productivity insights network

PIN - Productivity Projects Fund

Small Project Report

Performance measurement, productivity and management practices in smaller firms

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About PIN

The Productivity Insights Network was established in January 2018 and is funded by the Economic and Social Research Council. As a multi-disciplinary network of social science researchers engaged with public, private, and third sector partners, our aim is to change the tone of the productivity debate in theory and practice. It is led by the University of Sheffield, with co-investigators at Cambridge Econometrics, Cardiff University, Durham University, University of Sunderland, SQW, University of Cambridge, University of Essex, University of Glasgow, University of Leeds and University of Stirling. The support of the funder is acknowledged. The views expressed in this report are those of the authors and do not necessarily represent those of the funders.

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Table of Contents

Executive Summary

The research reported here is concerned with the links between the performance indicators used to guide decision-making at the business level, owner-directors' understanding and use of productivity as a performance measure, and the use of structured management practices to monitor and control performance within the firm, specifically in small businesses. The central motivation for our study was to question whether structured management practices, which are increasingly seen as universally beneficial for the improvement of productivity, are appropriate for smaller firms, where the motivations of business owners and the structure of processes and organisations vary widely, both between one smaller firm and another, and between smaller firms and larger firms. We conducted a small study, consisting of qualitative interview in twelve firms, and a pilot survey in two stages that eventually yielded responses from 49 firms.

The qualitative research showed that turnover is the most common business indicator used to guide business decision-making, but that others, such as year-on-year growth, are also used. Productivity is almost never used as a measure. Particularly in very small firms offering advisory services, a combination of service offerings that are difficult to specify and measure, and business models based on extensive use of external associates and subcontractors, make the conceptualisation, measurement and management of productivity still more challenging. Structured management practices were not a prominent feature of the owner-directors' approaches.

The pilot survey sample showed that a proxy for productivity was rarely used as a key performance indicator and was even less likely to be rated as an important one. This is consistent with the qualitative findings. It also showed considerable variation across companies in the use of particular indicators and in the total numbers of management practices used. Both of these were affected systematically by contingent factors. The number of practices used was strongly positively related to employment size and strongly negatively related to firm age in Services but there was no relationship in Manufacturing.

Attempts to explain business performance in terms of the use of management practices must take these contingent factors into account by adopting suitable selection modelling techniques. These could first model management practice use in terms of factors such as size and age and other contingent variables, and then run suitably adjusted second-stage equations which seek to determine the effects on productivity of the management practices, size and firm age.

A sufficiently high response rate in future surveys can only be achieved by ensuring the maximum accuracy of lists of directors' personal email addresses, ensuring a concise survey instrument, taking various steps to circumvent spam filters, and making extensive us of follow-up emails. Even then, it may be better to collect data using a large number of structured interviews, rather than a survey, since the former permits a deeper understanding from an owner-manager perspective.

1. Introduction

Small and medium-sized enterprises (SMEs) dominate the population of firms in the UK. Low productivity in many SMEs has been identified as an important factor in the continuing low productivity of the UK economy (BEIS, 2019). PIN Evidence Reviews[1] also identified this so-called 'long tail' of low-productivity SMEs, as well as the relative rarity of 'scale-up' firms and the challenges of the scale-up process, and our limited understanding of the link between SME growth and productivity-enhancing improvements.

Much discussion of variable productivity performance between firms explores why disparities in performance are not reduced by the weeding-out of low-productivity firms, either by competition and exit, or by the diffusion of improved products, processes and/or management practice. As such, it is important to understand how business responses to external pressures to change are mediated by performance measurement and management. More specifically, it is important to know whether productivity is measured by firms or is seen as a factor linked to meeting their business objectives.

A current policy emphasis is to diffuse best management practices to SMEs. Many of these practices concern performance management: KPIs, target-setting, measurement of performance and management of underperformance. It is therefore important to understand whether these practices, arguably designed for larger firms, are useful to SMEs and how they relate to productivity.

The study reported here cuts across these themes by examining the links between the measures that drive management decision and action in SMEs, and the management practices that are used. Our suggestion is that many SME managers and owner-managers are driven by a variety of key indicators other than productivity as such, and that a better understanding of the connection or otherwise between the measures used and the practices used will shed light on various aspects of the productivity problem. Our modest aim here has been to conduct a pilot study to explore the feasibility of conducting a full scale survey by which these questions might be systematically explored.

We conducted our research in two stages: semi-structured interviews with the owner-directors of a small number of SMEs, and then a pilot survey of SMEs, restricted to SMEs in the North West of England, in a small number of sectors. The qualitative interview stage helped us to understand the firms' business contexts; establish the indicators and measures used to drive management decision; explore their understanding and the use, if any, of productivity as a measure; and determine the firm's use of management practices directed toward performance management. In this way, we tested the basic premise of our argument, as well as the terminology to be used and the most appropriate data to collect in the next stage. In the survey, we collected data that allow us more systematically to determine the indicators and management practices used, and to identify the relationship between the use of measures and management practices and the characteristics of the firms. Since we intended to collect data in the survey on key firm and industry parameters, we hoped to be able to develop initial insight into how contingencies like firm size, industry dynamism, and ownership structure may determine appropriate performance-related management practices. In this sense, we could test the universality of the management practices argued by some to be so important to productivity.

