:

- AstraZeneca
- EDF Energy
- Hermes Pension Management
- Manpower/Working Links
- Microsoft
- PricewaterhouseCoopers
- Rolls Royce
- Royal Bank of Scotland
- Standard Chartered

Supported by the Department of Trade and Industry (DTI), the Sector Skills Development Agency (SSDA) and the Health and Safety Executive (HSE), the second wave of the research programme provided support for

a comprehensive literature review covering the economics, psychology, human resources, innovation and strategic management literature, a second Work and Enterprise Survey of almost 3,000 UK firms and over 20 case studies. What follows are the findings from the second wave of the research programme.

The contributions of this study are twofold: first to provide an overview of current management practice in UK organisations, especially their focus on corporate objectives, strategy and business performance. Second, to identify the core elements of management strategy, particularly the contribution of people and people management, associated with high performance.

2. Research aims and objectives

The main aim of this research is to identify the factors that explain what it is about the most innovative and successful companies in the UK that differentiates them from lesser achieving organisations.

The five main questions addressed in this study are:

- What blend of business management strategies is most likely to drive competitiveness?
- What should businesses do to transform what have traditionally been seen as 'soft' or intangible assets, such as leadership style and organisational culture, into 'hard' business drivers that deliver tangible economic value?
- How do some firms produce levels of gross profit, revenue growth and value added per head that outstrip those achieved by companies with apparently similar resources?
- Do high performance metrics translate into improved share price performance?
- How can high levels of company performance be translated into productivity growth at firm, sector and national level?

The evidence is drawn from three main sources:

- A survey of nearly 3,000 businesses operating in the UK to identify the key drivers of the most successful businesses, according to rankings based on the Strategic Management Index (SMI).
- Matched share price data that is used in conjunction with predictive measures based on the SMI.
- Twenty detailed case studies that were undertaken to identify the core element of companies' high performance strategies.

Method of data collection

Information was provided by Chief Executive Officers, Managing Directors, Chief Finance Officers or Human Resource Directors. Interviews were conducted on the telephone and lasted, on average, approximately 23 minutes.

Survey – topic coverage

The interviews were wide-ranging and covered the following topics:

- Ownership and governance structures.
- Business dynamics and internal demographics.

- Top management's strategic priorities in trying to maintain their competitive position or gain advantage in their key markets and how these are translated into practice and results.
- The extent to which they made use of an array of management tools to drive and sustain business performance; including such things as human resource practices, innovation strategy and governance.
- The extent to which the companies were in a stable or rapidly changing environment.

A primary aim was to find out how highly successful businesses translated their strategic 'intent' into practices and achieved results. In particular, the emphasis that they gave to pursuing strategic objectives, the extent to which primary emphasis was given to two or more objectives and, whether combining two or more primary objectives had a greater impact than giving primary emphasis to a single objective. Was, for example, the combined effect of giving strategic priority to R&D, while at the same time engendering a climate where employees were empowered to be creative and innovative, stronger than the effect of R&D on its own, because strategic alignment across key business functions was critical to performance?

Companies were also asked to rank the importance they attached to a range of policies and practices when seeking to drive their business performance and competitiveness. These included:

- **People:** Ability to attract high quality workers; how skill-intensive their workforce needed to be to drive competitiveness; levels of investment in skills training; trade union membership and recognition; employee relations strategy; and the percentage of workforce with performance-related pay deals.
- **Customers and Markets:** Priority given to customer needs; the collection of systematic market intelligence; and the focus on product/service quality versus cost and speed.
- **Innovation:** Proximity to the technology benchmark for their sector; employees rewarded for creativity; employee autonomy to innovate; and the extent to which competitiveness is technology-led.
- **Stakeholder focus:** Active involvement in the local community; active involvement in local business networks; how stakeholder-driven active supply-chain management was; and active pursuit of socially responsible policies and practices.
- **Shareholders:** Prominence of shareholder considerations in business decisions; adequacy of access to investment funds; and how well regarded businesses were by the investment community.

The Strategic Management Index (SMI)

Combining the indices for each of these strategic areas provided the basis of the construction of The Work Foundation's Strategic Management Index (SMI). The SMI provides a measure of the aggregate impact of adopting a blend of strategies to drive performance. The value of the SMI lies in its

comprehensive coverage in terms of the range of strategic management issues covered. It is this that distinguished this study from much earlier survey work, which is predicated on the following assumptions:

- Evidence collected at establishment-level provides a more realistic and, therefore, more valid measure of what happens in practice, including firm performance, than the assessment of top management.
- High performance work practices, however defined, have more impact when implemented in 'bundles' rather than in isolation (Ichniowski *et al*, 1997).
- A 'contingency' approach to high performance – where the management seeks the 'best fit' between their strategic choices over business goals and the practices they choose to achieve them is more effective than applying a prescriptive template or 'scorecard' approach.

Statistical methods and analysis

The approach to the analysis is based on a three-stage methodology combining basic sample descriptive statistics, reliability tests for strategic items entering the six sub-indices and composite strategy index, and more sophisticated econometric analysis of performance.

Statistical analysis provided the basis for the construction of the indices required to analyse the survey data. These include: the construction of an index for each of the six core areas of strategic management which, when aggregated together, provide an overall SMI for each business. These provide the basis for the ranking and classification of companies into high, medium and low performers.

Using econometric techniques these indices were then tested to find out the extent to which there was any correlation or measurable impact on company performance using two primary 'hard' measures of performance:

- Measurable output = sales or value added; and
- Output = F (labour, capital, materials).

Here, labour is measured as full-time equivalent employees, capital as the value of plant and machinery and materials as the value of unfinished goods and bought-in services.

The hypothesis underpinning this approach was that part of the variation in output produced by the businesses cannot be explained by simply how many workers, machines and materials (factor inputs) each business uses. Further, that strategic management across the six areas was the key to unlocking the 'performance code'.

In addition to the two primary measures of performance mentioned above, the analysis also includes other measures of performance typically considered by businesses as important performance indicators. These were:

- Market position relative to competitors;
- Providing competitive returns to shareholders;
- Percentage of overseas customers;
- Percentage of sales exported;
- Sales growth over three years;
- Profit margins;
- Absenteeism;
- Employee commitment;
- Percentage of new technology sales;
- Operating at industry technology benchmark and;
- Operating at industry skills benchmark.

The case studies

The parameters of the qualitative research had already been determined by the methodologies developed in phase one. Organisations understand performance in terms of a range of 'hard' measures (such as market indicators like profit and share price) and 'soft' measures (perhaps the percentage of profits donated to charity or employee turnover). A key distinction here is about accountability and the consequences of underperforming on these measures.

A questionnaire was, therefore, designed containing questions organised into the five core areas, with additional questions about financial performance and measurement. Overall, the questionnaire aimed to establish:

- How do companies measure their own performance?
- How do others measure their performance?
- Why use the SMI?

As with the survey, the aim was not to ask how companies manage strategic interdependencies, as companies may not be aware of these interdependencies. A range of senior managers in case study organisations were interviewed using the semi-structured questions. Interviewees commonly included: Chief Executives, Finance Directors, HR Directors, Operations Directors, etc. A selection of line managers were also interviewed to construct a more balanced picture of company policy and, where possible, a focus group of staff.

3. Characteristics of the sample

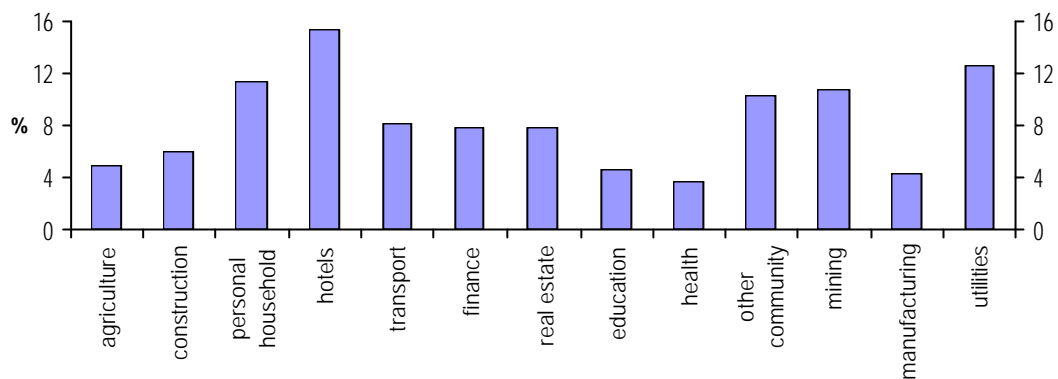
In this chapter we discuss the characteristics of the sample. The discussion focuses, in particular, on skills deficiencies by industry sector. Annex A provides detailed summary statistics. Table A1, Annex A, shows the employment breakdown (into micro, small, medium and large establishments), by industry sector. It is clear from Table 1 that micro businesses (with 0-9 employees) dominate in agriculture and the personal household sector. Micro businesses are, however, few in number in finance, education, health and the manufacturing sector. At the opposite end of the scale, large businesses (with 250+ employees) are commonplace in manufacturing, finance, utilities and mining.

Table A2, Annex A, shows that the vast majority, 72.2 per cent, of businesses in our survey had their headquarters in the UK. Approximately 12 per cent of businesses had their headquarters in another EU country and just over a quarter, 26.2 per cent, had their headquarters elsewhere in the world.

These aggregate figures hide some considerable variation across the different industry sectors. For example, agriculture, construction, retail/hotels/catering, education, health and other community are dominated by indigenous businesses. This strongly contrasts with finance, mining, manufacturing and utilities, in which businesses are, broadly speaking, equally likely to be located in foreign countries. It may well be that this is, in part at least, a reflection of the different stages and patterns of globalisation and production across sectors. However, it may well be indicative of the sectors where the UK needs to be more productive to compete internationally. It also suggests that Europe and the UK are much more integrated in business terms than the UK and North America, where only 9.32 per cent of businesses in our survey had their headquarters located.

Figure 1, below, shows the proportion of the business stock that is less than five years old (new businesses) by industry sector. The proportion of new businesses in a given industrial sector is considered an indicator of the level of dynamic, entrepreneurial competition as well the presence of significant barriers to entry. The findings show some significant sectoral differences. In the retail/hotels/catering, for example, new business penetration is highest at 15.4 per cent of the current stock. In the personal household, utilities, mining, and other community sectors new business penetration is also comparatively high, with figures in excess of 10 per cent of the total stock. In health the equivalent figure is only 3.7 per cent, with comparatively low proportions in manufacturing (4.3 per cent), education (4.7 per cent), agriculture (4.9 per cent) and construction (6.0 per cent).

1. Proportion of the business stock less than five years old, by industry sector



Source: The Work Foundation

Table A3, Annex A, provides a selection of indicators relating to corporate governance according to the size of firms, as measured by the number of employees. These show that the membership of boards of directors increases with the number of employees. Micro businesses, typically owner-managed, have on average two owners both of whom act in an executive director capacity. This form of governance is termed 'closely held' and is associated with a perfect alignment of ownership and control which means that there is no scope for managers to pursue their own interests to the detriment of owners as they are one and the same. The findings show that micro firms are very unlikely to have external non-executive directors and suggest that micro businesses do not benefit from outside knowledge, advice or expertise.

Small firms (10-49 employees) also typically remain 'closely held', though the management team may include non-owner managers. For medium-sized firms (50-249 employees), the typical board size is larger still and includes non-executive directors. This suggests that the managerial span of control widens as the work organisation becomes more structured, increasing the division of labour and task routine. A significant minority of medium-sized firms have diversified ownership structures, with publicly traded shares. The potential for agency problems to arise increases substantially at the level of the small firm, since managers can pursue strategies that do not necessarily equate with efficiency and wealth creation.

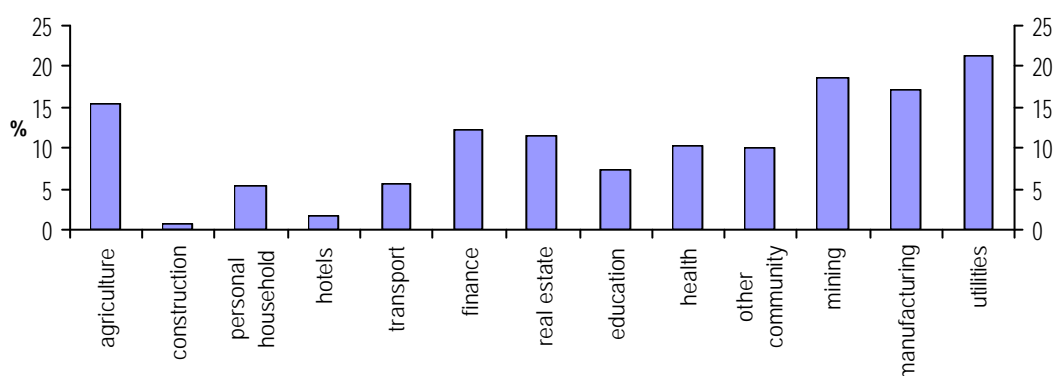
Next we explore the extent to which businesses are operating below, at, or above their industry sector benchmark for skills and innovation. We

are interested in quantifying the proportion of businesses that fall below their industry standard, since these businesses may be acting as a significant drag on future productivity growth.

Businesses were asked to rank the prevailing skills levels in their industry sector on a scale of 1 to 5. The industry benchmark is simply the mean score for businesses in a given industrial sector. We focus on the proportion of businesses falling below the industry benchmark. The results appear in Figure 2.

The findings suggest the size of the under-skilled tail (businesses falling below the industry benchmark) varies significantly by industry sector. In construction and retail/hotels/catering, sectors with very different skills levels, the proportion of poorly skilled businesses is very small. This shows that nearly all businesses in these sectors operate at, or above, their industry skills benchmark. In the construction sector there is a high-skills equilibrium (industry benchmark high, but most businesses achieve it); in retail/hotels/catering there is a comparatively low-skills equilibrium (industry benchmark low, but most businesses achieve it).

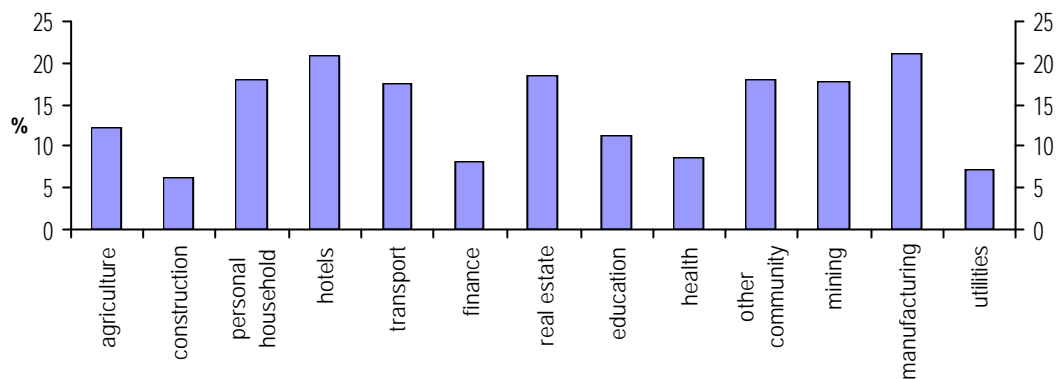
2. Proportion of businesses below the industry benchmark for workforce skills, by industry sector



Source: The Work Foundation

Leaving aside the utilities sector (because there are insufficient numbers of cases to provide a sound basis for statistical analysis), it is clear from Figure 2 that in manufacturing, mining and agriculture a relatively large proportion of businesses fall below the industry skills benchmark. In each case in excess of one in every six businesses falls below the industry skills benchmark. Secondary analysis showed that external training days were negatively associated with being below the industry skills benchmark, suggesting that businesses in these sectors could undertake more external training to bring themselves up to the industry benchmark.

3. Proportion of businesses below the industry benchmark for innovation, by industry sector



Source: The Work Foundation

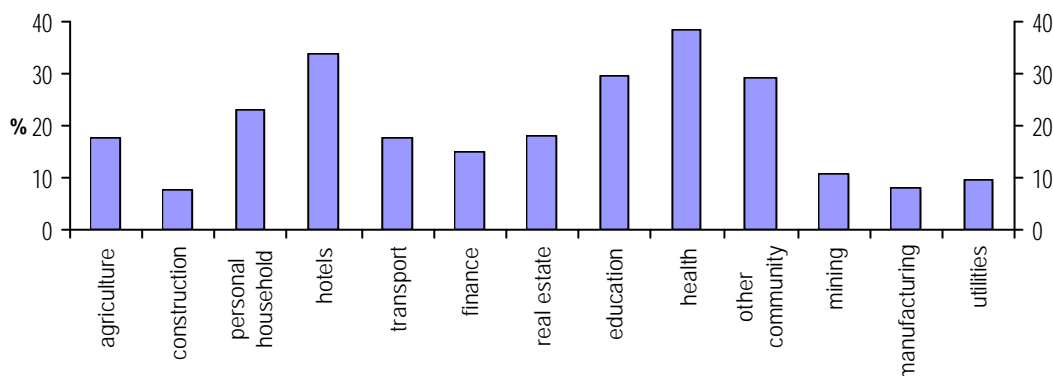
Having discussed the industry skills benchmark, we turn now to the industry innovation benchmark. Firms were asked to rank how innovative their industry sector was. On average, 16.1 per cent of UK businesses fell below the innovation benchmark for their industry sector, where the benchmark was simply the mean score in each industry sector. This amounts to one in every six businesses. Broadly, seven industry sectors had an above average share of businesses falling below the industry innovation benchmark. These were manufacturing, retail/hotels /catering, real estate, personal household, mining, other community and transport, a diverse set of sectors, with an equally diverse set of innovation standards (i.e., some have a high benchmark and some a low benchmark). Thus it is clearly not the case that only in high innovation sectors do businesses struggle to keep up with the pace of innovation. This contrasts with construction, utilities, finance, health, education and agriculture where the proportion of sub-innovation benchmark businesses is substantially lower.

4. The People Index

People are widely regarded as the most significant asset a business has. Thus, people management has been the focus of a considerable amount of attention from academics, businesses and public policy makers. Economists, in particular, have expended a great deal of effort trying to pin down the factors that determine labour productivity. In this section we discuss a total of 12 measures or 'items' that relate to employment and people management. The 12 measures relate variously to employment structure, skills shortages, working environment, training, pay systems, communication systems and performance review mechanisms. Our ultimate aim is to produce a People Index that captures a consistent bundle of people strategies.

First, we consider the share of part-time employment in total employment. The figures show that, on average, 19 per cent of employees work part-time. The share of part-time employment in total employment, does, however, vary considerably by industry sector, as Figure 4 shows.

4. Share of part-time employment in total employment, by industry sector

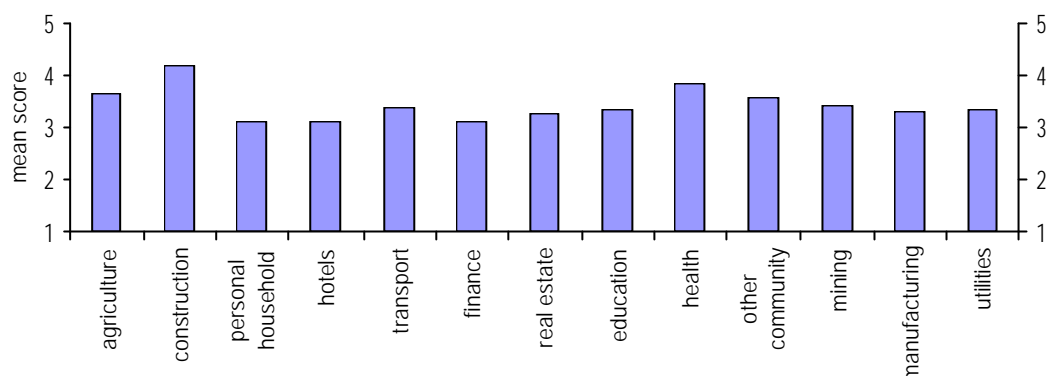


Source: The Work Foundation

The incidence of part-time working is highest in service sector industries such as health, retail/hotels/catering, education and other community, all with shares in the region of 30 per cent. This contrasts with shares of less than 10 per cent in utilities, manufacturing and construction.

Skills shortages have been identified as a significant constraint on the ability of UK businesses to expand employment and to raise productivity. Our data suggests that, on average, UK industry is characterised by moderate skills shortage, with a mean score of 3.38, indicating a modest level of agreement with the statement that skills shortages are a significant constraint at the industry level.

5. Skills shortages, by industry sector

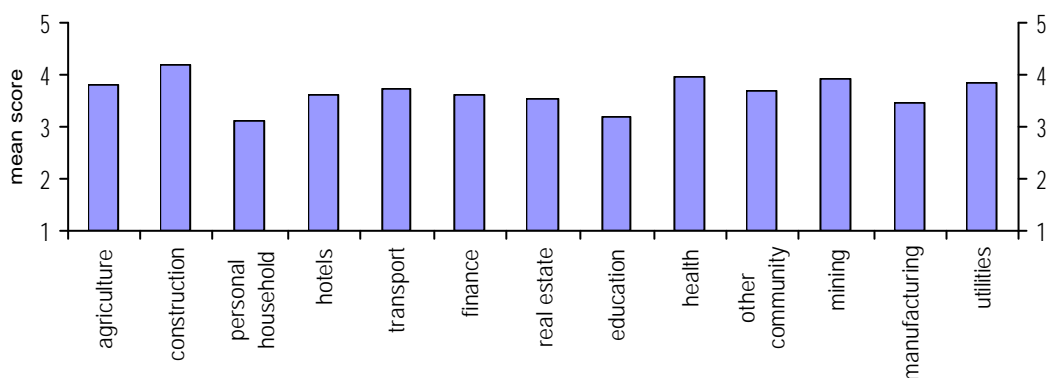


Source: The Work Foundation. Firms were asked to indicate the extent to which they agreed/disagreed with the statement that their industry sector was characterised by skills shortages. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

As is clear from Figure 5, skills shortages vary by sector. Construction, in particular, appears to have a significant problem. To a lesser extent so does agriculture, health and other community. This contrasts with personal household, retail/hotels/catering and finance, where skills shortages do not appear to be as important a constraint.

Having observed the extent of skills shortages at the industry level, Figure 6 highlights the extent to which these shortages permeate down to individual businesses.

6. Recruitment problems, by industry sector

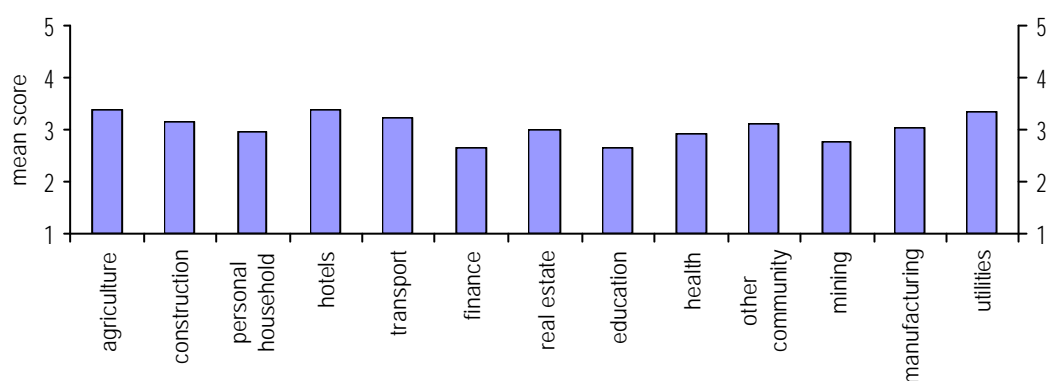


Source: The Work Foundation. Firms were asked to indicate the extent to which they agreed/disagreed with the statement that recruiting employees with the appropriate skills set was a serious problem. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Broadly speaking, skills shortages at the level of the individual business are, on average, more severe than at the industry level. This implies that a small minority of businesses are relatively unaffected by industry-level skills shortages.

In three sectors with severe industry-level skills shortages – agriculture, construction and health – shortages are also commonplace at the business level, indicating an industry-wide skills problem. This contrasts with the retail/hotels/catering, transport, real estate, mining and utilities sectors, where there are moderate skills shortages at the industry level, but where moderate skills shortages at the industry level impact significantly on a majority of the businesses. Finance is a sector characterised by relatively low-level skills shortages at the industry level, but these skills shortages seem to have a wide impact on the businesses operating in this sector. Taken as a whole, our evidence suggests that skills shortages must be tackled at the industry level rather than at the business level.

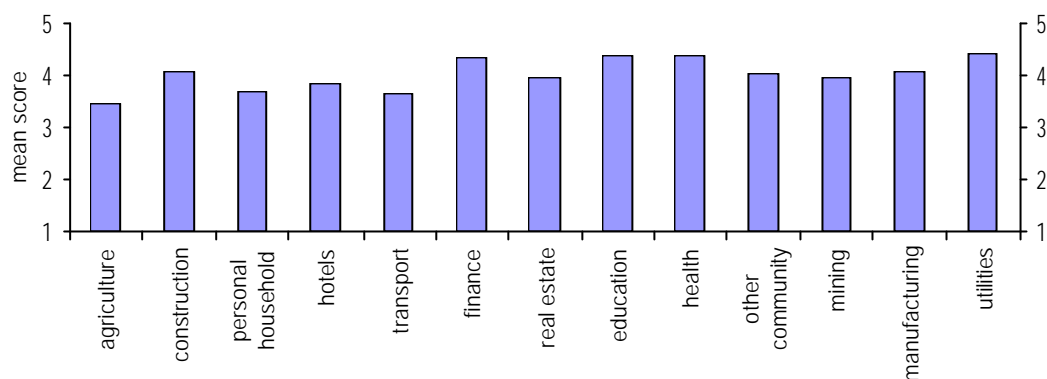
7. Gap between skills needed and current workforce skills is growing, by industry



Source: The Work Foundation. Firms were asked to indicate the extent to which they agreed/disagreed with the statement that the gap between skills needed and current workforce skills was growing. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

In total, 84 per cent of businesses feel that the gap between the skills of their current staff and those needed to conduct their business in the future is growing. Importantly, 81 per cent of businesses have current problems recruiting skilled staff and have an under-skilled workforce. This may well be a significant drag on labour productivity growth and general business performance. Figure 7 shows that these skills gaps are most acute in agriculture, construction, retail/hotels/catering, transport, other community and utilities. By comparison, in finance, education and mining, skills gaps do not appear to be widening to such an extent.

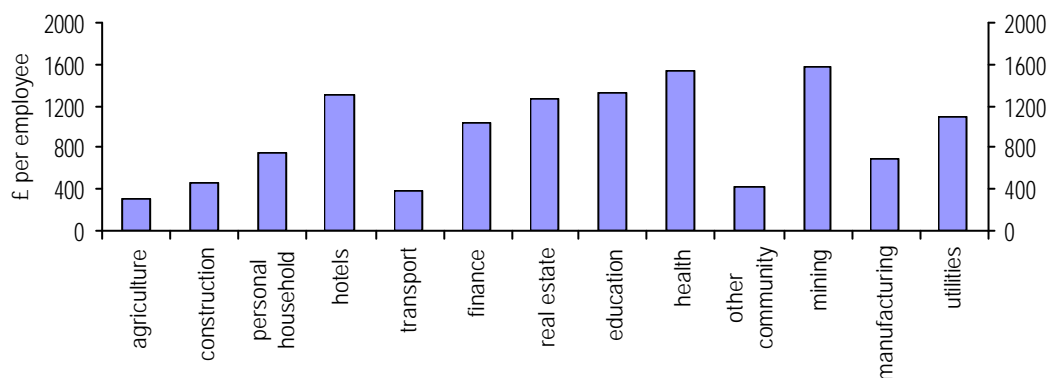
8. Business investment in training to raise skills levels, by industry



Source: The Work Foundation. Firms were asked to indicate whether they invested in workforce training to raise the skills of their employees. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Figure 8 shows that there is general agreement that training is important in terms of raising the skills levels of employees, however the strength of agreement varies across businesses, with an average score of 3.97. We observe the strongest agreement in finance, education, health and utilities; the strength of agreement is weakest in agriculture, personal household and transport.

9. Average training expenditure per full-time employee, by industry

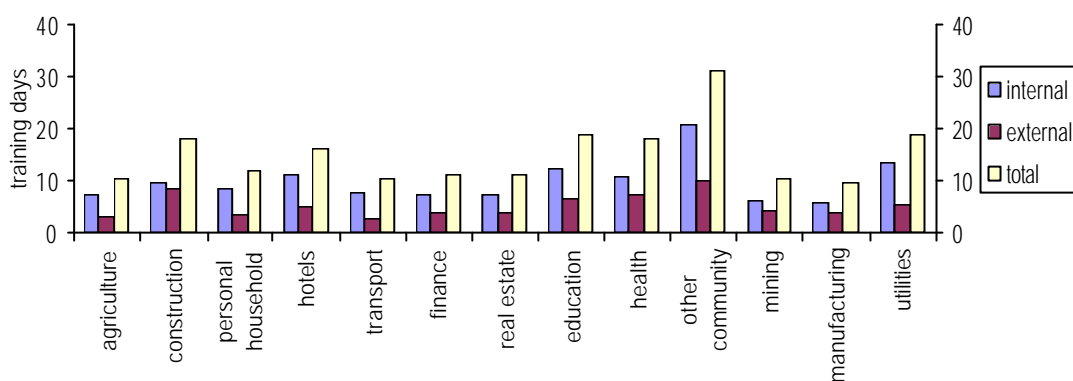


Source: The Work Foundation.

The median training and skills development expenditure per employee is £167 per annum. The mean is £874. As Figure 9 shows, this is, however, an area in which there is substantial variation across different industry sectors. In agriculture, construction, transport and other community, expenditure is very low. This is rather strange given that, as noted above, these sectors are characterised by skills shortages and growing skills gaps. We might conclude that at least part of the current problem lies with businesses lack of investment in their employees' skills. By

comparison, mining, health, retail/hotels/catering, education and finance all have relatively high training and skills development expenditures. Pair-wise correlations between our skills shortage items and average training expenditure reveal a positive association between industry-level skills shortages and training expenditure (i.e., businesses spend more when industry skills shortages are severe) and negative associations between training expenditure and business-level skills gaps. However, none of these correlations are statistically significant. We do find that commitment to training, as a means of raising skills levels, is also associated with larger training expenditures per employee.³ This shows internal data consistency, in the sense that businesses showing a commitment to training at a strategic level really are spending more.

10. Average training days per annum per employee, by industry



Source: The Work Foundation.

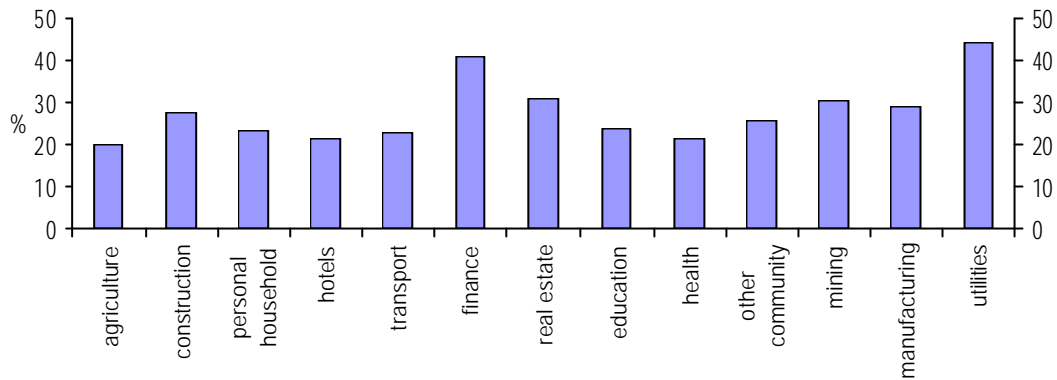
We turn now to the average number of training days per employee per annum. On average, each employee receives 14 days' training per annum, of which around two-thirds is provided internally. In certain sectors, notably other community and, to a lesser extent, construction, retail/hotels/catering, education, health and utilities, employees receive more than fourteen days' training per annum. The balance between internally and externally provided training also varies across industry sectors. For example, in construction, employees receive, on average, nine days of internal training and eight days of external training per annum, a ratio of internal to external training of 1.15:1. This compares to a ratio of 3.11:1 in transport. Interestingly, there is no significant correlation between training expenditure and number of days' training received, suggesting that some businesses choose shorter, but more expensive modes of training. There is, however, a positive and significant association between internal and external training days⁴, implying that businesses that have high levels of internal training also have high levels

³ Pair-wise correlation: 0.123^{***} where *** indicates statistical significance at the 1 per cent level of significance.

⁴ Pair-wise correlation: 0.182^{***}

of external training or, put another way, internal and external training are seen as complements and not as substitutes for one another.

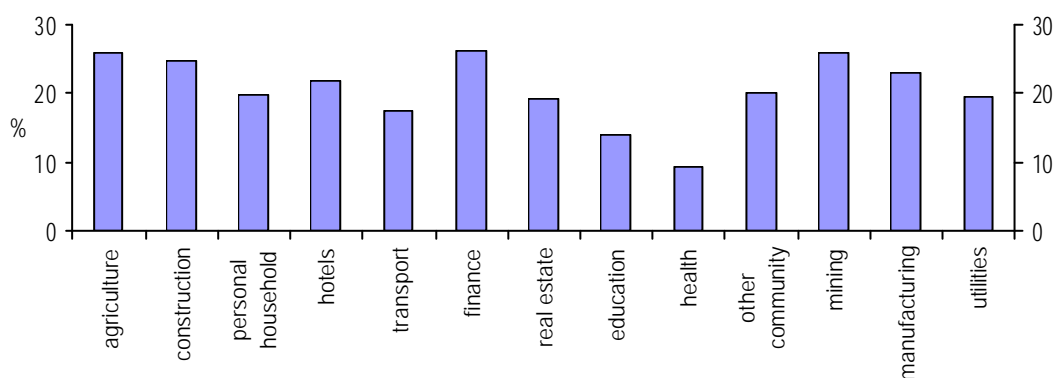
11. Proportion of employees on performance-related pay (PRP), by industry



Source: The Work Foundation.

On average, 27 per cent of employees have an element of performance-related pay (PRP) in their overall remuneration package. Even in those sectors with the lowest coverage, around one in five employees receive PRP according to Figure 11. However, in some sectors, notably finance, utilities, real estate, mining and manufacturing, considerably higher proportions of employees receive PRP. In the former two sectors more than 40 per cent of employees are covered by PRP systems.

12. Share option coverage, by industry

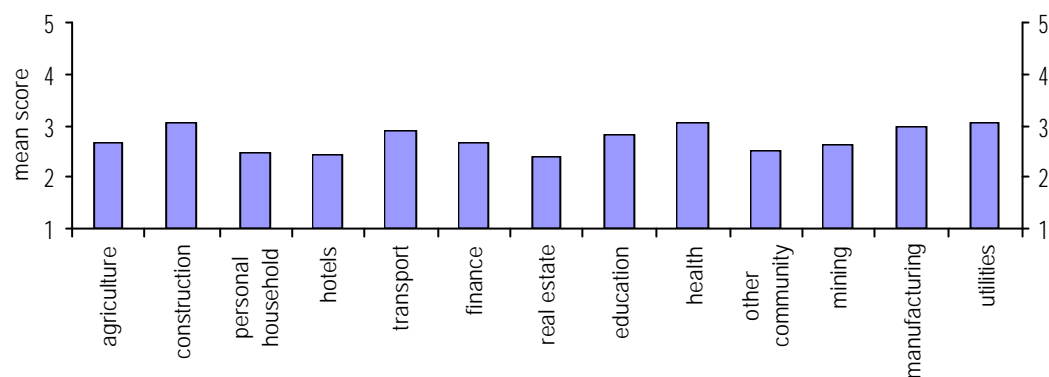


Source: The Work Foundation.

Share options are similar in spirit to performance-related remuneration packages. On average, 21 per cent of senior managers receive share options as part of their total pay package. Here again, as with PRP, there is substantial variation across different industry sectors. For example, only

9 per cent of senior managers in the health sector receive share options. This compares to more than 25 per cent of senior managers in agriculture, finance and mining. This suggests that businesses in different sectors have different means of incentivising senior management. A pair-wise correlation between PRP and management share options shows a positive and significant association⁵, suggesting that businesses that have higher PRP coverage are also more likely to offer senior managers share options as part of their remuneration package.

13. Trade union recognition, by industry

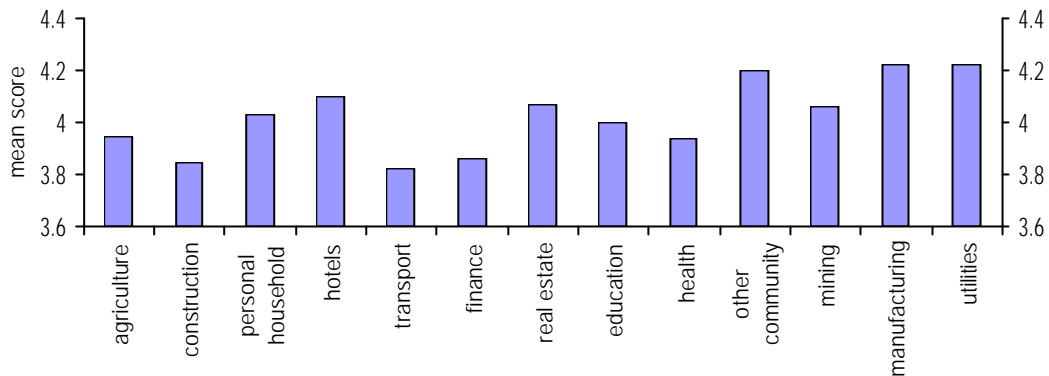


Source: The Work Foundation. Firms were asked to indicate their support for/recognition of trade unions. 1 indicates little support and 5 indicates strong support. It follows that the mean score must fall between 1 and 5.

Turning to trade union recognition, on average, 40 per cent of businesses recognise trade unions. Figure 13 shows that the degree of recognition exhibits substantial variation across sectors. The data does show that there is more than average support in construction, health, manufacturing and utilities and less than average support in personal household, retail/hotels/catering and real estate. Interestingly, there is no significant association between the share of part-time workers in total employment and trade union recognition.

⁵ Pair-wise correlation: 0.066 ***

14. Business prioritises staff ability to multi-task, by industry



Source: The Work Foundation. Firms were asked to indicate if improving the ability of their staff to undertake a wider range of tasks was a priority. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Figure 14 shows the importance businesses attach to their employees' ability to multi-task. In total, 77 per cent of businesses prioritise improving the ability of their staff to undertake a wide range of tasks. However, this appears to be more of a priority for businesses in the other community, manufacturing and utilities sectors, than is the case in construction, transport and finance.

Case study: MBDA Missile Systems

MBDA are a leading-edge technology-based company with operations in the UK, France and Italy. Their shareholders comprise BAE Systems (UK), EADS (pan-European) and Finmeccanica (Italy). MBDA appears towards the top of the SMI ranking of companies.

The distinctive features of MBDA that appear to account for its above average SMI ranking can be identified as follows:

- Technological excellence; the organisation employs some of the world's leading engineers.
- A contented, stable and experienced workforce where there is a premium on technical expertise in the market place.
- An integrated, systematic and rigorous approach to managing and developing individual performance.
- A market-leading position in a consolidated European marketplace, where there are significant barriers to entry.
- A relatively stable (but increasingly competitive) marketplace, ownership structure and financial base.

The organisation has a comprehensive strategic HR programme across areas such as reward and recognition; learning and personal development; communications and involvement; organisational development; and resource and career management.

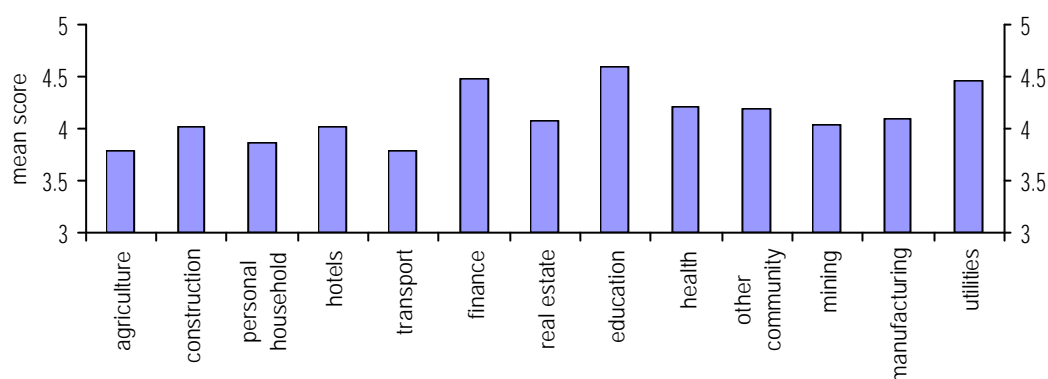
There is a common and well-embedded performance management system across the UK arm of the company. The corporate intranet is used to create a paperless performance management system and the company assesses individuals on how they achieve their targets and goals, as well as whether they have achieved those targets and goals. Objectives are cascaded

throughout the workforce in January-March each year in a well-rehearsed, automated process that coincides with a series of events and road shows that set out the organisation's current performance and future priorities. The result is a clear 'line of sight' between individual objectives and the priorities of the organisation as a whole. The performance management system is also used to systematically identify learning and development needs which are then prioritised against corporate priorities and available investment. The company has a strong development ethos and while technical training naturally takes the biggest slice of available investment funds, management and leadership development investment is growing.

Some key positions, when advertised, are restricted to certain cadres of management and top management regularly move into different functional disciplines. While the company used to be very hierarchical and bureaucratic, all the UK workforce now have equal status with harmonised terms and conditions, which has created a more egalitarian environment in which non-performance entitlements have been eradicated.

Finally, the workforce is generally very stable. Attrition is less than four per cent per annum, the average age is about 45 and the average length of service 15-25 years. Regular attitude surveys show a generally contented workforce.

15. Annual staff reviews of skills and performance, by industry



Source: The Work Foundation. Firms were asked if they annually reviewed the skills and performance of their staff, so as to enhance their performance. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

In this last section, we discuss annual reviews of skills and performance, by industry sector. On average 78 per cent of employers annually review the skills and performance of their staff so as to enhance the contribution they make to their business. In certain sectors (education, finance and utilities), staff reviews are very important, and in others (agriculture, personal household and transport) considerably less important. This suggests that a significant minority of the business community have no formal mechanism for evaluating and developing their employees. Importantly, annual employee reviews are positively associated with the coverage of employees by PRP systems.⁶ This implies that businesses might be using employee reviews, in the main, for assessing the amount of PRP they receive, rather than as a tool for promoting wider employee development.

⁶ Pair-wise correlation: 0.156 ***

Case study: Standard Chartered

Standard Chartered is one of the world's leading international banks. Founded in 1853, the bank is headquartered in London and is listed on both the London and Hong Kong stock exchanges. The bank serves both consumer and wholesale customers and aims to be the 'right partner' for both groups of customers in 56 countries. Standard Chartered employs over 1,250 people in the UK and Europe, providing products and services for multinational corporations and international banks in Europe, trading and investing across Asia, Africa, and the Middle East.

Five core values are central to benchmarking behaviour internally. The core values or aims – to be responsive, trustworthy, creativity, international and courageous – are clearly espoused and lived out on a day-to-day basis, forming part of the bank's overall strategy. Standard Chartered believes that living the values is critical to the bank's business performance and as part of performance management all employees are assessed on how well they live out the values.

The bank puts a lot of effort into the measurement of employee engagement and productivity. The bank's annual survey, used to measure employee and team engagement, has achieved a 97 per cent voluntary participation rate. Detailed business outcome modelling has demonstrated that highly engaged teams deliver superior business performance. This includes higher revenue, profit margins, customer satisfaction as well as greater productivity. Indeed, productivity at the bank has increased rapidly in the last four years, in part due to a benign risk and credit environment, but also because of the performance-orientated culture.