[1] https://productivityinsightsnetwork.co.uk/publications-evidence%20Reviews/

The report is structured as follows. In the next section, we outline some of the background to the study, and set out our objectives in more detail. We then report, in turn, on the two stages of research: the qualitative interviews and the survey. These sections include an outline of the method, results and analysis in each instance. We then discuss the implications of the research as a whole, both for the substantive questions we raise, and for the design and execution of a more extensive survey building on this pilot.

2. Background and objectives

The enduring UK productivity gap has been well documented and addressed by various policy initiatives, and the relatively low productivity of many SMEs has been identified as an important contributory factor to this overall picture (e.g. BEIS, 2019). Bloom, van Reenen and colleagues have developed an extensively-cited literature, based on the World Management Survey (WMS) data, which examines the reasons for differences in productivity between firms, and argue that, amongst other things, the use or otherwise of 'structured management practices' is a determinant of productivity (Bloom and Van Reenen, 2007, Bloom and Van Reenen, 2010). While Bloom et al (2014) acknowledge that management practices may be more or less appropriate to firms depending on factors such as size or R&D intensity, i.e. a contingency argument, and SMEs with fewer than 50 employees are excluded entirely from the WMS data. This point is but briefly entertained in much of the survey-based literature on UK SMEs that has followed.

Recent ONS studies have, indeed, adopted many aspects of the WMS dataset and approach. A study of UK manufacturing firms (ONS, 2016) examined the relationship between management practices and productivity in firms with 10 or more employees. This found that smaller firms scored lower on structured management practices than did larger firms. A subsequent study (ONS, 2018) of businesses in both production and service industries, with employment of least 10, showed (a) a positive correlation between management practice score and labour productivity (b) higher structured management practices scores for larger firms (c) a greater range of structured management practice scores for smaller firms, especially those in the 10-49 employee category. The study also identifies a negative relationship between size and productivity, which the report's authors suggest '*may suggest some collinearity between management scores and employment*'. Finally, the study finds that firm age is correlated with labour productivity, which the report's authors see as *'satisfying our previous hypothesis that more mature businesses may have more structured practices because they have had longer to implement them.*' The inference here seems to be that lower productivity in smaller firms is a result of less use of structured management practices. The question we pose is whether lower scores on structured management practices among smaller firms tell us that they are managed worse, or managed in a way that is appropriate to their size. In our study, therefore, we will examine whether the particular features of SMEs lead them to develop practices that may, for good reasons, diverge from recently-advocated 'structured management practices', derived from studies of larger firms. This perspective is influenced by classic contingency theory arguments (Burns and Stalker, 1961, Woodward, 1958).

Productivity, in terms of GVA per job or per hour, is seen as the desirable outcome of economic activity at aggregate level. At firm level, managerial decision-making and action is determined by a host of factors which may or may not translate into improved productivity. In the smaller firms with which we are concerned, the directors are typically the majority owners, and the literature shows that these owner-directors are driven by widely varying sets

of motivations and priorities (Storey, 1994, Cosh and Hughes, 1998). These over-arching priorities and objectives are then linked, to a greater or lesser extent, explicitly or otherwise, into some form of monitoring and control process, centred on measurable indicators such as turnover, profit, or use of capacity (including that of the owner-director), which may or may not be directly related to productivity. In our study, we seek to develop insights into the behavioural foundations of these links, by examining whether SMEs either measure their productivity performance or understand it in the way it is used in policy debate. This is important since, if firms are not motivated to achieve productivity performance targets per se, then we must understand how the performance characteristics they do pursue are related to productivity itself. Put more specifically, we aimed to address the following key questions:

a) How does SME senior management define the overall business objectives of their firm and measure and respond to success or failure in meeting them?

b) What underlying operating performance and other indicators are used and how are they linked to overall business objective targets?

c) How, if at all, do measures of value-added productivity feature in objective-setting and performance measurement?

d) How are management practices (including monitoring operating and labour management practices) designed and implemented?

In pursuing these questions, we aimed to:

- conduct semi-structured interviews in 10 firms with fewer than 50 employees, in services and manufacturing, then
- use the insights from the interviews to design and pilot a web-based survey (target 30 achieved sample), using the FAME database as a sampling frame, to collect key firm and sector data, as well as more structured data on the key questions

3. Qualitative research

The primary purpose of the interviews was to explore and test out the topic areas of the intended survey instrument. Insights from the interviews were used to inform the scope of the survey questions and the terminology used, to maximise the relevance and comprehensibility of the questions posed. Interviewees were subsequently invited – and most agreed – to complete an early draft of the survey instrument and provide feedback on the clarity and appropriateness of the questions.

The interviews also provided some insights in their own right, beyond their function as a testing ground for the survey questions. These data are, of course, relatively limited in extent: we do not have in-depth case studies of the firms, nor do we have sufficiently large N that we can claim that the interviews are representative of particular sectors or sizes of firm. But they do point to some interesting themes that, as well as helping to inform the design of the survey, might be explored in greater depth in future research.