A robust performance management system differentiates and recognises high performance in the bank. For example, exceptional performers receive individual recognition from the Chairman and Group Chief Executive. Individual performance ratings, coupled with group and business unit performance, form the basis of reward decisions. There is a strong focus on differentiating rewards according to individual performance contribution.

Finally, Standard Chartered believes good governance goes hand-in-hand with financial success. The bank's corporate responsibility aspiration and dedication to making a difference ensures participation in the local communities in which and with which it does business. This strong tradition of supporting local communities ensures business is strongly linked to the needs of the communities. This allows the bank to better understand how their skills, products and services can be used in the course of normal business. This commitment to corporate responsibility brings together the dynamism and focus of the whole organisation. The Corporate Responsibility Board Committee works to align business strategy with the bank's corporate responsibility aspirations.

From the 12 measures or 'items' discussed above we develop a People Index by generating the highest Cronbach's alpha score for an internally consistent set of items (measures). Assuming that high correlations between measures or 'items' are indicative of complementarities, we note that out of a total of 120 correlations, 110 were positive and of those, 66 were significant at the one per cent level. Only 10 were negative, of which only two were significant at the one per cent level. To test for reliability of the measures or 'items' that form our People Index we calculate Cronbach's alpha. This assesses the reliability of a summative rating scale

of the 'items' specified. We aim to maximise the score by removing items that reduce Cronbach's alpha. In this instance we are left with nine items. Our scale is simply the sum of the individual item scores.⁷

Case study: ECS Metering/EDF Energy Customer Field Services

ECS Metering and Data Services was formed in 1996 when it was decided to bring all metering activities together under one brand and one structure. Two companies were created – ECS Data Services Ltd and ECS Metering Services Ltd. Subsequently, and as part of the newly formed EDF Energy, ECS, now re-branded EDF Energy Customer Field Services, no longer operates as a contractor to EDF Energy but a direct labour force and intrinsic part of the business. This has removed the tensions within the organisation, who now see EDF Energy Customer Field Services as part of an end-to-end process delivering a range of products to ever more demanding customers.

How have they achieved this? Previously, the strategy was to offer metering services to other energy companies. They now offer a broader range of services under the EDF Energy retail brand. Known as the 'metering strategy', it aims to provide a one-stop shop for customers buying gas and electricity. Rather than just reading and maintaining meters, they now offer a range of services, including win backs, dual fuel, direct debits and other service extensions.

Customers are now able to ask operatives who come to their homes or business about a range of energy supply issues. Frontline operatives have extensive local knowledge of the socio-demographics of an area, which helps them to deliver high levels of customer service. This level of local knowledge is critical in delivering service extensions and further products and services. The workforce is in the process of undergoing considerable training to enable them to offer service extensions to customers. With 7 million customer visits per year, the opportunity to do this presents a considerable business opportunity. Shifts in how they reach customers has also led to improved performance, for example cold calling used to secure only a 30 access rate, but now with an appointments system, the rate has risen to 90 per cent.

The company has invested in new hand-held technology for its field staff that will support their drive towards service-extension. They do not anticipate concern over monitoring or the date stamping of jobs, as these issues were successfully dealt with during the introduction of the previous generation of technology. In addition, the planned up-skilling initiative will reinforce the view that technology represents a tool to deliver improved service and business development opportunities.

Culturally, EDF Energy Customer Field Services retains elements of a public service ethos, which the company believe bring with it the advantage of employee commitment and the sense of 'having a wider social purpose' in providing electricity and gas for the least advantaged. However, incorporating a tougher performance management regime, driven by the need to operate in a commercial environment, has led to a sharper focus on getting the industrial relations climate on an even keel. But the company is aware that if customers lose their gas or electricity supply, then getting their supply re-connected should be done at all costs since very few people question that this is the right thing to do given the social ramifications of not having heat or light.

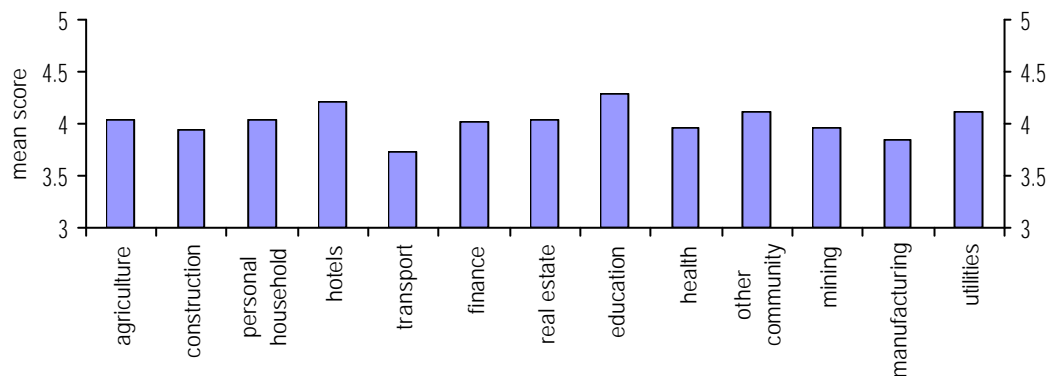
⁷ The scale derived from our index appears to work well: the estimated correlation between it and the underlying factor 'items' is 0.86, and the estimated correlation between this battery of nine items and all other nine item batteries from the same domain is 0.75. Test, here 0.25, is the average inter-item correlation and 0.75 is the alpha coefficient for a test scale based on all items. Sign shows the direction each item variable entered the scale, here all items are positive.

5. Other strategic indices

Here, we initially present information about how businesses promote innovation and creativity through employee engagement, technology usage, prevailing attitudes to risk and research and development (R&D) expenditure. We also consider effectiveness of innovation in terms of how important new products and services are in terms of total sales. Later, we consider customers and markets, stakeholder relationships, shareholder focus and health and safety. In each case we derive a sub-index as we did in the previous chapter.

We consider first the degree to which employees are recognised and rewarded for being creative. From Figure 16, we observe that employees in the transport and manufacturing sectors are the least likely to be rewarded for their creativity. This may act as a barrier to creativity and innovation, as employees may not be incentivised to think and act beyond their formal job specification. This strongly contrasts with the education and hotels/retail/catering sectors where there is, on average, strong agreement with the notion of rewarding creativity and innovation.

16. Employees recognised and rewarded for being creative, by industry

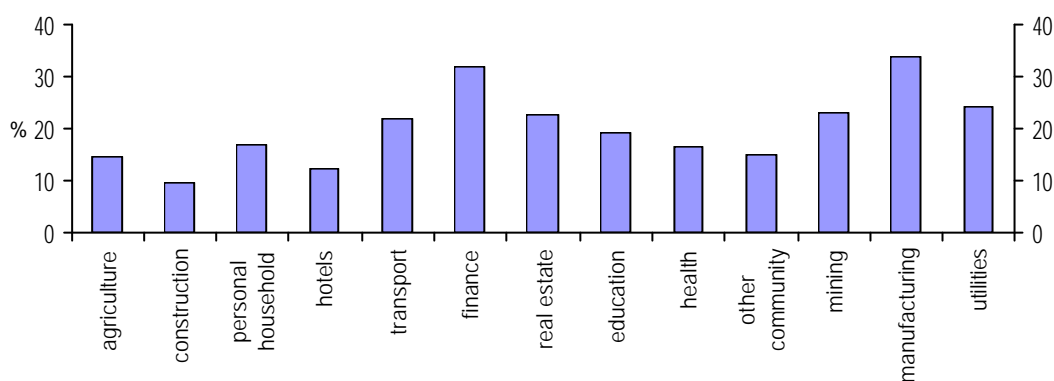


Source: The Work Foundation. Firms were asked if their employees were recognised and rewarded for being creative. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Having considered the degree to which employees are rewarded for being creative, we move on to consider the vintage of technologies typically used by businesses. In terms of developing brand new technologies in-house, a key indicator of innovative behaviour, Figure 17 shows that in the UK as a whole, 20.5 per cent of businesses are actively developing their own new technologies. Once again we note that there is significant variation across industries, with manufacturing and finance well above the

all-industry average and construction, retail/hotels/catering, agriculture and other community well below average. These findings can be interpreted in several ways. It may be the case, for example, that in certain sectors businesses need to be continually innovating and developing, or at least using the latest technologies so as to maintain their competitive advantage. It may also be the case that in certain sectors innovation and the development of new technologies are concentrated in a few businesses. These technologies are then diffused to other businesses in the sector. If, alternatively, there is a technology gap – in the sense that a large section of the business community is not using or developing new technologies – then it is very unlikely that these businesses will be at operating at their full potential. As such, these businesses will be acting as a drag on productivity growth in the economy.

17. Proportion of businesses developing own technologies, by industry

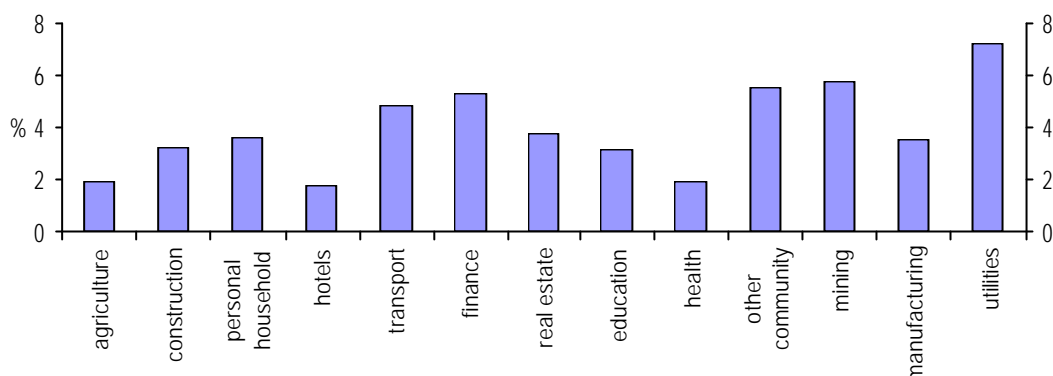


Source: The Work Foundation.

The ability to provide products and services that are created using new technologies is an indicator of future outward shifts in the production frontier, as new technologies enable goods and services to be provided more efficiently, thus enhancing the volume of outputs that can be produced with a fixed level of inputs. It is also the case that new technologies make it possible to create entirely new products and services which were hitherto unable to be provided to customers, thus increasing consumer choice.

Figure 18 highlights the industry variation in total sales accounted for by new technology-based products and services. The all-sector average is 3.76 per cent of total sales. This masks some substantial differences across industry sectors. For example, the share in utilities is nearly twice the all-industry average at 7.22 per cent. The shares in mining, other community and transport are all high.

18. Proportion of total sales accounted for by new technology-based products/services, by industry



Source: The Work Foundation.

This strongly contrasts with the shares in hotels, health and agriculture, all with shares below two per cent of total sales. A pair-wise correlation between the new technology-based product/services share of sales and businesses actively engaged in R&D shows a positive and highly significant association.⁸

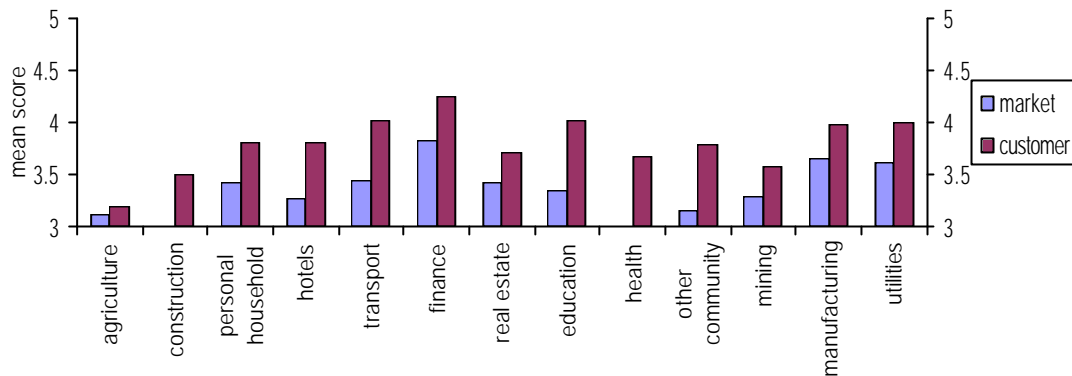
From these items (excluding our final performance variable) we can develop an Innovation Index using the methodology adopted previously. We note that of the 21 correlations, seventeen are positive and, of these, thirteen are significant at the one per cent level. Four were negative but not significant. To test for reliability of the items that form our Innovation Index we calculate the Cronbach's alpha. In this case we are left with three items.⁹

Next, we present our data on a wide range of issues surrounding how the business interfaces with customers and markets. For example, we consider the extent to which businesses network within their industry. We also explore issues concerning product/service diversity. Further, we consider the extent to which businesses collect market and customer intelligence.

⁸ Pair-wise correlation: 0.111***

⁹ The scale derived from our index appears to work well: the estimated correlation between it and the underlying factor item measures is 0.83, and the estimated correlation between this battery of three items and all other three item batteries from the same domain is 0.69. Test denotes the additive scale, here 0.43, which is the average inter-item correlation and 0.69 is the alpha coefficient for a test scale based on all items. All items are positive.

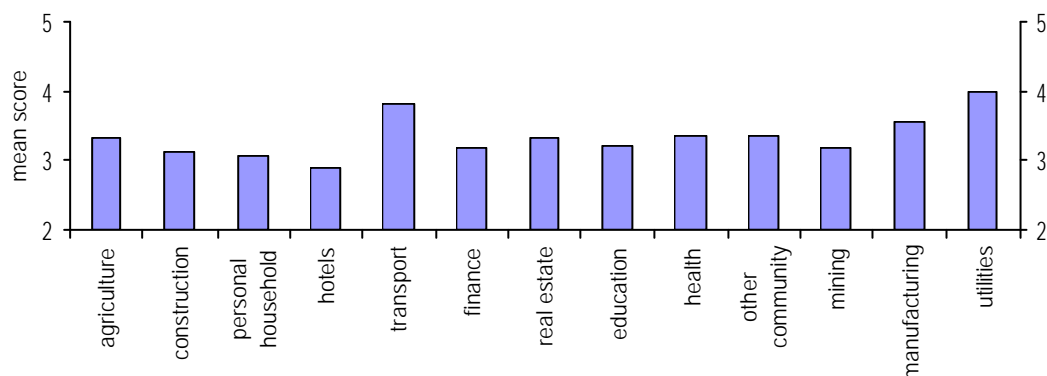
19. Business collects detailed market data and customer intelligence, by industry



Source: The Work Foundation. Firms were asked whether they set great store by collecting detailed market data/customer intelligence. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

As Figure 19 shows, businesses are, on average, likely to put great store on the collection of detailed customer intelligence; business are less likely to collect detailed market intelligence. Indeed, 34.38 per cent of businesses do not view collecting market intelligence as important. This compares to only 23.51 per cent for customer intelligence. In terms of market intelligence, businesses in finance, manufacturing and utilities appear to put great emphasis on the collection of detailed information. By comparison, businesses in the health and construction sectors place much less emphasis on the collection of detailed information. In terms of customer intelligence, businesses in finance, transport, education, manufacturing and utilities place more emphasis on collecting detailed information about customers, while businesses in agriculture place relatively little importance on customer intelligence.

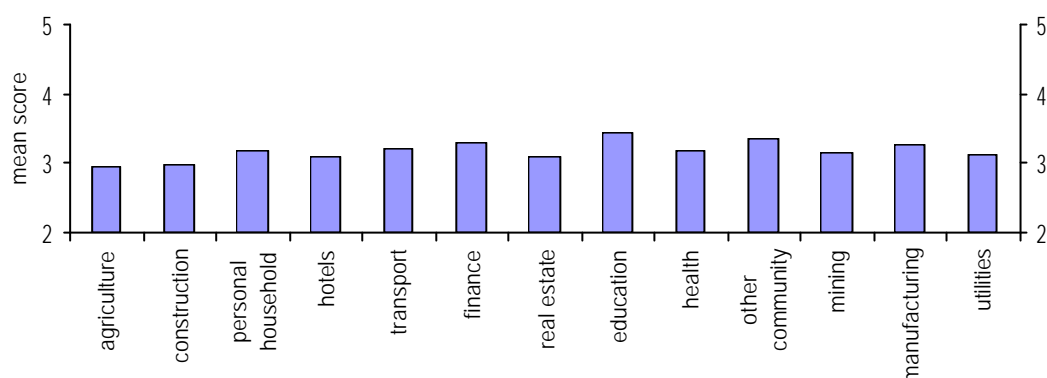
20. Business networks with other businesses in the same sector, by industry



Source: The Work Foundation. Firms were asked if they networked with other firms in their industry sector. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

In terms of the strategic importance placed on business networking in a given industry, we observe in Figure 20 that, again, there is some variation across sectors. In general, networking is seen as being of relatively low importance with a mean score of 3.28, indicating businesses are, on average, fairly neutral on this issue. Overall, 58 per cent of businesses view industry networking as strategically important. Sectorally, we note that businesses in the utilities and transport sectors place the most emphasis on networking. Businesses in the retail/hotels/catering sector place the least emphasis on networking.

21. Innovative ways of delivering products/services to customers, by industry



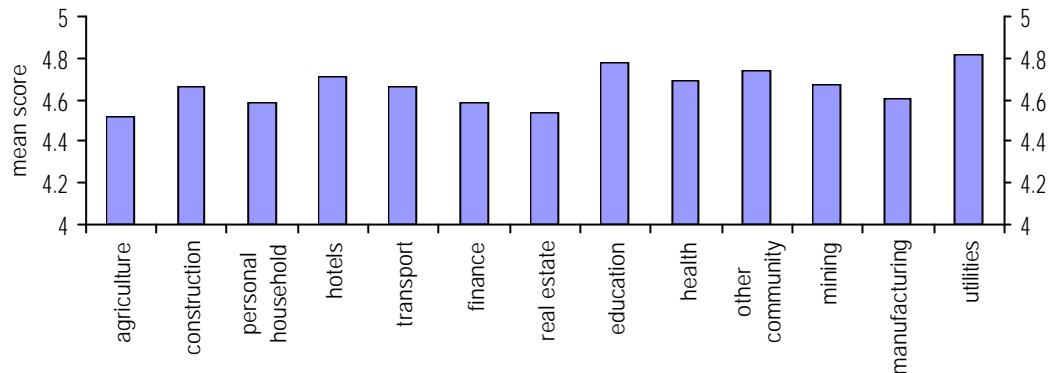
Source: The Work Foundation. Firms were asked if leading the way in terms of innovations in the way products or services were offered or delivered was important to them. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Focusing on new and innovative ways in which to deliver products and services to customers is one way in which businesses can differentiate their output from that of their competitors, as well as potentially enhancing the customer experience, and reducing sales costs. Here, we observe that there is tremendous variation across industry sectors, as Figure 21 shows. For example, in education, other community, finance and manufacturing, businesses perceive innovative methods of delivery to be of higher strategic importance than in other sectors, most notably agriculture and construction. Overall though, new and innovate means of delivery do not rate particularly highly on the strategic radar of UK businesses.

We attempted to develop a Customers and Markets Index using the items reported above. While we initially observed that, out of 15 correlations, 10 were positive and significant while three were negative and significant, it proved difficult to generate a superior index (using the alpha score as the only indicator of reliability) than one containing our two market and customer intelligence items. This index generated an alpha score of 0.73.

In this sub-section we consider how businesses interact with other stakeholders. Specifically, we consider businesses' approach to employee relations, environmental issues, the local community and wider social responsibilities. Figure 22 presents the findings for businesses approach to employee relations, disaggregated by industry sector.

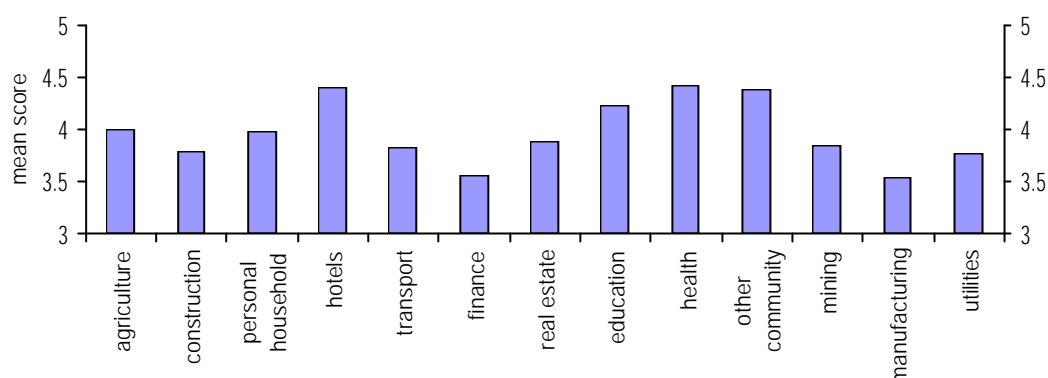
22. Business has positive approach to employee relations, by industry



Source: The Work Foundation. Firms were asked if they had a positive approach to employee relations. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Concerning employee relations, we note that the mean score for all businesses is 4.63, indicating that most businesses take employee relations very seriously. However, despite the generally high scores, we also observe a significant level of variation across industry sectors. For example, in the utilities, education and other community sectors, businesses have the most positive approach to employee relations. This contrasts with a comparatively less positive approach in the agricultural, real estate, finance and personal household sectors.