3.1 Research design and method

We conducted interviews with directors of 12 firms in service and manufacturing sectors. The firms ranged from one- or two-person micro-firms in sectors such as consultancy to larger SMEs such as a manufacturing firm with 76 employees and over £1.2million in net assets in 2019. All were contacted through the SME networks at Lancaster University Management School. In most cases, both investigators took part in the interviews, so as to maximise insight across the range of subjects and to provide the opportunity for reflective discussion of the data from different perspectives. Where possible, interviews were recorded and transcribed. All the initial interviews were conducted before the onset of the coronavirus pandemic.

In order to address the core concerns of performance and productivity management, and management practices, it was important to understand the nature of the businesses, organisation structures, the products and services they offered, and the customers they served. Hence, we spent a considerable portion of the interview in each case exploring these issues. We then directed the interviews toward the central questions of our research, as outlined in the project proposal, namely:

a) How does SME senior management define the overall business objectives of their firm and measure and respond to success or failure in meeting them?

b) What underlying operating performance and other indicators are used and how are they linked to overall business objective targets?

c) How, if at all, do measures of value-added productivity feature in objective setting and performance measurement?

d) How are management practices (including monitoring operating and labour management practices) designed and implemented?

(These questions were not asked verbatim, but acted as reference points for our more flexible exploration of the central concerns.) We concluded the interviews by asking respondents how they felt that they might be helped by government intervention.

We analysed the interview data using thematic analysis (Braun and Clarke, 2006, Clarke and Braun, 2017) to identify patterns of meaning across the dataset. The analysis was undertaken manually without using a software package, which allowed us to fully immerse ourselves in the data. This was appropriate to the relatively simple data structure (i.e. multiple interviews with people in essentially the same roles) and modest number of interviews.

3.2 Themes

The themes are reported broadly in the sequence of the topics covered in the interviews, although in practice we iterated back and forth between subjects in our conversations.

Size and structure of businesses

The firms varied a good deal, even within the ‘small’ end of the SME category. Several were very small /micro-firms operating in various forms of advisory work, such as branding or design consultancy. The firms also included manufacturers, IT providers and a construction

company. The micro-firms working in the advisory services sector had all been established by former employees of large consultancies or Fast Moving Consumer Goods (FMCG) manufacturers.

Although these are all clearly small firms, determining their size was not straightforward. Many operated some form of flexible staffing structure, with a core employed complement of staff supplemented by associates brought in and paid on a project-by-project basis. The construction firm operated a three-tier subcontracting structure among hourly-paid direct labour, with a core staff of full-time employees, a small number of dedicated sub-contractors, and third layer of subcontractors who also worked for other clients. In some senses, this is simple: associates are not employees of the focal firm, neither are subcontractors. But in other ways, the relationship is more ambiguous. For example, the MD of one of the very small advisory services firms saw the small network of associates as having a very significant role in determining the strategic direction of the firm: it could be said that this firm has more managers than it has employees. In contrast, the construction company's subcontractors were offered discrete pieces of work according to their technical specialism, and paid accordingly.

If we treat the firm as a production function, subcontractor inputs in all these cases are simply that – bought-in supplies. But if we treat the firm as a decision-making unit or governance structure, different pictures emerge, particularly so in some cases. Management control of performance as understood in the literature may only apply to the relationship between the MD and her administrative assistant. The relationships that are much more salient in many cases for the delivery of services are the relationships with associates and subcontractors, which, formally, are buyer-supplier relationships, not employment contracts.

Defining the product or service offered

Defining the product or service to be sold, and pricing and charging for it, was a difficult and fluid issue for many of the firms. Rather than using the billable hours model typical of some professional services, the small advisory firms would typically charge by the completed project. In some of these, however, the definitions of the work included had been rather flexible, meaning that staff were drawn into providing more work than had been budgeted for (in a more or less explicit fashion). For example, clients for branding or design consultancy might request more revisions, or choose among multiple alternative solutions. Firms in these cases were considering ways to delineate their offering in more clear-cut and pre-determined form, e.g. in the case of brand consultancy, undertaking to generate two possible solutions, and to carry out one round of amendments, rather than a more open-ended commitment. At the other end of the spectrum, the construction firm was often conducting work for clients such as local authorities where the quantum of work and the price for it was tightly defined in advance by the client e.g. a price per square metre for laying a particular type of paving, to a particular specification. This leaves little room for negotiation, and the construction firm could only differentiate the service (and the price) very slightly at the margins e.g. in ancillary activities such as transporting the materials to the site.

Some of the advisory service providers operated part of their business on a retainer basis for their clients. For example, a marketing communications consultancy might be paid a monthly or quarterly fee, undertaking to write a certain number of blog posts, and maintain the client's website. This has the attraction of offering stability and predictability of income. All these issues associated with defining the scope of work and the units by which work was defined and sold have implications for the way managers might understand and manage productivity.

Competition and visibility of future business

Such small advisory service providers have competitors in the sense of other firms providing similar services (although few seemed to know who they were). A recurring theme, however, was the idea that another competitor is the possibility of the client employing their own staff to fulfil the function being bought. Our advisory firm cases typically served SME clients, who could not justify having, say, a full-time marketing assistant, preferring to pay a retainer to an external provider, or buying services on a project-by-project basis. The additional benefit to the client in such instances is that, as well as obtaining day-to-day services on a more scalable basis, they also had the possibility of accessing more strategic advisory services from the provider's more senior staff.

While some operated part of their business on such retainer-based models, the more striking feature in the small advisory firms was the very limited forward order book. In some cases, the firms had very little idea what work they might be doing, for which clients, more than two months into the future. Firms in IT support, construction and manufacturing had generally greater visibility of future orders.

Performance measurement and management

Approaches to defining, monitoring and reacting to performance measures, at business level and at lower levels of aggregation, varied enormously. One, perhaps two of the firms we researched used anything that might be understood as a measure of productivity to guide the business (alongside other measures). Otherwise, a variety of other indicators were used, reflecting the directors' and managers' motivations and reasons for being in business, their established practices, and varying degrees of competence or interest in measurement and management control. In some cases, it still proved difficult, despite sustained questioning, to determine what indicators guided the management of the business.

Turnover was perhaps the most widely used indicator. The directors we interviewed had, to varying degrees of detail, an appreciation of how turnover for a recent month, quarter or year compared with that of previous periods. Sometimes this was the result of deliberate, active monitoring; in others, it seemed rather more happenstance e.g. because of having recently completed a mandatory report such as a quarterly VAT return. Turnover had, in some cases, been used as the basis for defining future strategies – the firms usually expressed an intention to increase turnover, typically modestly, year-on-year. In some cases this was linked to an intent to build the business to a size that would make it saleable. The MD of one of the very small advisory services firms has developed a simple 'KPI dashboard' that she used each Monday morning to review year-to-date turnover, dividends paid and costs, and to assess how these outcomes compare with intended targets for the year. These financial indicators are complemented by indicators concerning the identification of new clients, monitoring activities such as meeting new leads and sending out mailshots. These non-financial indicators had been important in identifying the need to take on an extra member of staff as the business grew. This was the most systematic approach to performance measurement among the very small advisory firms.

Control over financial indicators among other firms varied greatly. In one of the larger firms, in manufacturing, a finance manager maintained a suite of detailed performance indicators based on the popular 'balanced scorecard' method (this was also the firm that most convincingly measured productivity). In smaller firms, simpler methods were used, for example based on excel spreadsheets capturing recent, current and likely future orders and their values. In one case, it appeared that the MD only discovered what the turnover was,

and whether the firm had made a profit, well after the event at a monthly meeting with the bank manager. In another of the small advisory firms, a member of staff had been made redundant because annual financial analysis indicated that the wages as a percentage of total costs was too high.

We put it to the interviewees that productivity might be measured by adding wages to profits and dividing by the number of employees. Although many agreed that this might be useful, none (except the firm using the balanced scorecard approach) used this as a measure. Indeed, when asked how they might measure and report productivity, few had any clear idea. In some cases, this led to self-criticism or at least further reflection on the approach used for measurement, and an expressed intent to develop more effective measurement techniques. The construction company was the firm where the MD had the closest control over financial detail, including item-by-item costs for every project, monitored on an elaborate spreadsheet model. This perhaps reflects the very low-margin, commoditised and competitive nature of the market served.

Management practices

In keeping with the interpretation of 'management practices' adopted in the ONS surveys and the literature that informed them (Bloom and Van Reenen, 2007, Bloom and Van Reenen, 2010), we took the term to refer to practices for managing and controlling individual performance, rather than the much wider interpretation of the notion of practices as used in some areas of the management literature, for example 'strategy-as-practice' (Vaara and Whittington, 2012), or widely-used systemic approaches such as Total Quality Management (Sousa and Voss, 2008). In other words, we were mainly concerned with the methods used to measure performance of individual staff members and take action when performance fell short of requirements.

Again, the interviews revealed a very wide range of practices in this sense. In the very small firms, line management relationships were few: as we have discussed, several of these firms provide capacity though extensive use of associates on a project-by-project basis. For staff employed within the firm, formal systems were rarely used. Our interviewees typically felt that it was not worthwhile to establish formal systems by which to manage a handful of staff, with whom they in any case interacted informally on a regular basis. In the manufacturing firms, production data were usually available on an employee-by-employee basis, but even then, these data were used alongside a more informal assessment of individuals' capabilities, for example in allocating particular tasks to the most appropriate people.

3.3. Discussion and implications

Our interviews revealed a wide range of approaches to setting business objectives and measuring performance against them as a basis for triggering business decisions. We concluded that, although one or two of our firms measured something resembling productivity, it is generally not an important measure for the directors and managers we interviewed. They are much more likely to pay attention to turnover or profit as indicators of the need or otherwise to take action. Especially in small advisory service firms, the often rather ill-defined and fluid nature of the unit of output being sold made it difficult to nail down intermediate measures between aggregate retrospective outcomes such as profitability and a more subjective sense of whether particular individuals or activities are productive. This has implications for our survey in that we realised the need to be very inclusive in the range

of business indictors we suggested, and to explain in accessible terms what might constitute a measure of productivity in the sense of value-added per employee or hour worked.

As far as management practices are concerned, we once again found great diversity. In many of the micro firms, line management in the conventional sense was relatively unimportant, because so much of the work was conducted using associates acting effectively as subcontractors. When pressed, several of the managers in smaller firms felt they were less systematic and had less of a sense of urgency than they might in relation to managing under-performance. The larger firms used more detailed scrutiny of costs and other forms of performance, but no dominant systematised approaches were volunteered by the interviewees. Whether the more systematised approach in the larger firms was a result of their size, sectors (manufacturing and construction) or other factors was unclear, but these initial insights confirmed our instinct that a contingency-based analysis of management practices was worthy of exploration in the survey.