23. Business engages with the local community, by industry

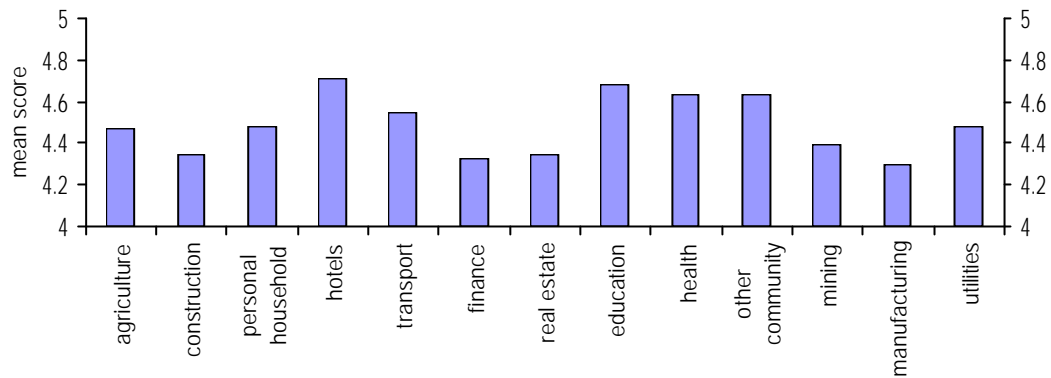


Source: The Work Foundation. Firms were asked if they engaged with the local community. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

From Figure 23 we observe that, in general, levels of engagement with the local community are high. But in manufacturing, finance, construction and transport mean scores are well below the all-industry average, and significantly below those recorded in retail/hotels/catering, health, education and other community. This former group of sectors, possibly with the exception of finance, are potentially those with a high level of impact on the communities in which they operate, thus implying that more engagement with their local communities might be appropriate.

In terms of wider social responsibilities, Figure 24 highlights some very significant disparities across industry sectors in terms of the seriousness with which businesses tackle these issues. For example, in construction, real estate, mining and manufacturing social responsibility is deemed of less importance, comparatively, than in other sectors, particularly retail/hotels/catering, education, health and other community. Once again, we might suggest that the former sectors are those that, potentially, can have a very significant impact on the social welfare of communities.

24. Business takes its social responsibilities seriously, by industry



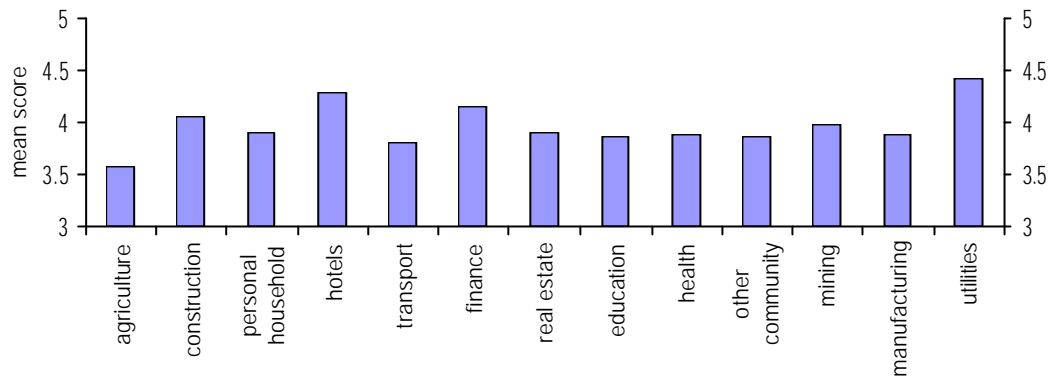
Source: The Work Foundation. Firms were asked if they took their social responsibilities seriously. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

From our four (employee interaction, local community, wider social responsibilities and environmental responsibilities) items we develop a Stakeholder Index using the standard methodology. Assuming that high correlations between variables (items) are indicative of complementarities, we note that of the six correlations, all six are positive and significant at the one per cent level. The scale derived from our index appears to work well: the estimated correlation between it and the underlying factor item measures is 0.80, and the estimated correlation between this battery of four items and all other four-item batteries from the same domain is 0.64.¹⁰

In this sub-section we explore a number of issues surrounding the investment community and financiers. Specifically, we present evidence concerning businesses ability to provide competitive returns to shareholders, the extent to which share options might be taken up if offered, general external regard for the business by the investment community, and the extent to which shareholders actively participate in strategy formulation.

¹⁰ Test denotes the additive scale, here 0.31, which is the average inter-item correlation and 0.64 is the alpha coefficient for a test scale based on all items. Sign shows the direction each item variable entered the scale, here all items are positive.

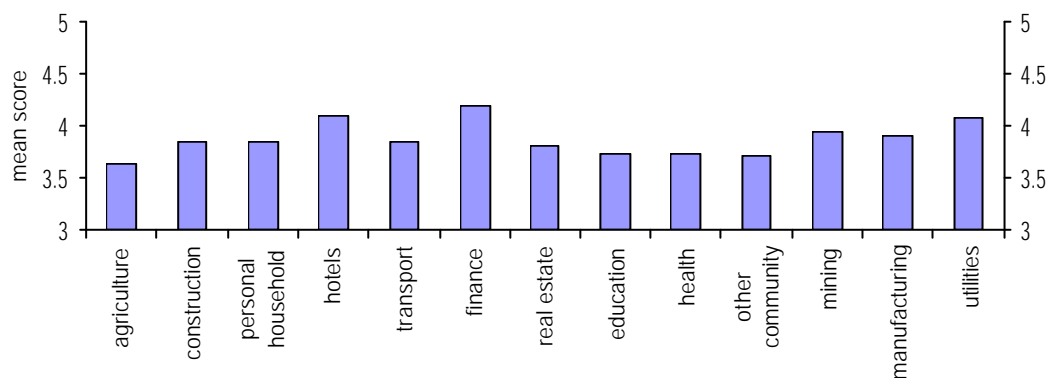
25. Would take up share option if offered, by industry



Source: The Work Foundation. Interviewees were asked if they would buy shares in their employer if they were offered. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

In terms of the potential take-up of share options, an increasingly-used response to principal-agent problems between shareholders and senior managers, we observe in Figure 25 that businesses in the agricultural sector are least likely to take-up share options, if available. This contrasts with very high scores from businesses in the utilities, retail/hotels/catering and finance sectors. This strongly suggests that executives and managers in different sectors need to be motivated in different ways to align shareholder and managerial interests.

26. Business well regarded by investment community, by industry

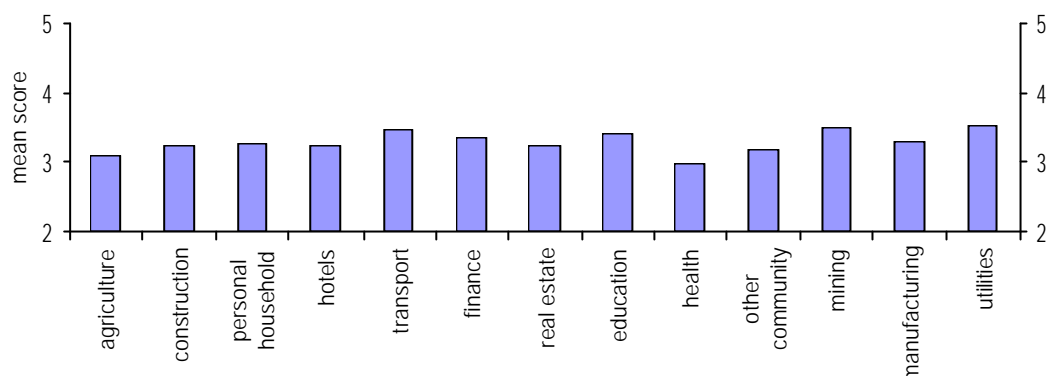


Source: The Work Foundation. Interviewees were asked if their firm was well regarded by the investment community and their financiers. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Figure 26 shows how businesses perceive themselves to be regarded by the wider investment community. Here again, we note that agricultural businesses have the lowest average score, implying that this sector is held in poor regard by potential financiers. The agricultural sector compares

particularly unfavourably with finance, retail/hotels/catering and utilities, all sectors where executives also indicated a high willingness to take up share options, if available.

27. Shareholders participate in strategy formulation, by industry



Source: The Work Foundation. Interviewees were asked if their shareholders and financiers actively participated in strategy formation. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Finally, in Figure 27 we observe some substantive differences in the extent to which shareholders actively participate in strategy formulation. Businesses in health and agriculture were the least likely, on average, to have active shareholder involvement in strategic decision-making. The difference is most marked when compared to the very high average scores in the transport and mining sectors.

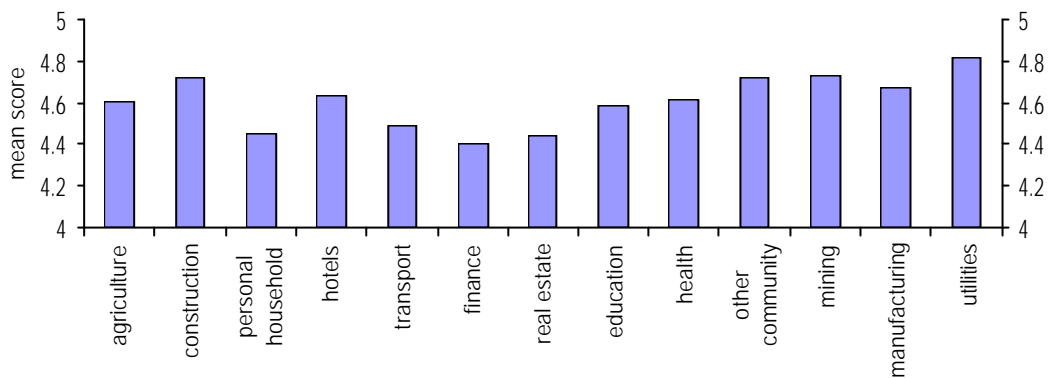
From these four items we can develop a single Shareholder Index using the standard methodology. Assuming that high correlations between variables (items) are indicative of complementarities, we note that of the six correlations, all six are positive and significant at the one per cent level. The scale derived from our index appears to work well, with the estimated correlation between it and the underlying factor item measures being 0.83, and the estimated correlation between this battery of four items and all other four item batteries from the same domain is 0.70.¹¹

In this sub-section we present our evidence on the relationship between businesses and a number of aspects relating to health and safety. The issues we deal with are, whether health and safety is seen as a strategic activity, whether investment in health and safety is seen as being cost-positive in terms of improving the bottom line, whether it is dealt with at board level, whether it is seen as being a part of good people management and the degree to which employees have autonomy to act on issues relevant to their health and safety.

¹¹ Test denotes the additive scale, here 0.36, which is the average inter-item correlation and 0.70 is the alpha coefficient for a test scale based on all items. Sign shows the direction each item variable entered the scale, here all items are positive.

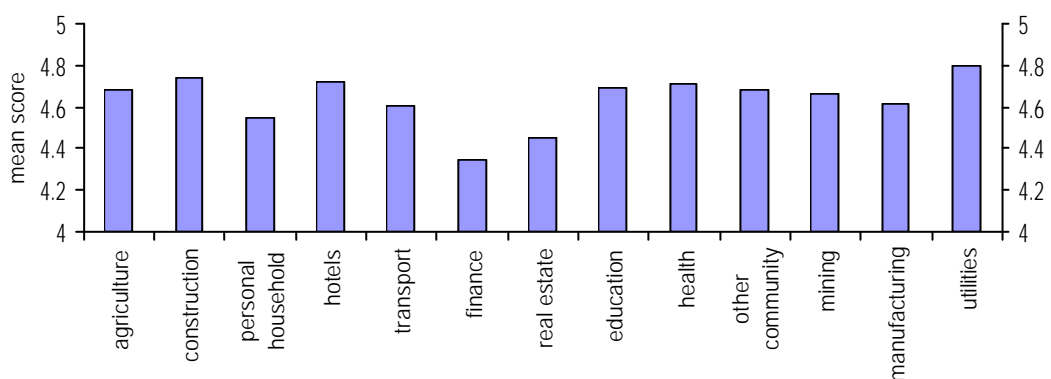
In terms of whether or not there is a commitment to health and safety at the board level, we observe in Figure 28 that commitment is relatively low in four sectors: personal household, transport, finance and real estate. This commitment is well below that reported in construction, other community, mining and utilities and implies that there is less leadership on health and safety issues, and less willingness to accept responsibility for poor health and safety in these four sectors.

28. Board level commitment and responsibility for good health and safety record, by industry



Source: The Work Foundation. Interviewees were asked if there was board level commitment and responsibility for the health and safety record of their business. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

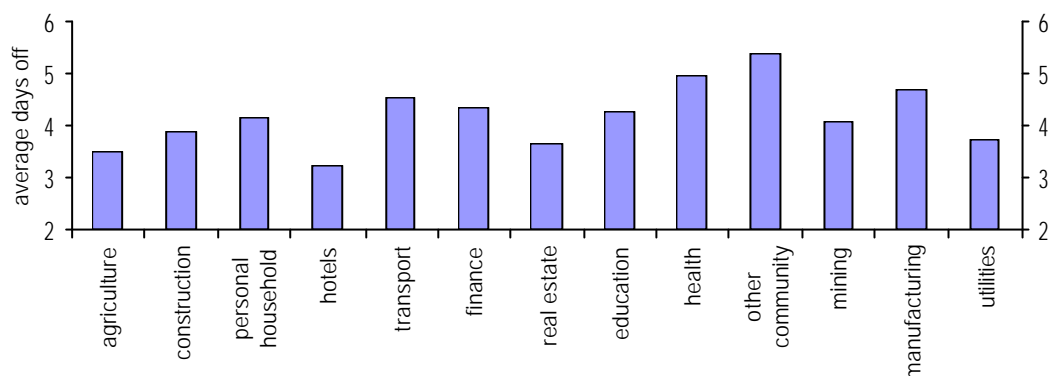
29. Health and safety is critical to good people management, by industry



Source: The Work Foundation. Firms were asked if they saw health and safety as a critical part of good people management. 1 indicates strong disagreement and 5 indicates strong agreement. It follows that the mean score must fall between 1 and 5.

Not surprisingly, these very same sectors are also least likely to view health and safety issues as being a part of good people management, as Figure 29 shows. This compares very unfavourably with the level of agreement with this association in the construction, retail/hotels/catering, education and utilities sectors.

30. Average number of days off due to illness or injury per annum, by industry



Source: The Work Foundation.

Finally, we present hard evidence concerning the number of days lost through employee absence due to illness or injury in Figure 30. The average employee in our sample lost 4.15 days in the last year. This equates to 2,486 days off for the average business in our sample. If we multiply this by the median wage per employee, the total cost to the average business is £153,247 per annum or, put alternatively, a loss of nearly seven full-time employees for a whole year.

From Figure 30, we observe that employees in the health, other community and manufacturing sectors, on average, have the most days off due to illness or injury and those in retail/hotels/catering, agriculture and real estate, the least. A correlation between average days off per employee and our five health and safety items shows that four are highly significant at the one per cent level (health and safety is a strategic activity, health and safety cost positive, board commitment and part of good people management). Employee empowerment shows no significant association.

From these five items we can develop a Health and Safety Index using the methodology adopted previously. Assuming that high correlations between variables (items) are indicative of complementarities, we note that of the 10 correlations, all 10 are positive and significant at the one per cent level. To test for reliability of the five items that form our Health and Safety Index we calculate the Cronbach's alpha. This assesses the reliability of a summative rating scale of the five items specified. The scale derived from our index appears to work well, with the estimated

correlation between it and the underlying factor item measures being 0.91 and the estimated correlation between this battery of five items and all other five item batteries from the same domain is 0.83.¹²

¹² Test denotes the additive scale, here 0.50, which is the average inter-item correlation and 0.83 is the alpha coefficient for a test scale based on all items. Sign shows the direction each item variable entered the scale, here all items are positive.

6. Analysis of business performance

This section considers an array of business performance measures. To get as full a picture as possible 13 alternative measures, both 'hard' and 'soft', are included. The approach is to estimate, within a multivariate framework, the impact of management strategy, and particular bundles of strategic issues, on performance while at the same time holding business characteristics (age, sector, legal status, etc.) constant. Performance is, therefore, modelled as a function of management strategy, business specific characteristics and geographical region:

$$\text{Performance} = F(\text{strategy} + \text{business specific characteristics} + \text{region}) \quad (6.1)$$

The measures of performance used can be broadly categorised as either 'hard' or 'soft'. The 'soft' performance measures relate to survey items (variables) in which the management are asked to subjectively benchmark their firm's performance against their industry sector. The hard performance measures refer to measurable items.

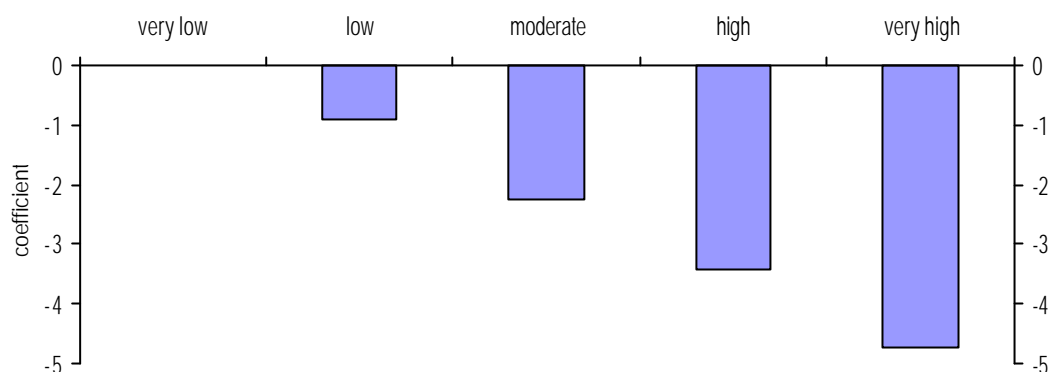
Table A4, Annex A, lists each of the 13 performance measures alongside the key indicator, or so-called 'item', used in the analysis. In what follows, we discuss these in more detail.

Business above industry innovation benchmark

The analysis of the survey findings shows that around 13 per cent of businesses reported that they were below the industry innovation benchmark. Nearly 39 per cent said that they were at, but not above, the industry benchmark standard and just over half (51 per cent) said that they were above the industry benchmark, although the majority of these businesses indicated that they were not far above it.

The econometric analysis, more details of which can be found in model (1), Annex B, showed that the subjective assessment of company performance against the industry innovation benchmark was a fundamental determinant of whether or not businesses were capable of achieving this standard (i.e., how high the industry benchmark was strongly impacted on the ability of businesses to achieve this level).

31. The effect on industry innovation levels on business innovation



Source: The Work Foundation. The coefficient on 'very low' has been normalised to zero.

Figure 31 shows that there is a negative relationship between the overall level of innovation in an industry and employers' subjective assessments about whether they achieve that standard. The more innovative the industry sector, the more difficult it is for businesses in that sector to keep up. This suggests that as the industry sector benchmark rises (for example as the result of a one-off change in technology), the more difficult it will become for businesses within that sector to keep up to the benchmark and remain competitive.

There were clear regional effects here. For example, businesses located in London were the most innovative. These were followed closely by businesses in the South East. Businesses in the North East lagged substantially behind. This suggests that there is something peculiar about, first, the North East, which results in businesses in this region struggling to keep up with sector-wide innovation and, second, London and the South East, with their high level capacity to innovate.

Businesses in the retail/hotels/catering and personal household sectors are substantially less likely to keep up with industry innovation standards than businesses in other industry sectors. The level of innovation in the personal household sector is around the UK average, while the retail/hotels/catering sector is below the average, even though the innovation benchmark for this sector is low compared to other sectors. This suggests that in this relatively poor performing sector (at least in terms of innovation), businesses still struggle to keep up with the benchmark. This may be because there are few innovation champions within the sector to set the standard and, as a consequence, there is a relatively high proportion of much less innovative businesses.

In terms of technology usage, businesses that use new technologies (either developed in-house or bought in at an early stage) were significantly more likely to be up to the industry standard than those who

use tried and tested combinations of existing technology. Further, businesses that buy in technologies at an early stage are more likely to be above the industry innovation benchmark.

Perhaps surprisingly, size of business was not found to be an important determinant of innovation compared to the industry standard. This might suggest that smaller businesses are not overly constrained in terms of facing more significant barriers to innovation. Equally, businesses' attitude towards risk was not seen as important, suggesting that innovation does not necessarily imply risk-taking. Neither the age of the business or nor its legal status were not found to be important. This suggests that there is no liability of newness, in terms of ability to innovate. However, it is clear that multi-establishment businesses have superior innovation performance than single-site businesses.

HR practices and performance-related pay coverage do not appear to motivate employees to be more innovative. Labour quality, as measured by average wage, plays no role, implying that higher quality workers do not necessarily lead to higher innovation levels. However, businesses that invest in training are significantly more likely to have superior innovation performance.

Intensity of industry sub-sector competition was found to have a significant positive influence in stimulating higher levels of innovation, establishing a positive link between innovation and competition. Networking was not found to be important alongside product/service diversity, suggesting that there are few knowledge spillovers within businesses or within industry sectors or sub-sectors that result in higher levels of innovation.

Turning to the effect of the six-indices (Shareholder, Stakeholder, Innovation, People, Health and Safety and Customers and Markets) and the three components of the Innovation Index, only the financial reward component proved significant and then in the opposite way to what had been expected – financially rewarding creative employees had a depressing effect on innovation performance, suggesting that creative people need to be rewarded in different ways.

The Innovation Index, however, was found to have a positive and highly significant impact on the level of innovation. The Stakeholder, Customers and Markets, and People Indices also had a significant impact, although the order of magnitude was less, substantially so in the case of the Customers and Markets and Stakeholder Indices.

Business attracts good quality employees

The survey findings show that just over 11 per cent of businesses said that they found it very difficult to attract good quality employees from other businesses in their industry. A further 12 per cent found it fairly difficult. Around 34 per cent found it very easy to attract good quality employees, and 31 per cent fairly easy. Around one quarter of businesses are, therefore, finding it difficult to employ people with industry knowledge and the requisite skills.

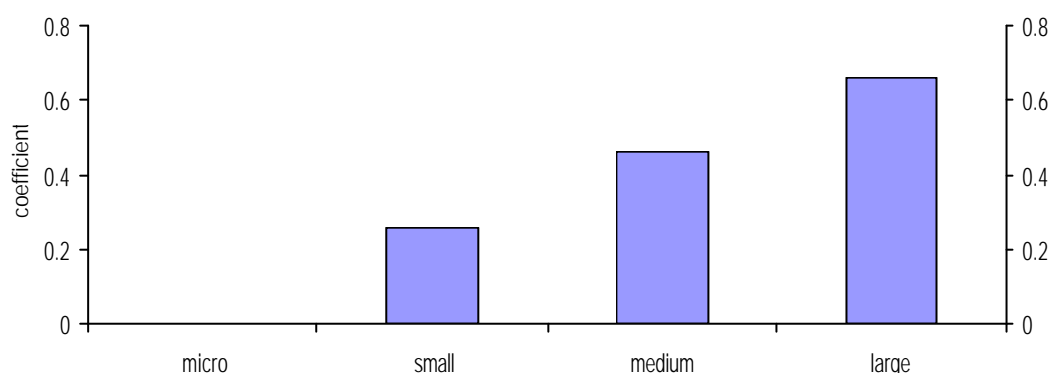
The econometric analysis, more details of which can be found in model (3), Annex B, focuses on the characteristics of businesses that find it

relatively easy or difficult to attract quality employees. The particular interest here was on people management strategies and practices. The method we adopt, as previously, is an ordered probit which takes into account the nature of the variable which is ordered on a scale of 1 to 5, with 1 indicating strong disagreement (i.e., very difficult to attract good quality employees) and 5 indicating strong agreement (i.e., very easy to attract good quality employees).

This showed that the East of England had significantly more businesses that were finding it difficult to attract good quality employees from within their industry. In terms of sectors, businesses in the transport sector found it significantly easier to attract good quality employees than those in any of the other industry sectors.

Single-site businesses found it easier to attract good quality employees. Age of business, legal status and VAT registration, however, were not found to have any significant impact on the ability to attract good quality employees. Size of business, however, was found to have a very significant role.

32. Business size effects on ability to attract good-quality employees



Source: The Work Foundation. The coefficient on 'micro' has been normalised to zero.

Figure 32 clearly illustrates that the ability of a business to attract good quality employees from other businesses within its industry increases in a linear fashion with the size of the business. That is, the bigger a business is, the easier it is for that business to attract employees from other businesses within the same industry sector. This suggests that smaller businesses are at a relative disadvantage in attracting new employees from within the industry sector. At first glance one might assume that this is because larger businesses pay higher wages (an established fact). However, the econometric model included a wage variable, which was not found to be significant. It would appear, therefore, that the size effect is unrelated to wages, which in turn were not found to be a key factor in attracting good quality employees to a business. The share of part-time employment in total employment appeared to play no role, suggesting that flexible employment opportunities were not a particularly strong

element in attracting new employees (or that these features were not being captured accurately by the model).

Businesses with higher proportions of employees on a performance-related pay system (PRP) were significantly more likely to find it easier to attract new employees from within their industry. This suggests that basic pay may be less of an influence on employees' decisions to move within an industry sector than the opportunity to be rewarded in line with their efforts and productivity.

In contrast, having a multi-tasking workforce or conducting annual individual performance reviews reduced businesses' ability to attract quality employees when implemented in isolation rather than as a consistent package of HR practices. On the other hand, having an integrated and complementary system of HRM and people management strategy was found to have a significant positive impact on a firm's ability to attract good quality employees from within their industry and was the most significant indicator in the People Index. Here again, the evidence suggests that it is coherence within key areas of strategic decision-making that matters, particularly with respect to people and employment.

Innovation was also found to play an important role here, both in terms of individual strategic choices and in terms of adopting a systematic and complementary approach to technology and innovation. The Innovation Index had a positive and significant bearing on the ability to attract quality employees. Businesses using up-to-date technologies also found it easier to attract employees from within their industry, as did R&D active businesses.

Finally, businesses placing greater strategic emphasis on customers and markets also found it easier to attract quality employees as our Customer and Market Index acted in a positive and significant way, albeit with a smaller impact than either our People or Technology Indices.

The ability of businesses to attract good quality employees from other businesses operating within their industry sector is strongly related to good people management and HRM practices, particularly if presented as a coherent strategy. This is also true for innovation and technology, where being innovative and keeping up-to-date with new technological developments enhances the pool of potential employees. Here the best results are achieved by having a systematic and complementary approach to strategic decision-making. The size effect is significant which highlights the great difficulty smaller businesses have in attracting good employees, although this appears to be unrelated to the absolute wage differential between small and large businesses, and might, to a degree, be redressed by smaller businesses expanding PRP coverage amongst their employees.

Market position relative to competitors

Turning to the market position of a business in relation to its competitors, the econometric analysis, more details of which can be found in model (4), Annex B, shows that there are strong industry sector variations, with businesses in the financial services sector finding it most difficult to maintain a competitive market position. This contrasts with businesses in real estate, education and other community, who find it comparatively

easy to maintain a strong position in their market. Here, there is no regional variation, suggesting that geographical location does not prevent businesses from competing effectively.

Businesses using new technologies, whether developed in-house or bought in at an early stage, find it easier to compete in their markets. This confirms the positive link between innovation and competitiveness. Further, the more competitive the industry sector, the stronger businesses are, suggesting that competition promotes a virtuous circle where businesses have to keep up with the industry standard or perish. This is important, as age or size of business do not appear to be important factors. Thus, a business operating in a highly competitive market, using new technologies, and irrespective of age and size, will tend to be more competitive than a business operating in a market shielded from competition using more established technologies.

Three of the six strategy indices were found to have a positive and statistically significant impact on market competitiveness, (while a further two were just outside the bounds of conventional statistical significance tests). Shareholder focus has the largest effect, slightly above that reported for stakeholder focus. Businesses with a strong focus on customers and markets also tended to provide more effective market competition. These findings generally support the view that better-performing businesses are the ones who take a systematic and complementary approach to strategic decision-making within and across functional areas.

Average days lost through illness or injury per employee

The findings show that, on average, each employee loses 4.15 days per annum in absence from the workplace through illness or injury. The median is three days suggesting that there is a small subset of businesses having very high rates of absence. As reported earlier this equates to 2486 days off for the average business in our survey. Multiplying this figure by the median wage per employee, the total cost to the average business is £153,247 per annum, or, put alternatively, a loss of nearly seven full-time employees per year. The analysis now turns to the determinants of employee absence from work.

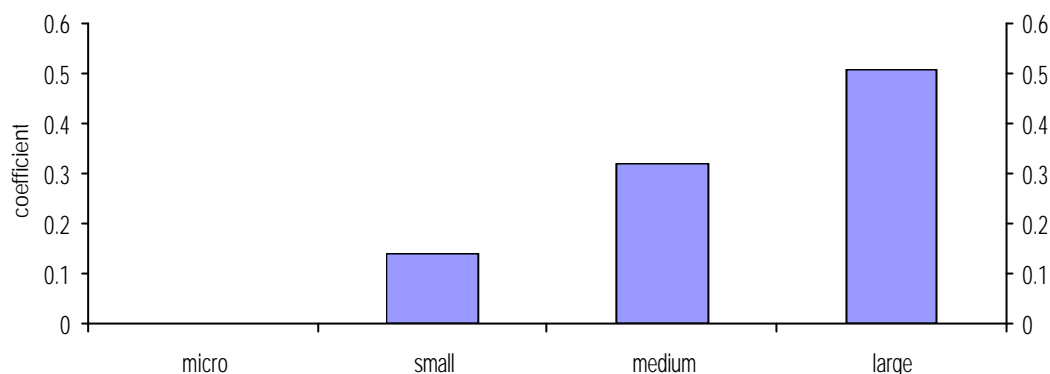
As the dependent variable here, average days absent per employee, is a continuous variable we choose to estimate our equation using Ordinary Least Squares (OLS) correcting for heteroskedasticity.

It might be expected that people management and HRM practices play a key role in regulating employee absence from work and will have a significant impact on the number of days taken off, at both the individual and aggregate level.

The econometric analysis, more details of which can be found in model (5), Annex B, shows that businesses located in the North East and Scotland have the lowest absence rates, with the former being particularly

low. It also shows that businesses operating at a single-site have lower absence rates, although the scale of this effect is much less than the regional effects.

33. Business size effects on average number of days absence per employee



Source: The Work Foundation. The coefficient on 'micro' has been normalised to zero.

The results point to a significant and consistent pattern related to business size. Figure 33 shows the coefficients for days' absence per employee, arbitrarily setting the coefficient on micro businesses to zero. This shows that the larger a business is, the more days' absence, on average, an employee will take off from the workplace. While it might be argued that the loss of an employee through absence is less of a concern for large businesses, the actual and relative cost to large businesses of higher absenteeism rates is nonetheless very significant.

There is also a positive and statistically significant effect from the share of part-time employment in total employment on absenteeism – showing that the larger the share of part-time employment, the larger the average number of days' absence. The coefficient, 0.29, implies that a one unit increase in the share of part-time employment in total employment will increase average days' absence by 0.3 per cent, although this can realistically be viewed as representing the elasticity around the mean for part-time employment share, which is 18.9 per cent. This suggests that there are costs associated with businesses having flexible working arrangements in terms of increased absence from work due to sickness and injury.

Sales of new technology-based products and services

The ability of businesses to sell products and services that use technologies developed in the last 12 months can be regarded as an indicator of a firm's potential growth and profitability in the future, as new markets develop and established products begin to be replaced by new and technologically superior ones.

One issue we address here is whether only the most capable businesses actually create and sell new technology-based products or whether the

decision is made randomly by businesses regardless of their relative capabilities. The former might, *a priori*, be more intuitive as there are likely to be substantial, sunk costs associated with the decision to engage in new product or service development that can only be recouped if sales exceed a certain threshold. In this case, if predicted sales fall below this threshold, businesses might choose not to engage in new product/service development in the first place. These concerns can be addressed through econometric analysis by adopting the two-step modelling procedure proposed by Heckman. In brief, we estimate two equations. The first is basically a binary probit model with the dependent variable expressed as 1 if the business has any new technology-based sales and 0 otherwise (see model (2a), Annex B). The second equation is estimated only for those businesses that had any new technology-based sales in step 1, and estimates the importance of new technology-based sales in total sales for these businesses only (see model (2b), Annex B).

For our step 1 model, we observe that businesses operating in the most highly innovative industries have a higher propensity to sell these types of products/services. This suggests that businesses operating in very innovative industries are strongly influenced by competitive pressures to continually bring new products/services to market. Around 30 per cent of UK businesses are operating in industry sectors in the highest innovation level classification.

Businesses located in the South West were the least likely to have sales from new technology-based products. Businesses in Scotland were the most likely to have new technology-based sales, holding all other factors constant. In descending order of scale, utilities, personal household and construction were the most likely to make new technology sales. Overall, industry sector effects are statistically more significant than regional geography.

Small businesses (10-49 employees) were the least likely to have any new technology-based sales. Business legal status was also important – with public limited companies (Plc's) significantly more likely to have new technology-based sales. This may be related to the ability of Plc's to raise or leverage venture capital or loans to support new product/service development through external equity markets. It is noteworthy that this legal status effect holds regardless of business size. Age of business did not have an impact, suggesting that younger businesses are not facing binding constraints in terms of new technology-based product/service development.

Businesses with an explicit shareholder, growth and stakeholder objectives (in descending order of magnitude of importance) are more likely to have new technology-based sales. This is consistent with long-run profit maximisation and the need to capture new markets to facilitate this. The stakeholder result is more interesting and might suggest that social distance to external agents might, in fact, be a valuable source of new ideas or different applications of existing technologies that can then be translated into new products and services.

Looking at more traditional and basic technological inputs, such as R&D, the analysis shows that R&D active businesses are significantly more likely

to have new technology-based sales. Both businesses buying in early stage technology or developing their own in-house are more likely to sell new technology-based products and services. This suggests that the data are internally consistent, and further, that the hypothesised linkages between R&D and new technology usage, on the one hand, and bringing new products/services to market, on the other, are well supported by the analysis.

The econometric analysis shows three of our six strategic indices had an impact on new technology sales but only the People Index was positive while the Health and Safety Index and the Innovation Index had negative impacts. The results suggest that creating a climate in which employees are encouraged to be happy in their jobs and are more committed to the business will, as a by-product, stimulate a more creative and innovative environment.

Finally, we note that the sample selection term is significant and negative. This indicates that businesses that are likely to have any new technology-based sales are also those businesses where new technology-based sales form a large part of total sales. This suggests that offering new technology-based products/services is non-random and only those businesses with a unique advantage in this area will offer products/services to market.

Turning to the share of new technology sales in total sales, here the analysis is restricted to those businesses that were classified as making new technology-based sales. Here, two industry sectors, construction and personal household, were found to have a higher proportion of total sales from new technology-based products. The education sector was also found to have lower shares of new technology-based sales.

When looking at business characteristics, medium-sized businesses (50-249 employees) were found to be more likely to have larger new technology product/service shares than businesses in the other size bands. Small businesses were the least likely to have any new technology sales. Plc's were likely to have smaller new technology-based product share than private businesses, perhaps reflecting their strong presence in well-established core product markets where they are able to maintain high and stable market shares. Here, age of the business mattered, with older businesses reporting a lower proportion of total sales accounted for by new technology-based products. This suggests that it is younger businesses that are most capable of driving new product sales forward and turning new technologies into saleable products.

Businesses that buy in new, early stage, technologies tend to have higher sales share of products and services that use these new technologies. This contrasts with in-house technology development, which is associated with initial market entry, but makes no difference to market shares out of total sales. This might suggest that new, widely available technology has a legitimacy that bespoke, in-house technology does not when it comes to new product development. Also, risk-averse businesses tend to have a lower sales share of new technology-based products, suggesting that these businesses, while equally willing to offer new products to market,

may be reluctant to make a full commitment due to risk of failure. The analysis suggests that they are too timid in their assumptions and are losing out on a market opportunity.

Businesses with larger sales share of new technology-based products are also those with that score highly on our Innovation Index, and also those that score highly on our Customer and Markets index. Creating innovative people and innovation channels does not affect the initial decision to offer new products to market, but has a major impact on the sales intensity of new technology-based products once this decision has been made. Our evidence also suggests that closeness to external agents provides an important source of information relevant to new product development and sales. In short, intelligence matters when seeking to expand into new markets.

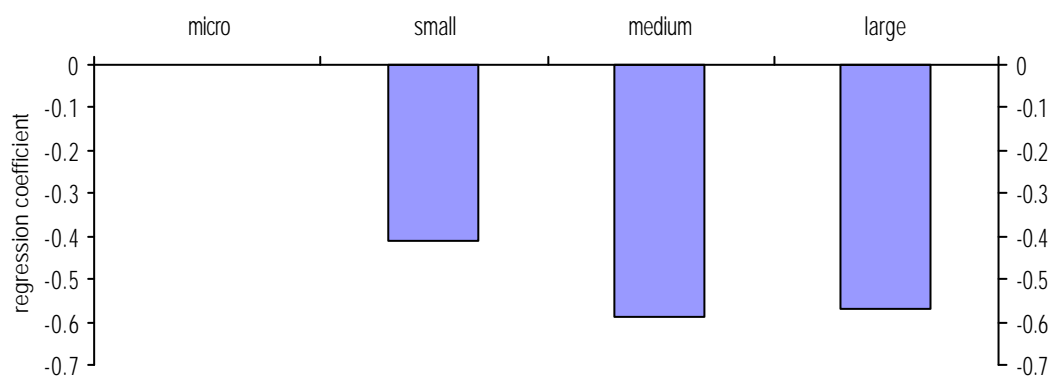
Employee commitment

The findings from the survey show that just over eight per cent of businesses had low-level employee commitment, around 20 per cent medium-level commitment and almost 72 per cent had high-level commitment.

The econometric analysis, more details of which can be found in model (6), Annex B, shows industry sector variation in employee commitment, with employees in the other community, health and real estate sectors having higher levels of commitment than those in any other sector. There is also a single regional effect, with employees in the South East being marginally more committed than those in other regions.

Single establishment businesses tended to have more committed employees, suggesting that there may be benefits to spatial proximity, regardless of establishment size. However, there was also a very strong and negative effect with the increase in business size. These findings suggest that larger businesses may have to pay more attention to employee engagement, particularly if they are operating multiple establishments.

34. Business size and employee commitment



Source: The Work Foundation. The coefficient on 'micro' has been normalised to zero.

Businesses with a higher part-time employment share have lower levels of employee commitment, suggesting some possible cause for concern about the trend towards non-standard employment observed in the UK and EU economies over the last 20 years. Lower levels of employee commitment might well be expected if the trend towards non-standard working continues.

In terms of the six strategic indices, three have a significant positive impact on employee commitment. They are: Stakeholders; Innovation; and People. The People Index has by far the greatest impact. However, for the most innovative businesses it is the presence of external stakeholders that has the greatest impact on employee commitment. The analysis also shows the level of employee commitment is higher when communication between management and employees is clear and functions well.

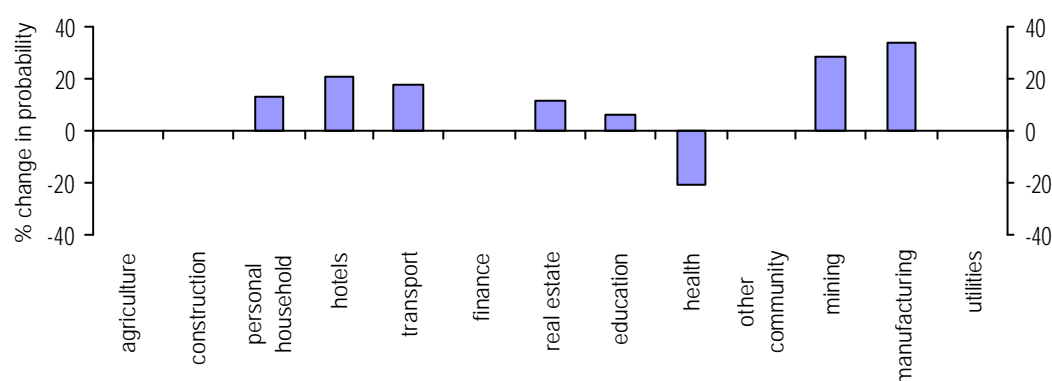
Exporting

Exports may also be important. See model (7a), Annex B, for the econometric analysis relating to exporting businesses.

Figure 35 illustrates the variation in businesses' propensity to export by industry sector.

This shows that businesses in manufacturing and mining have by far the highest propensity to export, holding all else constant, compared to businesses in agriculture, construction, finance, other community and utilities. Other sectors where businesses had a comparatively high propensity to export included retail/hotels/catering, transport, personal household, real estate and, to a lesser degree, education.

35. Exporting probability, by industry sector



Source: The Work Foundation. The base sector is agriculture.

In terms of geographical regions, businesses in Northern Ireland and London had significantly higher propensities to export than businesses located in any other region of the UK. The magnitudes were 25.7 per cent and 21.6 per cent, respectively. By comparison, age of business had no effect, suggesting again that there is no liability of newness effect as far as exporting is concerned. However, credibility and legitimacy appeared

to matter as VAT registered businesses were 11 per cent more likely to export, while public limited companies had almost a 13 per cent higher export propensity.

There are also clearly important technology and business size effects. Businesses developing their own technologies or buying in early stage technologies tend to have higher export propensities than those using existing technologies, with differences at 14.9 per cent and 9.5 per cent, respectively. The technology effect is re-enforced by the finding that businesses investing in basic R&D are also more likely to export. Medium-sized businesses are 12 per cent more likely to export and large businesses 17.5 per cent more likely.

Businesses that engage in networking activities are significantly more likely to export, as are those businesses that score highly on our Customers and Markets Index. Both of these variables indicate a degree of pro-activity, in the sense that businesses are getting involved in industry networks and also collecting very detailed market and customer information.

Exporting intensity

Here, the analysis concerns only those businesses that export. Export intensity is measured by the proportion of total sales accounted for by exports. Detailed results can be found in model (7b), Annex B.

Businesses located in Northern Ireland had the highest export intensity. There were also large industry sector effects with, in descending order of scale, businesses located in utilities, manufacturing, transport and education significantly more likely to have higher levels of export intensity. Public limited companies and very large businesses all had high export intensities.

Businesses using the most modern technologies, be they developed in-house or bought in, and those investing in basic R&D, all had higher export intensities. Further, the Innovation Index had a positive, statistically significant impact. This suggests very strongly that the initial entry into, and subsequent expansion and development of, export markets is dependent on a firm's ability to provide very up-to-date, technologically advanced products and services.

Networking is also associated with increases in export intensity, as is the age of the business. The age effect is linear, which implies that as businesses grow older they are able to sell more and more in export markets regardless of the age at which they first entered an export market, which appears random.

Business above industry skills benchmark

The first thing we note in model (8), Annex B is that no significant regional differences were evident in terms of the businesses above their industry skills standard. Two sectors, retail/hotels/catering and construction, stood out as sectors where most businesses managed to operate at the relevant skills benchmark for their particular industry

sector. There was also evidence to suggest that businesses with a high proportion of part-time employees were also more likely to operate at or around their industry skills benchmarks.

Few other effects were found to have a decisive impact on a firm's ability to operate at the relevant skills benchmark for their industry sector. However, four of our strategic management sub-indices did play a role, three in a positive way and one in a negative way in terms of being able to operate above or below the benchmark. The three sub-indices that had a positive impact were Health and Safety, Innovation and People. Only the stakeholder index was found to have a negative impact.

Sales change, 2001-2004

Model (9), Annex B shows that as far the percentage change in sales over a three-year period was concerned, only those businesses in the North East had high sales growth, some 3.03 per cent above the UK average of 15.45 per cent. Four industry sectors had significantly lower sales growth rates than the UK average – finance (-3.9 per cent), education (-3.2 per cent), utilities (-2.4 per cent) and personal household (-2.0 per cent).