4. Survey

In this section, we describe the design and execution of the survey stage of the research, and present and discuss the results. This includes a review of the prior surveys and literature on which the survey design was based, and an account of the successive adaptations we made to the design and practical execution of the survey in order to improve response rate and in other ways mitigate the various difficulties we encountered.

4.1 Basic approach and scope of survey instrument

A starting point in the approach to developing our questionnaire was to review the ONS survey instruments that lie behind their estimates of UK management practices and productivity.

In the ONS surveys, a single score is derived for each respondent, which locates them on a Structured Management Practice Scale. Management Practices are not defined *per se* and the score is inferred from responses to a series of questions. For example, in the case of the initial ONS Manufacturing Practice Survey (MPS) these questions related to: responses to production problems; the number of key performance indicators and the frequency of their review; the time frame covered by production targets and problems attaining them; and promotion hiring and firing processes (ONS, 2016, Annex 3).

Thus in the following list of eight questions in this initial ONS survey, the numbers in brackets are the potential marks awarded to each answer. The scores are then averaged for each respondent with a minimum score of 0 (least structured) to a maximum score of 1 (most structured).

List of Management Practices Questions to derive Structured Management Scores (individual item scores in brackets)

Q1 In 2015, what generally best describes what happened at this business when a production problem arose?

a We fixed it but did not take further action (1/3)
b We fixed it and took action to make sure that it did not happen again (2/3)

c We fixed it and took action to make sure that it did not happen again, and had a continuous improvement process to anticipate problems like these in advance (1)
d No action was taken 0

Q2 In 2015, how many key performance indicators were monitored at this business?

a 1 to 2 key performance indicators (1/3)
b 3 to 9 key performance indicators (2/3)
c 10 or more key performance indicators (1)
d No key performance indicators 0

Q3 In 2015, how frequently were the key performance indicators reviewed at this business?

a Annually 1/6
b Quarterly 1/3
c Monthly 1/2
d Weekly 2/3
e Daily 5/6
f Hourly or more frequently 1
g Never 0

Q4 In 2015, what best describes the time frame of production targets at this business?

a Main focus was on short-term (less than one year) production targets 1/3
b Main focus was on long-term (more than one year) production targets 2/3
c Combination of short-term and long-term production targets 1
d No production targets 0

Q5 In 2015, how easy or difficult was it for this business to achieve its production targets?

a Possible to achieve without much effort 0
b Possible to achieve with some effort 1/2
c Possible to achieve with normal amount of effort 3/4
d Possible to achieve with more than normal effort 1
e Only possible to achieve with extraordinary effort 1/4

Q6 In 2015, how were employees usually promoted at this business?

a Promotions were based solely on performance and ability 1
b Promotions were based partly on performance and ability, and partly on other factors, such as tenure 2/3
c Promotions were based mainly on factors other than performance and ability, such as tenure 1/3
d Employees are normally not promoted 0

Q7 In 2015, when was an under-performing employee moved from their current role?

a Within 6 months of identifying employee under-performance 1
b After 6 months of identifying employee under-performance 1/2
c Rarely or never 0

Q8 In 2015, who made decisions over the hiring of permanent full-time employees?

a Only the owner(s) 0
b Mostly the owner(s) with some input from other employees 1/3
c Jointly the owner(s) and other employees 2/3
d Other employees 1

Notes:

1 For Question 3 respondents were asked to mark all options which applied. The score was determined by the most frequent option selected. Where respondents marked for Question 2 that they had no key performance indicators, they were given a score of zero.
2 Where respondents indicated in question 4 that they did not use targets, they were given a score of zero for question 5.

Source: Office for National Statistics (2016) Annex

Later ONS Management practice surveys have used the same methodology but amended the question structure to bring it closer to the US Census Bureau Management and Organisational Practice Survey (MOPS[2]) - see also Buffington et al. (2017)). Thus the ONS Management and Expectations Survey (MES) (ONS, 2018) extends the industry coverage to include some services. It also groups a wider range of questions under four broad management practice headings:

- continuous improvement practices measuring how well the firm monitors its operations and uses monitoring information for continuous improvement
- key performance indicators (KPIs) measuring (as in MPS) how many KPIs the firm has and how often they are reviewed, but not listing different KPIs
- targets asking are the firm's targets stretching, tracked and appropriately reviewed?
- employment practices, as in MPS, asking is the firm promoting and rewarding employees based on performance, managing employee underperformance and providing adequate training opportunities?

The MES questionnaire also includes a new section on organisational practices. In this section, questions are included to measure the degree of a firm's decentralisation of decision making. Finally, there is a section on business performance expectations in terms of turnover, capital investment and employment, and expectations of future growth of UK real gross domestic product (GDP).

Most recently MES2020, which went into the field in late 2020, keeps the core structure of MES (ONS, 2020).