Businesses developing their own technologies had higher sales growth. The older a business was, the stronger its sales growth, though product/service diversity was found to have a negative effect on sales growth over the period. Recognising that 2001 might be considered a period of relatively poor economic conditions, the analysis suggests that larger businesses, sticking to a smaller range of core, technologically advanced products or services were better able to take advantage of improving economic conditions over the following three year period.

To conclude, businesses scoring highly on our Shareholder Index and our People Index had higher sales growth, the implication being that a commitment to good employee relations and HR practices, combined with an equal commitment to creating shareholder value, resulted in better sales performance.

Performance summary

Having tested our six strategic indices against numerous measures of performance, we now summarise our findings. The top-line finding of our analysis, reported in Table A5, Annex A, is that our six strategic indices have a statistically significant, and positive, impact on performance in 23 out of a potential 72 cases.

In terms of the strategic indices that had the biggest impact, measured in terms of how many positive, significant effects were identified, we note that the People Index and the Customers and Markets Index were both associated with better performance in six out of 12 cases. Importantly, neither had any negative impacts. Next we found that the Innovation Index was associated with better performance in five out of 12 cases. The Shareholder Index and Stakeholder Index both had three positive impacts and the Health and Safety Index had just one.

In terms of how our strategic indices impacted on our array of 'hard' and 'soft' performance measures, we observe that there are some important differences. For example, four of our indices had an impact on

businesses' ability to keep up to their industry technology benchmark, whereas it was much more difficult to explain employee absence. It was also the case that different indices had different impacts. The People Index, for instance, tended to be more associated with better performance on measures capturing skills and technology related performance, whilst the Customers and Markets Index had a greater impact on measures like market position, exporting and new technology sales intensity. The Shareholder Index, by contrast, was associated with better performance on market position and sales growth. Thus, in general, we note that our strategic indices seem to have the greatest impact on the performance areas that we might have *a priori* expected, which is reassuring.

7. Productivity

Here we adopt a total factor productivity (TFP) approach to analysing productivity at the company level.¹³ The focus is on the effect of intangible assets such as human capital, strategy and corporate objectives on productivity. We combine standard analysis with survey-based information on governance, strategy and market positioning in an attempt to add to our understanding of the impact of intangibles on business performance. One specific innovation in our work is that we construct a series of strategic indices for six areas of strategic management (i.e., Shareholders, Stakeholders, People, Innovation, Health and Safety and Customers and Markets). We then create an overall index combining strategies across these six core business areas and test whether performing across all six areas simultaneously enhances productivity to a greater extent than pursuing individual strategies in isolation.

Previous research in this area has had a fairly narrow focus, typically focussing on human resource management (Ichniowski *et al*, 1997; Kelly, 1996; Arthur, 1994) or innovation (Artz *et al*, 2003; Verhees and Meulenber, 2004; Loof and Heshmati, 2002). Further, a plethora of performance measures have been used in previous research. Common performance measures include: sales growth (Gibbons and O'Conner, 2003; Artz *et al*, 2003; Ruf, 2001); the ratio of the return on investment to the return on assets, ROI/ROA (Matsuno *et al*, 2002; Balabanis *et al*, 1998; Delery and Doty, 1996); and profit (Wright *et al*, 2003; Homburg *et al*, 2002; Vazquez *et al*, 2001). We also found that researchers used an array of econometric models to investigate linkages. These include LISREL (Matsuno *et al*, 2002), OLS/GLS/3SLS (Artz *et al*, 2003; Verhees and Meulenber, 2004; Steven *et al*, 2003), panel data methods (Dewan and Kraemer, 2000; Vivero, 2002), PCA (Balabanis *et al*, 1998), factor analysis (Matear *et al*, 2004; 2002; Vazquez *et al*, 2001) and cluster analysis (Arthur, 1994; Macduffie, 1995).

For the purposes of this paper, we adopt a total factor productivity measure (commonly referred to as multi-factor productivity, MFP) that relates output to a bundle of inputs. Specifically, we adopt an MFP (KLEMS) measure that allows gross output to be determined by inputs of capital, labour, energy, materials and services. Throughout, the unit of analysis is the firm. Thus the goods/services produced by a firm for external use are our measure of gross output. The final gross output is produced using capital and labour (primary inputs) and intermediate inputs. Formally, this relationship can be written:

$$Y = H(A, K, L, M) \quad (7.1)$$

¹³ When discussing economists' concept of total factor productivity (TFP), the Work and Enterprise Panel of Inquiry adopted the DTI's definition of TFP as described in *Prosperity for All – The Strategy: Analysis*, London, URN 03/1273.

Here, the final gross output is given by Y . H is the production function. K , L and M are inputs into the production function corresponding to capital, labour and intermediate inputs, respectively. Technical change is captured by the term A in this expression. This parameter allows technical change to augment output (Hicks neutral) if this represents an outward shift in the production function that affects all factors of production proportionately. However, Kalirajan *et al* (1996) offer a note of caution here, arguing that the impact of technical progress is not, as is sometimes assumed, fully reflected in TFP. This is only the case if businesses always operate on their production frontiers, producing the maximum possible output or realising the full potential of the technology. If businesses do not operate on their frontiers, due to, for instance, organisational/strategic factors, then technical progress is not the only source of TFP growth. This is important for us, as we implicitly assume that strategic factors, which vary across businesses, have a direct impact on TFP, by improving the method of application of a given technology. Zwick (2002), for example, in a study of the effects of training on firm productivity, finds that businesses with an inefficient production structure deliberately use training in order to boost productivity.

In terms of inputs, labour is most appropriately measured in terms of quality-adjusted hours worked. The simplest, and often the most practicable, measure is a head count of jobs or employees. A refinement is to use full-time equivalents (FTEs) which avoids measurement bias resulting from part-time employment in the workforce (Schreyer and Pilat, 2001). We also estimate alternative measures of productivity using value added and value added per employee. This allows us to test the sensitivity of our findings to the choice of dependent variable.

Intangibles and productivity

There exists a body of research that builds on Solow's (1957) decomposition of economic growth and, specifically, on the factors that explain the productivity residual, or that part of output that is not related to changes in factor inputs (capital and labour). Economists have tended to focus on the relationship between R&D and productivity (Griliches, 1988; Coe and Helpman, 1995) and have generally found a significant and positive effect on output. A related body of work, building on endogenous growth theory, has tested for R&D spillovers via the diffusion of new knowledge (Griliches, 1992; O'Mahony and Vecchi, 2003).

Our work is broader in its focus and concentrates on the role of corporate governance and strategic decision-making in the determination of productivity, although we are also able to test for the impact of R&D and innovation proxies. This approach has its roots in human capital theory (Uzawa, 1965; Niman, 1991; Becker, 1964), in the sense that it is the superior decision-making capabilities of entrepreneurs and higher level executives that fundamentally determines why some businesses are consistently able to outperform their competitors over long periods of time (see Geroski and Jaqueman, 1988 and Geroski *et al*, 1997).

Our research is also complementary, and in some aspects overlaps, with the body of research analysing human resource management linkages with productivity and product quality emanating from the industrial

relations field (Macduffie, 1995; Ichniowski *et al*, 1997; Blatt, 1999; Kelly, 1996; Huselid and Becker, 1996; Arthur, 1994; Delery and Doty, 1996; Capelli and Neumark, 1998, Youndt *et al*, 1997; Orlando and Johnson, 2001). It also touches on research tackling issues such as governance (Cowling, 2003; Lehmann *et al*, 2004; Bhagat and Black, 2002), market orientation (Matear *et al*, 2002, 2004; Vazquez *et al*, 2001), corporate social responsibility (Balabanis *et al*, 1998; Ruf *et al*, 2001), and innovation systems (Dewan and Kraemer, 2000; Lee and Grewal, 2004; Vivero, 2002).

Sample statistics

Here we discuss our key variables of interest. These include the core elements in the traditional production function, namely output, labour, capital and intermediate inputs. We also discuss less tangible variables of interest, such as strategic orientation, business objectives and governance. This second group of variables is of particular interest to us as they have been identified from previous research as being influential in the determination of business performance. It is this group of variables which we later use to construct our composite strategy indices covering all six of our functional strategic decision-making areas, and which we subsequently test in our productivity models.

As we observe from Table A6, Annex A, the mean business in our sample had total sales of £27.7m per annum in 2004. The mean business employed 599 full-time equivalents (FTEs) and had £10.6m worth of capital. On average, the ratio of intermediate inputs to total sales was 23 per cent.

As our sample is representative of the size distribution of UK businesses (with the exception of the large business top-up sample), the median business is much smaller. The median business had total sales of £900,000, six full-time equivalents (FTEs), employed £17,000 of capital and had a materials to output ratio of 20 per cent. In terms of capital/labour ratios, the average for the whole sample was £175,429. It was highest in the real estate, renting and business services sector, at £229,721 per worker. This compares to £87,861 per worker in utilities.

Next we focus on business characteristics, specifically businesses' responses to our questions concerning managing people, shareholders, stakeholders, customer and markets, innovation and health and safety, discussed at length in chapters 4 and 5. One additional variable is included, namely the proportion of the workforce covered by performance-related pay.

We now turn our attention to the people function. We note here that, according to Table A6, Annex A, 96 per cent of businesses agreed that their workforce was skilled enough to compete in their industry sector. That said, only 76 per cent of businesses said that they were able to attract good quality employees from other companies in their particular industry sector. Some 75 per cent of businesses invest in workforce training to raise the skills of their employees. We also observe that 40 per cent of businesses recognise trade unions and 92 per cent are proactive in the context of employee relations. In addition, 93 per cent of businesses

ensured that their employees were empowered to act autonomously on health and safety issues, although only 85 per cent of businesses viewed health and safety *per se* as an important strategic activity.

Accordingly to Table A6, Annex A, and somewhat surprisingly, only 35 per cent of businesses agreed that shareholder value was a prime focus. Yet 55 per cent of businesses had shareholders who actively participated in strategy formulation. Further, 79 per cent of businesses had a diverse product/service portfolio. In total, 58 per cent of businesses collected detailed market intelligence; 71 per cent collected detailed customer intelligence.

Nearly all businesses stated that they prioritised customer needs, and 89 per cent focused on product/service quality. Yet only 69 per cent of businesses were well regarded by the investment community, although 83 per cent had access to all the investment funding they required. In total, 91 per cent of businesses operated in highly competitive markets.

Although stakeholder values have found their way into mainstream debate, as well as into the corporate literature of most public limited companies, only 27 per cent of businesses prioritise meeting the needs of external stakeholders (e.g., the community, suppliers, etc.). That said, 75 per cent of businesses indicated that they engaged with the local community, and 89 per cent suggested that they took their social responsibilities very seriously.

In terms of technology and innovation, 91 per cent of businesses kept up with new technologies and innovations, in the sense that they met or exceeded the relevant industry benchmark. Yet only 50 per cent of businesses could be characterised as innovation-led, in the sense that they ensured that their organisation led the way in terms of innovations in the way products or services were offered or delivered. Some 62 per cent of businesses had a mechanism by which employees could pass on innovative suggestions and 76 per cent rewarded their employees' creativity. A higher proportion, 80 per cent, gave their employees the space and autonomy to innovate and an identical proportion sought to build intra-industry networks to support innovation.

The Strategic Management Index (SMI)

In developing our Strategic Management Index (SMI) we draw heavily on previous contributions in the industrial relations and human resource management fields. In line with Ichniowski *et al* (1997) who develop a single HRM 'innovativeness' index from 13 human resource management variables, and Macduffie (1995), who stresses the need to select for measurement only those practices that could potentially be implemented in any plant, we draw on data from our survey questionnaire sent to a representative sample of UK businesses. Importantly, the survey was specifically designed to elicit information on the issues raised by our extensive qualitative interviews and focus group sessions with a range of business leaders, policy makers and academics. This should ensure that we address the latter issue adequately. On the former, we follow the basic methodology adopted by Ichniowski *et al* (1997) in creating a single index from the strategy variables identified in our 2003 Work and Enterprise

Survey. However, due to the broader scope of the current survey we are also able to create alternative indices using additional variables that were unavailable to us last year.

In line with Macduffie (1995) and Blatt (1999) we use an additive approach to combining practices. To quote Macduffie (1995), 'firms generally organise human resource practices into systems that are consistent with their culture and business strategy. It is the combination of practices in a bundle, rather than individual practices, that shapes the pattern of interactions between and among managers and employees'. Macduffie adds that, 'implicit in the notion of a 'bundle' is the idea that practices within bundles are interrelated and internally consistent, and that 'more is better' with respect to the impact on performance, because of the overlapping and mutually reinforcing effect of multiple practices'. This is consistent with Ichniowski *et al* (1997) who 'find consistent support for the conclusion that groups or clusters of complementary HRM practices have large effects on productivity, while changes in individual work practices have little or no effect on productivity'.

From our thirteen variables that finally constitute our strategy index, and following the logic of Ichniowski *et al* (1997), who associate high correlations between variables with complementarity, we observe from the correlation matrix that of 91 correlations 88 are positive and of those 79 are positive and significant.

This theory of complementarity can be linked to the line of work pursued by Milgrom and Roberts over a series of papers (see for example, Milgrom and Roberts, 1995; Meyer, Milgrom and Roberts, 1992). In the former paper the authors concern themselves with how the various components of the firms' organisation 'fit' with one another. Here, we are looking at strategic fit across five key areas in the sense of complementarities. In Milgrom and Roberts' words, 'the notion of complementarity is that activities are complements if doing (more of) any one of them increases the returns to doing (more of) others'. Innovation and workforce training might, therefore, be compliments in raising human capital.

There are two further aspects of the model of Milgrom and Roberts (1995) that are relevant here. Firstly, complementarity in their model is symmetric. It follows that increasing one of the variables increases the return to increasing the other. Secondly, the gains from increasing every component are more than the sum of the gains from individual increases. Empirically, this model has found support, particularly in the human resource management field, in a productivity context. Macduffie and Krafcik (1992), for example, find complementarities between human resource management and organisation, productivity, product quality. Similar results are reported by Ichniowski *et al* (1993). Meyer (1993) provides a good intuitive example of how increasing the focus on one strategic component raises the returns to increasing the focus on other strategies. They begin by assuming that profit is a function of three variables. Formally:

$$\tilde{O} = P(\mathbf{q}, \mathbf{r}, \mathbf{i}) \quad (7.2)$$

Where q = quantity, r = product innovation and i = frequency of process innovation. It follows that marginal revenue is increasing in both r and i . In other words, both product and process improvements increase profits. From this it is easy to see that increasing product innovation also increases the attractiveness of process innovation.

From the company-specific variables outlined in Table A6, Annex A, we now turn our attention to the creation of an index that combines strategic orientation across all six strategy areas defined by businesses as key elements that contribute to operational high performance. Thirteen of the variables are defined in terms of a Likert scale, coded 1 to 5. The first issue is to test for reliability of the thirteen items specified which form our index. As before, we calculate Cronbach's alpha to test for reliability. This assesses the reliability of a summative rating scale of the thirteen variables specified. Our scale is simply the sum of the individual item scores. The reliability alpha is simply the square of the correlation between the measured scale and the underlying factor.

The scale derived from our index appears to work well, with the estimated correlation between it and the underlying factor item measures being 0.87 and the estimated correlation between this battery of thirteen items and all other thirteen item batteries from the same domain being 0.76.¹⁴ Thus our index, developed from extensive interviewing of high-level managers and strategic decision-makers in a large number of companies, appears to be appropriate for inclusion in our subsequent productivity analysis.

Interestingly, this alpha coefficient is in line with Macduffie (1995) who reports alphas of 0.63 for their Buffer Index, 0.70 for their HRM Policy Index and 0.81 for their Work Systems Index and Blatt (1999) who reports an alpha of 0.77 for the Work Organization–Technology Index.

A further index was created in which the thirteen component variables were combined in a multiplicative way.¹⁵ Empirically, this was found to perform poorly compared to our additive scale.¹⁶

Empirical specification

The first step involves estimating a standard production function in which productivity (measured initially as output per worker, but subsequently as value added, value added per worker and output per worker) is simply a function of capital (machines, plant, buildings, etc.), labour and intermediate inputs such as energy and materials. The standard production function can, therefore, be written:

¹⁴ Test denotes the additive scale, here 0.20, which is the average inter-item correlation and 0.76 is the alpha coefficient for a test scale based on all items. Sign shows the direction each item variable entered the scale. In terms of the alpha, Nunnally and Bernstein (1994) suggest that reliability around 0.70 is sufficient

¹⁵ We thank Rachel Griffith of the Institute for Fiscal Studies for this suggestion.

¹⁶ From our baseline, additive index, the lowest score (out of a possible 100) is 24.13 and the highest is 82.55. Thus there is substantial variation across firms. This tends to weaken potential problems associated with systematic over-reporting firm quality/performance in survey-based responses. The mean score is 66.76 (std dev = 9.27) and the median score 67.31.

$$Y_i = T(K_i, L_i, M_i) \quad (7.3)$$

Y_i is the output of firm i . T is total factor productivity and is assumed to be a function of the stock of knowledge accumulated within the firm (human capital) and other factors that may affect productivity (strategic decision-making, governance, market orientation) and exogenous factors. T is, in turn, defined as follows:

$$T_i = Z(S_i, E_i) \quad (7.4)$$

Where S_i represents the strategic position of firm i ; E_i represents other external factors that impact on productivity of firm i .

This first estimation leaves us with what is technically termed the productivity residual. This is the part of total productivity that cannot be explained by differences in capital and labour across firms.

The second step involves testing whether differences in the characteristics of the markets in which firms operate, and the strategies adopted by different firms, play any role in determining why some firms are more productive than others (Black and Lynch, 2001).

We are not fortunate enough to have been able to build a panel of data over time, thus the two-step procedure outlined above is not appropriate for our cross-sectional survey data. We can, however, estimate a single equation, which approximates this two-stage process, in which productivity is modelled as a function of capital, labour, materials and our firm-specific variables outlined in Table A6, Annex A. The latter equate to the S_i in equation (4). We also use other, exogenous, survey variables to proxy for exogenous factors, the E_i , in equation (4).

First, we present the estimates from a basic Cobb-Douglas production function without our firm-specific and exogenous variables. These results will serve as a good benchmark for our subsequent, fuller estimation(s). The parameter estimates are presented below. T-statistics appear in parentheses.

$$\begin{aligned} (\ln) \text{ Output} &= 3.85 + 0.22 \ln K + 0.47 \ln L + 0.24 \ln M + 0.36 \ln W & (7.5) \\ & (28.46) \quad (20.76) \quad (41.10) \quad (25.11) \quad (23.90) \end{aligned}$$

Number obs. = 2053, Adj R sq = 0.73

$$\begin{aligned} (\ln) \text{ Value Added} &= 4.55 + 0.33 \ln K + 0.56 \ln L + 0.41 \ln W & (7.6) \\ & (27.32) \quad (25.37) \quad (44.76) \quad (22.55) \end{aligned}$$

Number obs. = 2017, Adj R sq = 0.76

Here, $\ln K$ is log capital, $\ln L$ is log labour, $\ln M$ is log materials and $\ln W$ the log wage rate (proxying labour quality).

From our gross output and value added models, we observe that decreasing returns-to-scale exist.¹⁷ That is, growth in employment, in capital stock, and in intermediate inputs would increase productivity by less than the proportionate increase in inputs. We also observe some variation in the size of the factor input coefficients across models. In general, the coefficients in the value added model are larger than those in the gross output model. This is in line with other studies (Nickell, 1996; Nickell *et al*, 1992; Gregg *et al*, 1993).

From (5) and (6) we can generate two equations that allow for distributional shares and can be written as:

$$\text{Gross Output} = 47 + 0.22 K^{0.24} + 0.47 L^{0.51} + 0.24 M^{0.26} \quad (7.7)$$

$$\text{Value Added} = 95 + 0.33 K^{0.37} + 0.56 L^{0.63} \quad (7.8)$$

From equations (7) and (8), we observe that in both equations the distributional share of capital is around half that of labour, which is consistent with the original work of Cobb and Douglas (1966) and the majority of empirical work that has followed. From (7) and (8) we also note that labour quality is positively and significantly related to productivity in both models.

Annex C, reports the results from the second part of our analysis that explores the potential effect of strategic variables on productivity. Model (1), Annex C, shows the estimates from our basic three-factor production function, augmented by the individual index items (thirteen in total), other non-index strategic variables and the usual controls (business age, sector, region, etc.). We observe that the basic factor input coefficients change slightly. Specifically, the coefficient on labour, L , increases from 0.47 to 0.55 while and the coefficient on capital, K , declines from 0.22 to 0.12. This is consistent with business-specific choice variables (i.e., strategy) having an important impact on capital productivity.

Concerning our basic control variables, we note that the retail/hotels/catering sector is the most productive. We also note that regional effects do not appear to be important, nor does business age, risk-taking propensity, or share of part-time employment in total employment. By contrast, labour quality is highly significant, and positive. Businesses where performance-related pay (PRP) schemes are commonplace tend to be more productive. We also observe that exporting businesses are more productive. The former two findings suggest that, on the labour side of the equation, having a high quality workforce, and

¹⁷ (Test: sum of labour, capital and materials coefficients = 1, $F=152.67$, sig 0.00, and test for labour and capital coefficients = 1, $F=122.62$, sig =0.00).

incentivising them appropriately, is critical to having a highly productive workforce. The latter suggests that exposure to international competition and markets forces businesses to become more productive.

Finally, and very importantly, none of our strategic index items is individually significant in model (1). This is initial evidence in support of the 'bundling' hypothesis, in the sense that strategies made in isolation do not seem to have an impact on productivity. We develop and test this further subsequently.

Model (2), Annex C, includes the same components as Model (1), but also includes our six strategic sub-indices covering complementary strategic decision-making in the areas of People, Shareholders, Stakeholders, Health and Safety, Innovation and Customer and Markets. We note that the three coefficients on the core factor inputs (capital, labour and materials) remain essentially unchanged in model (2). We also observe that retail/hotels/catering sector is, once again, the most productive sector.

Model (2) also points to regional differences, with the North East, East and South East (excluding London) being less productive than other regions, holding all else constant.