A notable feature of these important and influential surveys is that there is no unpacking of key performance indicators (KPIs). All that is measured is their total number. More KPIs is inferred to mean more structured management. This in turn feeds positively into the total "structured management" score that a firm gets. The second feature is that alongside the KPI score they infer the degree of structure in management practices on the basis of scores attributed to item responses to behavioural questions. These ask about how a firm responds to underperformance; handles the hiring and firing processes; and the frequency of KPI monitoring.

We built on these valuable and careful surveys in a number of ways. In the description below of how we did this, we focus on the common questions asked in our 2019 and 2020 surveys[3]. It is also useful to note the time period we asked about. To reduce the distorting effect of Covid-19 we asked respondents about the period prior to the outbreak of the pandemic rather than their current (Covid-affected) experience. Finally, small firms are typically closely controlled, with CEOs owning majority stakes (Storey, 1994, Cosh and Hughes, 1998). We therefore sought responses from CEOs or Managing Directors.

[2] https://www.census.gov/programs-surveys/mops.html
[3] The survey instruments are reproduced in full in Appendices 1 and 2

Our first step in advancing from the ONS/MOPS template was to ask about the types of KPIs used and not just the number of them. We also asked about them at the level of the company as a whole rather than at the level of underlying production process or task-based measures implicit in the ONS/MOPS approach. This reflected our interest in assessing the extent to which productivity featured as a business objective in CEO/Managing Director decision making. In doing this we drew up a list based on insights from our case interviews and specifically included a proxy measure for productivity. We asked whether or not each KPI was used and how much importance was attached to each. Answers here enable us to address our first underlying question about the use of productivity as a performance indicator and its importance relative to other KPIs.

The KPIs about which we sought information are shown in Figure 4.1 as they appear in the relevant question in the survey instrument The productivity proxy is in bold (variable: Performance08).

This proxy uses financial and management accounts data available to most businesses and has been used in previous econometric studies of productivity using FAME data (e.g. Faggio et al., 2007).

Considering the two years leading up to the Coronavirus outbreak, please indicate the importance you attached to the following indicators of performance of your business as a whole.

Please tick the appropriate box in each row.

	Do not use it	Moderately High	High	Very High	
Level of Profits	1	2	3	4	**Performance01**
Profit Margin on Sales/Turnover	1	2	3	4	**Performance03**
Profitability (Return on Assets)	1	2	3	4	**Performance04**
Growth of Sales/Turnover	1	2	3	4	**Performance05**
Turnover per Employee	1	2	3	4	**Performance06**
Profits per Employee	1	2	3	4	**Performance07**
Wages plus Profits per Employee	1	2	3	4	**Performance08**
Other indicators(Please leave this row blank if there is no other indicators)	1	2	3	4	**Performance09**
	1	2	3	4	**Performance10**

Figure 4.1 – Performance Indicators question

Our second development was to derive a list of management practices. This built on the insights from our interviews and on the existing literature on management practices (Bloom

and Van Reenen, 2007, van Wanrooy et al., 2013, Guest et al., 2003, Sheehan, 2014). The resulting list is shown in Figure 4.2, reproduced as it appears in the survey instrument.

The list has some implicit overlaps with the item options offered in the ONS/MOPS approach. Our instrument simply asked about them directly. This is in contrast to inferring a degree of "structuredness" based on scoring itemised responses to a set of recollected or hypothetical circumstances (as is the case with the ONS/MOPS approach).

Does your firm use the following management practices in relation to any of your staff?

Please tick appropriate box in each row.

	YES	NO	
Formal performance target-setting with staff			**Mngprac1**
Regular one-to-one performance reviews with staff			**Mngprac2**
Performance-related pay (individual or group)			**Mngprac3**
When appropriate – structured disciplinary processes to address performance shortcomings			**Mngprac4**
When appropriate- structured training and development to address performance shortcomings			**Mngprac5**
Pro-active career development			**Mngprac6**
Off-the-job training (excluding health and safety)			**Mngprac7**
Teamworking, where team members jointly decide how work is to be done			**Mngprac8**
Regular briefings to staff on company performance and prospects			**Mngprac9**

Figure 4.2 – Management practices question

In addition to these core questions we also asked a range of others. These relate to the degree of centralization of decision taking, the extent of use of management accounts and strategic planning, and the periodicity of plan reviews.

We are interested in the contingent determinants of the scale and nature of management practices used by firms. We therefore asked each of the survey firms about their employment size, age and the number, size and international nature of their competitors. We also sought to capture the nature of the processes used to produce the firm's goods or services, and also the way tasks were organized in the business. We derived proforma descriptions of categories of process and task organization. We based these on classic contingency theory arguments and asked firms to place themselves in these categories (Burns and Stalker, 1961, Woodward, 1958).

The proforma descriptions are shown in Figure 4.3, reproduced as they appear in the survey instrument.

Which of the following statements most closely describes the process used to provide goods or services for your customers in normal times? Please tick one box (process0)

□ Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer
□ There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs
□ Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything
□ None of the above statements closely describes the process used to provide goods or services to my customers

C4Which of the following most closely describes the way tasks are organised in normal times in your company? Please tick one box (Organise0)

□ The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence
□ The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks
□ Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication
□ None of the above statements closely describes the way tasks are organised in my company

Figure 4.3 Contingency factors question

Finally, we tried to capture the extent to which management practices had a positive or negative effect on business performance. We did this by including them in a list of possible factors affecting small business performance. This was drawn from the existing literature on small firms (Guest et al., 2003, Sheehan, 2014, Storey, 1994). The list is shown in Figure 4.4, where the management factors are bolded

Considering the two years leading up to the Coronavirus outbreak, which of the following factors had a significant positive or negative effect on your ability to meet your business objectives?