In this model we also see that one of the strategic index items - having an effective employee suggestion scheme - has significant, albeit negative impact on productivity. The other strategic index items do not appear to play a role.

However, the results do show that our innovation sub-index has a positive and significant impact on productivity. The other five sub-indices are insignificant. Thus, our evidence base is becoming more substantive regarding the relative merits of the strategic bundling of complementary strategies as opposed to implementing individual, potentially un-aligned strategies. Yet even within core strategic decision-making areas (our six sub-indices) we find that on balance they have little impact on overall productivity, with the notable exception of our Innovation Index.

At this stage we might tentatively conclude that making sure a business has a clear and complementary bundle of strategies surrounding innovation, particularly when this is combined with a high quality workforce, is the key determinant of higher productivity.

Model (3), Annex C, removes the thirteen strategic index items from Model (2), but leaves the six strategic sub-indices in the equation. The basic results remain the same. As in Model (2), we find a significant impact from our innovation sub-index and our measure of labour quality.

Model (4), Annex C, includes the (thirteen-item) strategic index but drops the six sub-indices. Core results also remain essentially unchanged. We also observe that widespread coverage by performance-related pay schemes is associated with higher productivity, as is exporting and labour quality. The key finding in model (4) is that our strategy index was found to act in a positive and significant way on productivity. This is strong confirmation of our hypothesis that the bundling of complementary strategies has a greater impact on performance than individual, uncoordinated, strategic decision-making.

Model (5), Annex C, builds on Model (4) by using variable addition tests to generate an inclusive model that allows individual items, strategic sub-indices and the composite strategy index to play a role in the determination of output. Reassuringly, the coefficients on our basic factor inputs remain the same, as do the previously identified sectoral and regional variables. We note that no individual items are significant, nor are any of our strategic sub-indices. However, our key variable, the composite strategy index is positive and significant, as is our measure of labour quality.

Having tested various models using a KLEM productivity equation, we now conduct a series of further tests to establish whether our key findings hold across equations using different productivity measures. This is important given the common finding that coefficients vary depending on the output measure adopted. If our Strategic Management Index is robust we would expect it to remain significant across different equations, although the actual magnitude of the coefficient might vary.

The first alternative specification we use measures output in value added terms. The basic difference here is that this type of model excludes materials, as we are capturing the added value in the productive process over and above the value prior to entering the business. Model (6), Annex C, confirms our initial findings: that there are diminishing returns to scale. Model (6) also points to some sectoral variation, with personal household and retail/hotels/catering being more productive, holding all else constant. The three regional effects remain the same. In addition, we note that the higher the proportion of workers covered by a performance-related pay system, the more value added. The same was true for exporting businesses and for businesses with higher quality labour. Our key variable, the composite strategy index remains significant, and of marginally greater magnitude than was the case in our KLEM models.

In model (7), Annex C, output per worker is the productivity measure on the left-hand side of the equation. Thus, key factor input variables on the right-hand side of the equation are divided by the labour input (i.e., capital per worker, materials per worker). Notwithstanding, all key results hold. Businesses with more capital per worker are more productive as predicted by economic theory, as are businesses with higher quality labour. Crucially, our composite strategy index is, once again, positive and significant. The basic result that there are diminishing returns to scale also holds.

Finally, Model (8), Annex C, uses value added per worker as our productivity measure. Thus we include capital per worker on the right hand side of the equation. In this instance we find that higher quality labour still has a positive and significant impact on labour productivity, as does capital per worker. Further, we find that our composite strategy index is significant at the 1 per cent level.

In Model (8), the lack of significance of individual strategic items strongly confirms the results of other empirical work that it is the bundling of

complementary strategies that matter if greater productivity is our end goal. Individual strategies, or un-coordinated strategic decision-making, have very little impact on productivity.

Overall, models (6), (7) and (8) confirm that our earlier findings are robust with respect to the choice of productivity measure.

Having tested various models, we pose one final question. Is higher productivity necessarily associated with higher profit margins? Although the nature of our survey dictates that we cannot test for dynamic effects, earlier empirical work suggests that there is a degree of long run and short run profit persistence (see Geroski and Jaqueman, 1988, for long-run evidence and Cowling, 2004, for short-run evidence). This suggests that businesses that have good profit performance today, are also more likely to have superior profit performance in the future, as previous research suggests that quality is a permanent and enduring feature in certain businesses.

The variable of interest here is calculated as the firm's profit deviation from the industry average. The exogenous variables we use in the profit equation are age of business (an age squared term is included to test for non-linearities in the relationship between profit and the age variable), sales growth over the previous three years, whether or not the business exports and the country of origin of the business. The value added equation is estimated as before.¹⁸

The system of equations is well specified and shows that businesses generating more value added per worker also have higher profit margins. Thus there is an important correlation between a key economic variable, productivity, and a key measure of business performance, profit. We also observe that the older a business is, the higher the rate of profit. The statistical significance of the age-squared term suggests that profit margins are increasing in age at an accelerating rate. However, we find no evidence to support the notion that historical growth over the previous three years increases the profit margin. One final and rather interesting finding is that US owned businesses do not generate higher profit margins than UK, European and other non-US owned businesses.

¹⁸ Our approach is to estimate a simultaneous equation system by 2 stage least squares (2SLS). This helps overcome any possible endogeneity problems caused by using productivity in a profit equation. The equation system takes the form:

$$\pi_i = f(\text{VAPL}_i + \text{exogenous variables})$$

$$\ln \text{VAPL} = g(\pi + \text{exogenous variables})$$

where f and g are linear functions.

8. Summary and conclusions

This study builds on The Work Foundation's 2003 Work and Enterprise Survey. The underlying hypothesis, however, remains the same: that the achievement of high levels of productivity and performance is, in part at least, a product of top management strategy. Specifically, management's role in, first, identifying key areas of business activity and corporate objectives and then developing complementary and consistent strategic objectives across these key areas of business activity.

The study aimed, first, to map the current state of strategic management across UK businesses in terms of the setting of core corporate objectives and relate this to business performance using both 'hard' and 'soft' measures. Second, based on the evidence, the study aimed to establish whether there were particular sets of strategic issues that were associated with high performance. Based on the findings from a telephone survey of top managers from nearly 3,000 UK businesses and case studies of 30 UK businesses of different sizes and sectors, the main conclusions are as follows:

People are the primary determinant of business performance. If a firm's people strategy is aligned with a consistent and complementary innovation strategy then there is a high probability of superior business performance.

The level of skills is important. Three sectors, health, utilities and education, are characterised by a highly skilled workforce. Retail/hotels/catering, personal household and transport are characterised by a low skilled workforce. In retail/hotels/catering and construction the proportion of under-skilled businesses (compared to the industry benchmark) is very low, at less than five per cent of businesses, whereas in manufacturing, mining and agriculture it is comparatively high, at one in six businesses. Businesses that provide external training tend to perform above the industry benchmark.

The capacity to innovate and bring new products and services to the market is also important. Manufacturing, other community, health, mining and utilities are all highly innovative sectors. Construction, transport and retail/hotels/catering, by contrast, are markedly less innovative, in the sense that there is little capacity to innovate and bring new products and services to the market.

Overall, around 16 per cent of businesses are below their industry sector innovation benchmark. The manufacturing, retail/hotels/catering, real estate, personal household, mining, other community and transport sectors have a comparatively high proportion of businesses falling below the industry sector innovation benchmark. Manufacturing and mining are the two industry sectors with the most businesses performing below the skills and innovation benchmarks.

Recruitment is important. The recruitment of skilled personnel is particularly problematic in construction, health and mining. The agriculture, retail/hotels/catering, transport and utilities sectors are doubly constrained in having skills problems within their existing workforces and recruitment problems going forward. Aligned with this, we also note that the median training and skills development expenditure per employee is £167 per annum. The mean is £874. This median figure appears very low suggesting that some businesses will continue to be constrained by lack of workforce skills.

Active employee absenteeism management is important. The average employee had 4.15 days off in the last year. This equates to 2,486 people days per annum for the average business, representing a total cost of £153,247 per annum, or the loss of nearly seven employees for a whole year. This absenteeism problem is most acute in health, other community and manufacturing industry sectors. Health and Safety strategies contribute to reducing absenteeism.

Attracting quality employees with the relevant skills and knowledge and engendering employee commitment are also important. Smaller businesses have serious problems recruiting quality employees. This is not due to poor basic pay or inadequate flexible working arrangements. However, more individualised pay, such as performance-related pay and the linking pay to effort and productivity has a strong influence on a potential employee's decision to join a business.

Having an integrated, and complementary system of HRM and people management strategies was found to have a large and positive impact on the recruitment of skilled employees. Larger businesses appear to have the greatest problems with employee engagement and engendering employee commitment, which leads to higher absentee rates. Commitment is engendered when lines of communication between management and employees are clear and well functioning.

Having a clear and aligned people strategy has a positive and significant impact on businesses' ability to operate at, or above, their industry innovation benchmark, attract quality employees and engenders high levels of employee commitment. It is associated with higher sales growth, enabling businesses to operate at, or above, the industry skills benchmark and is associated with higher sales of new technology-based products.

Strategic management is important. Businesses that focus on a range of 'bundles' of core strategic issues have a greater impact on productivity than those that focus on a single core issue in isolation. Firms scoring high on the Strategic Management Index (SMI) were those with the highest levels of productivity.

The retail/hotels/catering sector is particularly efficient and there is a productivity advantage associated with exporting and being exposed to international competition across the board. We also observe that high wage-high skills businesses are more productive, suggesting that the high value added route is more successful than the low pay-low skill route.

More generally, our production function estimates suggest that businesses face decreasing returns-to-scale i.e., as businesses get larger their average costs per unit of output rise. This implies that large businesses

need to allow their senior managers more autonomy in terms of their governance and decision-making processes if they are to replicate the success of small businesses.

There are five broad areas that illustrate what high performing businesses are doing and what low performing businesses are not:

- Encourage people by rewarding employees for their service to customers, innovative ideas, good citizenship as well as overall performance. Human resources must be seen as a key strategic driver of the business. Only then can businesses retain and attract quality employees.
- Facilitate and encourage people to be innovative and to network outside the confines of the businesses. This adds value to employees' work. When combined with a positive approach to risk-taking, this can encourage and engage the networked, flexible employee.
- Engage stakeholders and understand their 'reason to be'. Clearly communicate that shared values and a shared sense of purpose, particularly along the supply chain, enables all stakeholders to point in the same direction.
- In terms of shareholders and governance, investment analysts can be a strategy soundboard and understand the value in a business beyond short-run returns. Thus, the nature of the investor relationship can change and be beneficial to the business if defined and engaged appropriately.
- Focus on the external face of the business by looking towards customers and markets. High performing businesses have employees who know who their customers are and understand their role in fulfilling customer needs. Feedback loops in these businesses tend to be well established and feed into performance improvement and innovation.
- Low performing businesses have employees who have little concept of, or interest in, where their work fits into the business as a whole and whose relationship with stakeholders are transactional and with whom they are not fully engaged. Employees are not rewarded or recognised for their individual performance, HR is given little credence and staff development is non-existent.

What can Government do? There are four key areas in which Government can help create the conditions for high performance to flourish:

- Encourage businesses to invest in people through skills training, staff development and tackling workplace literacy.
- Encourage businesses to invest more in innovation, R&D and knowledge.
- Encourage management to build high trust relationships, first, between businesses and, second, between employers and employees.

- Encourage management to try and get a better understanding of the management practice that encourages the development and sustainability of high performing business.

These are all areas in which there have been considerable policy advances in recent years.

There is, for example, already a significant programme of work to address the current and future skills needs of the economy. Through the skills strategy, the Government continues to recognise the importance of investing in people and matching skills with employer needs. Support has tended to focus on basic skills and level 2. The increasing emphasis placed on level 3, through initiatives such as the National Employer Training Programme, is particularly welcome. This is part of an overall demand-led framework, which includes employer-led sector skills agreements and reform of the curriculum and qualifications to better meet employers' needs.

With the introduction of the Operating and Financial Review (OFR), pension fund trustees, the investment community and the boards of listed companies now have the opportunity to focus on what are the 'core' issues – over and above financial data – that should be measured and reported.

In conclusion, the achievement of the strategic alignment required for business, as suggested by our high performance model, requires a new model of management leadership. The current leadership model assumes employees do not have views about where top management want to take them. A more pluralistic model of leadership is required, where leaders value the opinions of employees and stakeholders and modify their approach accordingly. Government may have a role in encouraging policy makers and analysts to focus more on the role and impact of management. Research Councils are playing an important role in setting the research agenda, while the Department of Trade and Industry (DTI) is encouraging and facilitating businesses to benchmark themselves against the best-performing firms in their industry sector and to ensure that UK businesses have a repository for this new body of knowledge.¹⁹

¹⁹ See, for instance, the DTI publication *High Performance Work Practices - Linking Strategy and Skills to Performance Outcomes*, http://www.dti.gov.uk/training_development/HPW_Practices.pdf

Annex A: Supplementary tables

Table A1. Employment size distribution, by industry sector

	Employment size band				No. Obs.
	0-9	10-49	50-249	250+	
Agriculture	72	19	6	4	197
Construction	40	38	14	8	195
Personal household	63	20	11	6	500
Retail/Hotel/catering	47	32	12	9	187
Transport	39	28	21	12	169
Finance	24	33	19	24	194
Real estate	50	22	16	13	399
Education	33	44	20	2	208
Health	34	38	26	3	120
Other community	49	27	16	9	173
Mining	42	28	17	14	178
Manufacturing	30	23	21	26	304
Utilities	45	26	13	17	78
Total	46	27	16	11	2,902

Source: The Work Foundation Percentage shares are rounded to the nearest whole percentage.

Table A2. Headquarter distribution of businesses trading in the UK, by location

	UK	Europe	Rest of World
Agriculture	90	0	10
Construction	87	13	0
Personal household	79	13	8
Retail/hotel/catering	100	0	0
Transport	68	18	15
Finance	51	12	37
Real estate	72	9	19
Education	89	2	9
Health	100	0	0
Other community	94	6	0
Mining	56	18	26
Manufacturing	50	20	30
Utilities	52	19	29
Total	72	12	16

Source: The Work Foundation Percentage shares are rounded to the nearest whole percentage.

Table A3. Governance by size and class of business

	Micro		Small		Medium		Large	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Executive directors	2	2	2.5	2	4	3	10.5	4
Non-exec directors	0.5	0	1	0	1.5	1	2.5	1
Managers	2	2	6	4	15	10	88	10
Shareholders	753	2	360	1	2,610	2	10,451	1
FTEs*	2.5	2	24	22	120	102	4,597	613

Source: The Work Foundation, *FTE corresponds to Full Time Equivalent.

Table A4. Performance measure definitions

Performance measure	Item
<ul style="list-style-type: none"> • Business above industry innovation benchmark • Business attracts good quality employees from other companies in the industry • Strong market position, relative to competitors 	<ul style="list-style-type: none"> • Business innovation level – industry innovation level • Scale 1 ? 5 (ordered variable) • Scale 1 ? 5 (ordered variable)
<ul style="list-style-type: none"> • How many days a year does an average member of staff take off because of illness or injury • Majority of employees demonstrate a high level of commitment to the business • Do you sell your products or services in the UK only, overseas, or both • Total customers based outside the UK 	<ul style="list-style-type: none"> • Number of days (continuous variable) • Scale 1 ? 5 (ordered variable) • Three possible responses • Percentage (continuous variable)
<ul style="list-style-type: none"> • Total sales exported 	<ul style="list-style-type: none"> • Percentage (continuous variable)
<ul style="list-style-type: none"> • Total sales accounted for by a product/service that uses technology not available a year ago • Compared to three years ago, has your turnover increased, decreased, or stayed the same • Percentage change in turnover over the last three years • Gross profit, weighted by industry 	<ul style="list-style-type: none"> • Percentage (continuous variable) • Three responses possible (ordered variable) • Percentage (continuous variable) • Sales – costs (labour, capital, materials)
<ul style="list-style-type: none"> • Workforce above industry skills benchmark 	<ul style="list-style-type: none"> • Business workforce skills level – industry skills level

Source: The Work Foundation

Table A5. Performance outcomes summary table

Performance measure	Strategy index					
	People	Customers & markets	Innovation	Shareholder	Stakeholder	Health & safety
• Technology benchmark	+	+	+	0	+	0
• Attract quality employees	+	+	+	0	0	0
• Competitive market position	0	+	0	+	+	0
• Employee absence	0	0	0	-	0	0
• Employee commitment	+	0	+	0	+	0
• Overseas exporter	0	+	0	0	-	0
• Export intensity	0	0	+	0	-	0
• Three year sales growth	+	0	0	+	0	0
• Skills benchmark	+	0	-	0	-	+
• Percentage overseas customers	0	+	0	-	-	0
• New technology sales	+	0	-	0	0	-
• New technology sales intensity	0	+	+	0	0	0

Source: The Work Foundation

Table A6. Sample statistics

	Mean	Standard deviation	Minimum	Maximum	Median
Gross output (£m)	27.70	95.20	0.03	980	0.90
FTEs	598.63	6,359.38	1	9,950	6
Capital (£m)	10.60	59.50	0	3,360	0.02
Materials/output	0.23	0.21	0	1	0.02
Firm characteristics/ strategic foci	Mean Score 1 ? 5	Standard Deviation	Minimum	Maximum	Percentage strongly agree/agree
Shareholder value	2.23	1.31	1	4	0.35
Product/service diversity	3.78	1.39	1	5	0.79
Collect market intelligence	3.37	1.45	1	5	0.58
Collect customer	3.79	1.37	1	5	0.71
Prioritise customer needs	4.82	0.57	1	5	0.97
Product/service quality	3.87	0.41	1	4	0.89
Stakeholder focus	2.35	1.18	1	4	0.27
At innovation/technology benchmark	4.31	1.00	1	5	0.91
Innovation led	3.18	0.98	1	4	0.50
Skilled workforce	4.66	0.73	1	5	0.96
Attracts good quality employees	3.64	1.36	1	5	0.76
Invests in workforce training	3.97	1.32	1	5	0.75
Recognises trade unions	2.68	1.60	1	5	0.40
Performance pay (percentage of workers)	0.27	0.39	0	1	n.a.
Well-regarded by investment community	3.87	1.25	1	5	0.69
Shareholders active in strategy formulation	3.29	1.46	1	5	0.55
Proactive employee relations strategy	4.63	0.80	1	5	0.92
Engage local community	3.94	1.30	1	5	0.75
Socially responsible	4.47	0.91	1	5	0.89
Employee suggestion scheme	3.55	1.44	1	5	0.62
Employees rewarded for creativity	4.02	1.17	1	5	0.76
Employees have autonomy to innovate	4.06	1.14	1	5	0.80
Health and safety is a strategic activity	4.35	1.04	1	5	0.85
Employee power to act on health and safety	4.66	0.78	1	5	0.93
Business networks within industry	3.79	1.40	1	5	0.80
Highly competitive	4.59	0.89	1	5	0.91
Access to required investment funds	3.93	1.37	1	5	0.83

Source: The Work Foundation

Annex B: Business performance

Table B1. Business performance

Variable	(1)		(2a)		(2b)		(3)		(4)		(5)	
	Technology benchmark		New technology sales		New technology sales intensity		Business attracts good quality employees		Market position strong compared to competitors		Average days off per employee	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	t stat
Region:												
West Midlands	-	-	-	-	-	-	-	-	-	-	-	-
East Midlands	0.06	0.34	0.06	0.29	-0.01	0.08	-0.13	0.85	-0.11	0.95		
East	0.09	0.53	-0.06	0.27	-0.35	2.08	-0.01	0.06	-0.09	0.83		
London	0.30	1.86	0.19	1.02	0.12	0.76	0.01	0.04	-0.12	1.23		
North East	-0.48	2.01	0.02	0.08	-0.31	1.34	-0.08	0.38	-0.50	3.40		
North West	-0.08	0.51	0.12	0.63	0.06	0.39	0.02	0.14	-0.14	1.32		
South East	0.26	1.71	-0.19	1.00	0.00	0.03	0.19	1.40	-0.10	1.06		
South West	0.04	0.22	-0.35	1.68	-0.02	0.12	-0.07	0.48	-0.13	1.23		
Yorks & Humber	-0.01	0.04	0.13	0.64	0.04	0.26	-0.04	0.25	-0.08	0.78		
Wales	0.19	0.99	-0.19	0.74	0.10	0.54	0.15	0.89	-0.01	0.04		
Scotland	-0.04	0.19	0.50	2.04	-0.05	0.26	0.30	1.54	-0.23	1.77		
N. Ireland	0.39	1.56	-0.31	0.80	-0.09	0.36	0.10	0.38	-0.10	0.59		

	(1) Technology benchmark Cont.		(2a) New technology sales Cont.		(2b) New technology sales intensity Cont.		(3) Business attracts good quality employees Cont.		(4) Market position strong compared to competitors Cont.		(5) Average days off per employee Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	t stat
Sector:												
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Construction	0.02	0.10	0.45	1.91	-0.79	1.92	0.15	0.83	0.20	1.33	-0.13	1.02
Personal household	-0.27	1.66	0.49	2.29	-0.88	2.25	0.08	0.47	0.21	1.59	-0.03	0.25
Retail, hotels, catering	-0.46	2.15	0.18	0.63	-0.50	1.03	-0.19	0.87	0.27	1.45	-0.21	1.32
Transport	0.02	0.12	-0.17	0.63	-0.25	0.57	0.46	2.33	0.07	0.44	-0.12	0.92
Finance	-0.07	0.34	0.31	1.19	-0.60	1.37	0.06	0.27	-0.27	1.66	-0.22	1.59
Real estate	0.01	0.04	0.12	0.51	-0.60	1.50	0.26	1.48	0.23	1.66	-0.08	0.66
Education	-0.03	0.13	0.29	1.12	-1.07	2.41	0.26	1.18	0.31	1.83	-0.24	1.63
Health	0.07	0.25	-0.03	0.09	-0.29	0.54	0.14	0.52	0.29	1.42	-0.16	0.92
Other community	0.17	0.84	0.31	1.16	-0.45	1.04	0.22	1.05	0.37	2.11	-0.03	0.24
Mining	-0.14	0.73	0.19	0.77	-0.45	1.11	0.11	0.58	-0.19	1.20	-0.05	0.37
Manufacturing	-0.08	0.48	0.10	0.45	-0.63	1.57	-0.06	0.35	0.14	0.99	-0.14	1.12
Utilities	0.26	1.02	0.73	2.33	-0.59	1.21	-0.18	0.72	0.11	0.48	-0.12	0.71
Single establishment	-0.24	2.78	0.06	0.55	-0.20	1.33	0.15	1.70	0.02	0.25	-0.11	2.05
Employment Size:												
0 – 9	-	-	-	-	-	-	-	-	-	-	-	-
10 – 49	-0.16	1.57	-0.28	2.18	0.10	0.52	0.26	2.56	0.04	0.48	0.14	2.28
50 – 249	0.02	0.14	-0.19	1.21	0.49	2.22	0.46	3.62	0.08	0.67	0.32	4.23