Please tick the appropriate box in each row ranging from 1 (a significantly negative effect) to 5 (a significantly positive effect).

	Very Significant Negative Effect	Moderately Significant Negative Effect	Neither Significant Negative or Positive Effect	Moderately Significant Positive Effect	Very Significant Positive Effect	
Availability and cost of finance for expansion						Factor01
Availability and cost of overdraft finance						Factor02
Access to Skilled labour						Factor03
Management skills						Factor04
Effectiveness of your firm's management practices						Factor05
Marketing and sales skills						Factor06
Acquisition of technology						Factor07
Ability to implement new technology						Factor08
Availability of appropriate premises or site						Factor09
Access to overseas markets						Factor10
Growth of demand in principal product markets						Factor11
Changing intensity of competition in principal product markets						Factor12

Figure 4.4 Factors affecting business performance question

4.2 Survey Design

In February 2019, from our FAME sampling frame, we first selected all active companies in nine selected industries with a post code address in the North West Region and a company website. From that group we then selected those with total assets of between £300K and £10,000K in any one of three latest accounting years in the database. We chose to use one of three years because of the known short-term variability in SME growth rates which could tip companies just below or above the cut-off point in any one year.

We then downloaded the detailed Fame accounts records for each company and using the fields for Directors identified email contact addresses. The distribution of the whole sample by industry and size class is shown in Table 4.1, Columns 1-4, along with numbers with email contacts in rows 5-7.

Table 4.1 Sample from FAME with email address

Industry	All Companies Selected	Size Band 1 **£300K-2,500K**	Size Band 2 **£2,500K-5,000K**	Size Sand 3 **£5,00K-10,000K**	All Companies in Col 1 with a Director's email address **BY FUNCTIONS OF THE CONTACT**		All 2017 Companies in Col 1 with an email address
					Executive (CEO, MD, Director)	**Non-Executive Contact**	
20	172	96	50	26	89	26	115
21	30	16	4	10	9	4	13
26	128	99	17	12	72	19	91
27	129	95	23	11	63	23	86
28	335	247	59	29	166	48	214
69	498	425	48	25	174	48	222
62	662	546	72	44	245	93	338
56	297	235	33	29	52	20	72
87	231	169	42	20	54	30	84
All	**2482**	1928	348	206	**924**	311	**1235**

Table 4.1 shows that there were 2482 companies that met our core selection criteria. As might be expected, given the well-known highly skewed distribution of company sizes, around 78% (1928 firms) were in the smallest size class. Column 5 shows that from the accounts of the sample as a whole we were able to get 924 executive level email contacts accounting for around 37% of all companies selected and also to obtain 311 non-executive contacts. Column 8 shows that we were able to obtain 1235 contacts in total, which is around 50% of our total sample.

In an attempt to augment our number of companies with executive email contacts we used our FAME company and individual director names data to search for email contacts using the Norbert executive address finder website[4]. We did this for the 311 companies without executive emails from FAME and for the 1247 (2482-1235) companies without any email addresses from FAME.

The results are shown in Table 4.2 by industry and type of contact. In reading Table 4.2, it is important to note that companies have more than one director for whom we sought contact details. Thus column 2-4 relates to numbers of directors whilst column 6 shows the number of companies where Norbert found at least one contact email and column 7 shows the total number of email contacts found. Column 8 shows the total number of Director searches and column 9 the percentage of Director searches yielding contacts. The latter varies across industry from 11.76% to 25.93%

[4] https://www.voilanorbert.com/

Table 4.2 Email Addresses Available from Norbert: By Contact Position

Industry	CEO	MD	Director	Other	Number of Companies	All email addresses available	Number of Searches Processed in Norbert	Proportion of Successful Searches
20	0	1	30	0	23	31	171	18.13%
21	0	0	4	0	3	4	34	11.76%
26	0	1	25	3	21	29	129	22.48%
27	1	3	21	4	20	29	156	18.59%
28	1	7	69	10	58	87	351	24.79%
69	1	13	115	27	94	156	743	21.00%
62	0	8	163	38	132	209	806	25.93%
56	1	2	66	10	48	79	554	14.26%
87	2	3	75	8	45	88	496	17.74%
All	6	38	568	100	**444**	712	3440	20.70%

This process added 444 new companies to the survey sample as shown in column 6.

Overall, this combined FAME and Norbert search yielded executive level email addresses for 1368 companies (924 companies from FAME and 444 companies from Norbert). When we merged the two lists we discovered that, because we had searched within each industry separately, there were some overlaps. Some companies were listed twice (in different industries) and in addition, some directors were contacts for more than one company. Removing duplicates reduced the final sample size with unique contacts to 1237.

We began the survey in October 2019 using the contact details for these companies. The survey plan was for an initial mailing followed by two prompts. However, a very high level of undeliverable bounce backs (431 cases) meant that Lancaster University IT services generated an automatic hold on further mailings.