	(1) Technology benchmark Cont.		(2a) New technology sales Cont.		(2b) New technology sales intensity Cont.		(3) Business attracts good quality employees Cont.		(4) Market position strong compared to competitors Cont.		(5) Average days off per employee Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	t stat
250 +	0.00	0.00	-0.14	0.71	0.44	1.58	0.66	4.23	0.23	1.61	0.51	5.41
Part-time employment Share	0.04	0.30	0.12	0.73	0.12	0.50	-0.12	0.95	0.15	1.41	0.29	3.28
Limited liability	0.10	0.86	0.27	1.80	-0.34	1.67	0.07	0.58	-0.09	0.86	0.01	0.14
Performance-related pay coverage	-0.01	0.06	-0.17	1.46	-0.21	1.26	0.39	4.25	0.02	0.30	-0.03	0.46
Ln Wage	0.01	0.41	-0.01	0.17	0.04	0.95	-0.01	0.45	-0.05	1.93	-0.01	0.70
Technology Use:												
Tried and tested	-	-	-	-	-	-	-	-	-	-	-	-
Develops own	0.40	4.38	0.53	4.81	0.22	1.25	0.03	0.33	0.31	3.75	-0.05	0.90
Buys in early stage	0.55	5.40	0.51	4.27	0.39	2.12	0.23	2.29	0.15	1.70	0.02	0.26
Attitude to Risk:												
Averse	-	-	-	-	-	-	-	-	-	-	-	-
Neutral	0.03	0.34	-0.13	0.00	-0.26	1.65	-0.02	0.19	0.08	1.19	0.04	0.65
Loving	0.02	0.23	-0.00	0.77	-0.23	1.15	0.08	0.76	0.04	0.42	-0.04	0.58
R&D active	0.06	0.75	0.29	2.86	-0.04	0.21	0.17	2.19	-0.06	0.90	0.01	0.14
Training active	0.25	2.19	0.22	1.52	-0.50	2.18	-0.08	1.30	-0.14	1.48	-0.05	0.64
Ln Age	-0.01	0.24	0.06	1.32	-0.25	3.48	-0.05	1.30	-0.00	0.00	-0.01	0.28
Age squared	0.00	0.27	0.00	1.56	-0.00	0.79	0.00	1.07	-0.00	1.31	0.00	1.22

	(1)		(2a)		(2b)		(3)		(4)		(5)	
	Technology benchmark Cont.		New technology sales Cont.		New technology sales intensity Cont.		Business attracts good quality employees Cont.		Market position strong compared to competitors Cont.		Average days off per employee Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	t stat
VAT registered	0.08	0.70	0.00	0.01	-0.23	1.08	-0.05	0.42	-0.10	1.03	-0.17	2.08
Strategy Indices:												
Shareholder	0.05	0.89	0.01	0.08	-0.06	0.59	0.04	0.67	0.16	3.52	-0.08	2.27
Stakeholder	0.18	2.66	-0.01	0.09	0.17	1.40	-0.04	0.65	0.15	2.78	0.01	0.15
Health & safety	-0.07	1.25	-0.15	2.05	-0.02	0.22	0.01	0.13	0.08	1.60	0.01	0.29
Innovation	0.35	3.22	-0.25	1.78	0.47	2.12	0.20	3.70	0.07	1.54	0.01	0.20
Customers & markets	0.09	2.04	0.02	0.29	0.20	2.33	0.11	2.58	0.10	2.55	0.04	1.45
People	0.29	3.27	0.22	1.95	-0.11	0.59	0.72	4.83	0.09	1.27	-0.07	0.98
Constant			-2.93	4.88	6.07	5.18					1.60	2.61
N Obs	1090		1372		264		1086		1585		893	
Prob > χ^2	0.00001		0.00001				0.00001		0.00001		0.00001	
Adj Rsq											0.06	
Pseudo Rsq	0.31						0.10		0.06			

Table B1. Business performance (Cont.)

Variable	(6)		(7a)		(7b)		(8)		(9)	
	Employee commitment		Exporter		Export intensity		Skills benchmark		Three year sales change %	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat
Region:										
West Midlands	-	-	-	-	-	-	-	-	-	-
East Midlands	0.22	1.18	0.05	0.25			0.08	0.48	0.02	0.01
East	0.17	0.98	0.20	0.97			0.03	0.16	0.08	0.06
London	0.14	0.91	0.64	3.53			-0.17	1.11	-0.50	0.42
North East	0.37	1.57	0.13	0.48			0.11	0.49	3.03	1.73
North West	-0.08	0.51	0.23	1.18			0.00	0.02	0.96	0.76
South East	0.26	1.70	0.27	1.50			0.03	0.24	-0.16	0.14
South West	0.09	0.54	0.34	1.79			-0.05	0.30	1.76	1.39
Yorks & Humber	0.06	0.35	0.25	1.22			0.03	0.20	0.99	0.74
Wales	0.19	0.98	0.16	0.70			0.17	0.09	0.40	0.27
Scotland	0.36	1.48	0.39	1.54			-0.04	0.22	0.78	0.46
N.Ireland	0.08	0.27	0.86	2.69			-0.09	0.36	1.25	0.56
Sector:										
Agriculture	-	-	-	-	-	-	-	-	-	-
Construction	-0.08	0.44	-0.20	0.89	3.77	0.35	-0.01	0.06	0.67	0.49
Personal household	0.13	0.85	0.47	2.52	1.70	0.22	0.47	2.93	-2.01	1.70

	(6)		(7a)		(7b)		(8)		(9)	
	Employee Cont.	commitment	Exporter Cont.		Export intensity Cont.		Skills benchmark Cont.		Three year sales change % Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat
Retail, hotels, catering	-0.11	0.55	0.46	1.81	-5.09	0.48	0.58	2.71	-0.90	0.56
Transport	0.14	0.78	0.56	2.62	13.26	1.54	0.29	1.54	-0.90	0.63
Finance	0.10	0.52	0.09	0.40	5.51	0.59	0.06	0.31	-3.94	2.61
Real estate	0.31	1.87	0.38	1.96	-0.66	0.08	-0.10	0.55	-1.76	1.42
Education	0.30	1.48	0.32	1.37	26.69	2.79	-0.10	0.46	-3.16	2.11
Health	0.46	1.84	-0.65	1.59	-21.65	0.92	-0.37	1.40	0.82	0.46
Other community	0.51	2.42	-0.19	0.72	-3.51	0.31	-0.02	0.09	-1.73	1.16
Mining	0.17	0.91	1.00	4.73	13.84	1.63	-0.03	0.17	-1.43	1.00
Manufacturing	0.12	0.73	1.07	5.49	9.61	1.21	0.00	0.03	-2.40	1.88
Utilities	0.13	0.48	0.42	1.51	0.94	0.09	-0.43	1.71	-2.36	1.21
Single establishment	0.21	2.25	0.12	1.20	-0.68	0.18	0.01	0.10	-0.72	1.04
Employment Size:										
0 – 9	-	-	-	-	-	-	-	-	-	-
10 – 49	-0.41	3.94	0.12	1.07	0.21	0.05	0.05	0.54	0.12	0.15
50 – 249	-0.59	4.61	0.17	1.19	0.46	0.09	0.03	0.26	0.77	0.79
250 +	-0.57	3.67	0.20	1.13	6.05	1.01	0.05	0.36	0.81	0.68
Part-time employment share	-0.43	3.41	-0.31	2.08	-4.84	0.75	0.34	2.76	-0.01	0.01
Ltd liability	-0.04	0.29	0.31	2.24	2.78	0.63	-0.16	1.40	0.39	0.41

	(6)		(7a)		(7b)		(8)		(9)	
	Employee Cont.	commitment	Exporter Cont.		Export intensity Cont.		Skills benchmark Cont.		Three year sales change % Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat
Performance-related pay coverage	0.13	1.40	0.22	2.20	-8.17	2.28	0.06	0.65	0.86	1.26
Ln wage	0.02	0.71	0.04	1.09	-0.21	0.18	-0.04	1.42	-0.18	0.88
Technology Use:										
Tried and tested	-	-	-	-	-	-	-	-	-	-
Develops own	-0.08	0.86	0.48	4.74	14.44	3.61	0.02	0.21	1.72	2.44
Buys in early stage	-0.06	0.62	0.31	2.74	4.48	1.05	-0.01	0.13	1.15	1.48
Attitude to risk:										
Averse	-	-	-	-	-	-	-	-	-	-
Neutral	-	-	-	-	-	-	-	-	-	-
Loving	-	-	-	-	-	-	-	-	-	-
R&D active	-0.12	1.52	0.34	3.76	4.45	1.18	0.00	0.03	-1.37	2.28
Training active	-0.30	2.50	0.07	0.53	-0.14	0.03	-0.19	1.61	-0.22	0.26
Ln Age	0.04	1.07	0.11	2.67	1.52	1.03	-0.02	0.70	0.79	2.86
Age squared	-0.00	0.03	0.00	0.28	-0.02	0.36	0.00	0.23	-0.01	0.90
VAT registered	-0.03	0.28	0.31	2.25	-9.22	1.60	0.13	1.08	-0.76	0.90
Strategy Indices:										
Shareholder	0.02	0.42	0.10	1.57	-1.48	0.64	0.04	0.74	1.29	3.17
Stakeholder	0.14	2.30	-0.27	3.76	-6.42	2.29	-0.14	2.18	0.75	1.53

	(6)		(7a)		(7b)		(8)		(9)	
	Employee Cont.	commitment	Exporter Cont.		Export intensity Cont.		Skills benchmark Cont.		Three year sales change % Cont.	
	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat	Coeff	Z stat
Health & safety	0.04	0.64	-0.10	1.60	-0.84	0.36	0.12	2.06	-0.57	1.30
Innovation	0.25	4.72	0.03	0.52	3.46	1.69	-0.09	1.78	0.00	0.00
Customers & markets	-0.07	1.53	0.06	1.13	1.45	0.77	-0.04	0.93	-0.23	0.71
People	0.53	3.96	-0.03	0.32	0.65	0.19	0.31	2.18	2.06	3.13
Constant			-3.38	6.20	17.73				6.91	2.07
Selection term			-0.80	0.10						
N Obs	1596		1442		449		1098		1620	
Prob > χ^2	0.00001		0.00001				0.00001		0.00001	
Adj Rsq									0.03	
Pseudo Rsq	0.15						0.07			

Annex C: Production function estimates

Table C1. Production function estimates

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6*		Model 7**		Model 8***	
	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat
Capital	0.13	9.40	0.12	8.71	0.12	8.80	0.13	9.47	0.12	8.71	0.24	10.70	0.12	8.97	0.27	11.90
Labour	0.55	28.75	0.56	28.04	0.56	28.74	0.55	29.91	0.56	27.91	0.67	26.24	-0.06	4.83		
Materials	0.25	17.92	0.25	17.39	0.25	17.98	0.25	18.26	0.25	17.43			0.25	18.12		
Sector:																
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Construction	0.09	0.83	0.08	0.74	0.08	0.77	0.09	0.87	0.08	0.71	0.16	1.16	0.08	0.75	0.10	0.75
Personal household	0.15	1.56	0.17	1.52	0.15	1.49	0.16	1.62	0.15	1.49	0.23	1.81	0.15	1.50	0.19	1.49
Retail, hotels, catering	0.29	2.15	0.29	2.09	0.25	1.82	0.28	2.07	0.29	2.07	0.29	1.67	0.25	1.86	0.21	1.20
Transport	0.05	0.40	0.02	0.14	0.02	0.18	0.05	0.47	0.01	0.12	0.10	0.69	0.02	0.15	0.02	0.11
Finance	0.09	0.81	0.10	0.80	0.11	0.90	0.10	0.89	0.09	0.76	0.24	1.60	0.11	0.91	0.09	0.56
Real estate	0.13	1.29	0.11	1.06	0.13	1.20	0.14	1.37	0.11	1.04	0.13	0.98	0.13	1.22	0.06	0.44
Education	0.02	0.19	-0.06	0.42	-0.06	0.48	0.01	0.09	-0.06	0.46	-0.05	0.33	-0.06	0.45	-0.18	1.08
Health	0.22	1.52	0.20	1.34	0.20	1.32	0.22	1.53	0.20	1.31	0.28	1.44	0.20	0.32	0.14	0.74
Other community	0.08	0.68	0.07	0.54	0.07	0.59	0.09	0.75	0.06	0.49	0.08	0.54	0.07	0.62	-0.00	0.02
Mining	-0.09	0.80	-0.09	0.74	-0.10	0.84	-0.09	0.83	-0.09	0.73	-0.08	0.55	-0.09	0.82	-0.18	1.18

	Model 1 Cont.		Model 2 Cont.		Model 3 Cont.		Model 4 Cont.		Model 5 Cont.		Model 6* Cont.		Model 7** Cont.		Model 8*** Cont.	
	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat
Manufacturing	0.02	0.20	0.02	0.24	0.01	0.13	0.02	0.22	0.02	0.23	0.11	0.81	0.02	0.24	0.00	0.02
Utilities	0.04	0.27	0.06	0.40	0.07	0.45	0.05	0.34	0.06	0.40	0.08	0.42	0.06	0.43	-0.02	0.10
Region:																
West Midlands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East Midlands	-0.03	0.34	-0.10	0.94	-0.11	1.11	-0.04	0.44	-0.10	0.96	-0.13	1.00	-0.10	0.98	-0.14	1.06
East	-0.15	1.61	-0.20	2.06	-0.21	2.19	-0.16	1.67	-0.20	2.05	-0.26	2.10	-0.20	2.06	-0.30	2.35
London	-0.09	1.03	-0.12	1.29	-0.12	1.35	-0.09	1.02	-0.12	1.29	-0.14	1.25	-0.11	1.20	-0.18	1.52
North East	-0.17	1.35	-0.22	1.65	-0.25	1.94	-0.19	1.54	-0.22	1.68	-0.27	1.66	-0.23	1.79	-0.32	1.94
North West	-0.09	1.05	-0.13	1.39	-0.13	1.43	-0.10	1.11	-0.13	1.38	-0.17	1.48	-0.12	1.31	-0.21	1.85
South East	-0.12	1.47	-0.16	1.80	-0.17	1.95	-0.13	1.59	-0.16	1.80	-0.20	1.80	-0.16	1.81	-0.22	2.03
South West	-0.01	0.11	-0.06	0.63	-0.06	0.63	-0.01	0.09	-0.06	0.62	-0.05	0.41	-0.05	0.52	-0.04	0.35
Yorks & Humber	-0.02	0.17	-0.04	0.39	-0.05	0.49	-0.02	0.25	-0.04	0.41	-0.17	1.40	-0.04	0.44	-0.17	1.38
Wales	0.12	1.10	0.08	0.72	0.07	0.65	0.11	1.02	0.08	0.68	0.02	0.15	0.06	0.58	-0.02	0.12
Scotland	-0.11	1.04	-0.15	1.28	-0.16	1.42	-0.13	1.19	-0.15	1.31	-0.13	0.93	-0.15	1.36	-0.14	0.94
N. Ireland	-0.14	1.02	-0.16	1.07	-0.14	0.97	-0.12	0.86	-0.16	1.08	-0.14	0.75	-0.13	0.86	-0.17	0.87
Technology use:																
Tried and tested	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Develops own	-0.06	1.20	-0.06	1.25	-0.05	0.99	-0.05	1.12	-0.06	1.26	-0.06	1.04	-0.05	1.10	-0.07	1.14
Buys in early stage	-0.05	0.81	-0.06	1.02	-0.05	0.81	-0.04	0.72	-0.06	1.04	-0.09	1.27	-0.05	0.92	-0.10	1.27
VAT registered	-0.07	0.96	-0.03	0.37	-0.02	0.33	-0.06	0.86	-0.02	0.38	-0.02	0.25	-0.03	0.42	-0.06	0.60

	Model 1 Cont.		Model 2 Cont.		Model 3 Cont.		Model 4 Cont.		Model 5 Cont.		Model 6* Cont.		Model 7** Cont.		Model 8*** Cont.	
	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat
Origin:																
UK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Europe	-0.07	0.62	-0.10	0.83	-0.08	0.68	-0.08	0.65	-0.11	0.86	-0.19	1.24	-0.09	0.75	-0.19	1.22
US	-0.10	0.61	-0.14	0.80	-0.08	0.48	-0.07	0.44	-0.13	0.77	-0.14	0.61	-0.09	0.51	-0.10	0.42
Rest of World	0.03	0.20	0.04	0.23	0.03	0.17	0.03	0.20	0.04	0.24	-0.19	0.93	0.01	0.08	-0.21	1.01
Performance-related pay coverage	0.09	1.78	0.08	1.49	0.08	1.60	0.09	1.92	0.08	1.50	0.15	2.29	0.08	1.62	0.10	1.53
R&D active	-0.02	0.49	-0.04	0.96	-0.04	0.99	-0.02	0.62	-0.04	0.94	-0.09	1.55	-0.04	0.91	-0.13	2.33
Exporter	0.08	1.97	0.06	1.38	0.07	1.55	0.09	2.11	0.06	1.40	0.12	2.21	0.06	1.50	0.08	1.54
3 year sales change	-0.00	0.44	-0.00	0.13	-0.00	0.42	-0.00	0.52	-0.00	0.12	-0.00	0.09	-0.00	0.42	-0.00	0.50
Age	0.02	1.04	0.01	0.62	0.02	0.78	0.02	1.09	0.01	0.64	0.02	0.78	0.01	0.78	-0.02	0.79
Employee absence Days	0.02	0.62	0.00	0.02	0.00	0.03	0.01	0.48	0.00	0.00	-0.01	0.09	-0.00	0.02	-0.05	1.22
Training active	0.03	0.43	0.07	1.00	0.05	0.73	0.03	0.45	0.07	1.00	0.11	1.28	0.06	0.86	0.04	0.48
Part-time employment share	-0.04	0.47	-0.03	0.36	-0.03	0.39	-0.03	0.47	-0.03	0.36	-0.05	0.46	-0.03	0.42	0.10	1.00
Well regarded by financial community	-0.01	0.23	-0.00	0.05					-0.01	0.19						
Shareholders active in strategy formulation	0.04	0.92	0.06	1.23					0.05	0.94						
Positive approach to employee relations	0.03	0.28	0.09	0.70					0.08	0.68						
Engages community	-0.03	0.54	0.02	0.28					0.01	0.16						

	Model 1 Cont.		Model 2 Cont.		Model 3 Cont.		Model 4 Cont.		Model 5 Cont.		Model 6* Cont.		Model 7** Cont.		Model 8*** Cont.	
	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat
Socially responsible	0.07	0.95	0.10	1.22					-0.11	1.14						
Employee suggestion scheme	-0.03	0.70	-0.12	1.90					-0.02	1.84						
Employees rewarded for creativity	0.05	1.06	-0.03	0.39					-0.10	0.33						
Employees have autonomy to innovate	-0.00	0.02	-0.11	1.58					-0.06	1.49						
H&S strategic activity	0.01	0.19	-0.05	0.64					-0.01	0.77						
Employee H&S autonomy	0.05	0.56	0.01	0.09					-0.01	0.09						
Business networks within industry	-0.01	0.65	-0.01	0.39					-0.01	0.66						
Diverse product / service portfolio	0.05	1.11	0.05	1.14					0.03	0.61						
Attracts quality employees from industry pool	0.02	0.42	0.04	0.89					0.03	0.48						
Wage	0.47	25.18	0.48	24.87	0.48	25.51	0.48	25.72	0.48	24.73	0.53	18.96	0.48	25.15	0.55	19.43
Strategy Indices:																
Shareholder			-0.04	0.96	-0.02	0.53			-0.05	1.10						
Stakeholder			-0.07	1.20	-0.02	0.55			-0.09	1.32						
Health & safety			0.06	1.22	0.04	1.18			0.05	0.94						

	Model 1 Cont.		Model 2 Cont.		Model 3 Cont.		Model 4 Cont.		Model 5 Cont.		Model 6* Cont.		Model 7** Cont.		Model 8*** Cont.	
	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat	Coeff.	t stat
Innovation			0.15	2.41	0.06	1.91			0.12	1.34						
Customer & markets			0.03	1.25	0.03	1.05			0.03	1.22						
People			-0.08	1.28	-0.04	0.77			-0.08	1.33						
Composite strategy index							0.07	1.73	0.12	0.58	0.19	2.22	0.16	2.44	0.26	3.05
Constant	3.19	11.37	3.31	9.95	3.28	12.60	3.33	13.40	3.41	9.26	4.04	11.71	3.35	12.71	3.66	10.53
Adj R sq	0.73		0.60		0.59		0.74		0.73		0.79		0.67		0.66	
N obs	932		882		882		932		832		862		883		862	

Source: The Work Foundation. In each model the left-hand side variable is gross output, unless indicated otherwise. * indicates that the left-hand side variable in the model is output, measured in value added terms, rather than gross output; ** indicates that the left-hand side variable in the model is output per worker, rather than gross output; *** indicates that the left-hand side variable is value added per worker, rather than gross output.

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