We therefore undertook a further independent check on the reliability of our contact details using Hunter io[5] which in addition to contact searches has a verification tool which assigns deliverability risk assessments to contact details. We also tried to obtain new contact details for the subset of 431 bouncebacks using the web domain search tool on Hunter io. The domain search tool yielded 41 new directors and their email addresses and 9 cases with new contact addresses for existing directors in the sample. So we updated and added those new details for them in the sample of 1287. We carried out the Hunter io verification check on the original full 1287 sample. The result showed 482 classified as deliverable, 653 with various degrees of risk and 152 as undeliverable. We therefore mailed out 1135 invitations (482+653). Of these 200 still bounced back as undeliverable. So our final mailing of deliverable plus risky was 935 but it produced a total of only 13 responses after two prompts. This yielded a disappointing unit response rate of 1.9% which achieved only around one half of the target of 30 returns proposed in the project specification.

In view of this response rate and the need to boost the sample we decided to experiment by shortening the survey. We also personalised the “From” details in the email invitation so that it named name Professor Spring rather than using a Lancaster email survey box address. Since the survey would take place in July during lockdown because of the COVID-19 outbreak we included a brief section on the impact of COVID and its interrelationship with

[5] https://hunter.io/

Management Practices. This was an attempt to improve response rates by making it more relevant to the conditions that were affecting companies at that time.

We also refreshed the FAME sample using the same selection criteria but drawing upon any revisions to the FAME data due to the addition of more recent company accounts data. We also reran the Hunter io verification checks on this refreshed sample.

Of the original 1287, 101 failed to meet the selection criteria because they fell outside the asset size limits or were no longer active. We gained 264 entirely new companies and contacts. There were 248 cases where we identified new contacts for an existing company. We decided that we should not approach companies with contacts we had approached before. In effect, this was a new survey draw from our original sample where the contact had not previously been approached.

We ran a Hunter io verification check on this combined group of 512 companies. The check showed 197 (38.5%) deliverable. 269 (52.5%) as risky deliveries and 46 (8.9%) as undeliverable. We selected the first two of these groups. This produced a survey sample of 438 companies. When the survey was launched 58 contacts bounced back as undeliverable leaving a final delivered sample of 404 companies from which we received 25 responses thus yielding a unit response rate of 6.1%. This was much higher than the first survey and most likely the result of shortening the survey and refreshing the sample. It is important to note that this higher rate was achieved in the midst of the COVID lockdown and in a severe economic recession.

The combined sample from the two surveys was thus 38 to which we added the survey returns of the 11 case study interview firms. This yielded a total achieved sample of 49 companies compared to the target of 30.

Of the 49 respondents, 40 answered all the questions that were common to the long and shortened questionnaires (thus excluding, for example, the COVID questions). They did so with no missing values and therefore for this 40 an item response rate of 100% was achieved on all questions.

We concentrate on this sample of 40 companies in describing the results. Since the number of responses yielded very few observations in some industries, in the analysis that follows we aggregate the industries into two broad sector groups of Manufacturing and Services.

4.3 Results

The Sample

Table 4.3 shows the distribution of the 40 sample companies by sector, employment total assets and age.

The sample is roughly equally split between manufacturing and services and over half the sample employ between 11 and 40 employees and over 70% have less than £4m in total assets. There is a wide age range with nearly a third less than 20 years old over a quarter 40 years old or more.

Table 4.3 Distribution of Sample Companies by Sector, Employment Size, Total Assets and Age

	Number of Companies	Percentage of Companies
All Companies	40	100
Manufacturing	21	52.5
Services	19	47.5
Employment <10	7	17.5
Employment 11<20	10	25
Employment 21<40	12	30
Employment >40	11	27.5
Total Assets < £1 m	15	37.5
Total Assets £1m < £4m	14	35
Total Assets >£4m	11	27.5
Age <20	13	32.5
Age 20<30	7	17.5
Age 30<40	9	22.5
Age =>40	11	27.5

In the analysis of responses to survey questions we use the groupings shown in Table 4.3 as the basis for comparing variations in responses across sector, size and age.

Table 4.4 contains summary descriptive measures by the same four variables for the sample as a whole and split by services and manufacturing. Employment in the whole sample ranges from 1 to 109 employees and total assets from less than £100,000 to over £8m. The youngest firm is 8 years old and the longest lived has been in existence for over 70 years. The distribution by either measure of size is positively skewed with the median less than the mean. For manufacturing, the median size is 25 employees and for services is 21 employees. The sample is suitable for our purposes. It contains a range of firm sizes within the small enterprise category and allows comparisons across size and age groups and across broadly defined sectors. A full analysis of the answers to every survey question cross cut by size, age and sector is presented in Appendix 1. Here given the resources available for this small PIN project we focus on core questions related to key performance indicators and management practices and on size, sector and age as contingent variables. We first present univariate descriptives and some primarily non-parametric statistical tests. We then present some exploratory multivariate regression analyses on the determinants of the use of management practices.

Univariate Analysis

In addition to presenting sample descriptives Table 4.4 also shows in bold where statistically significant differences[6] occur.

There are no statistically significant differences in employment size between sectors, but service sector firms have on average, as might be expected, lower total assets. They are also on average around ten years younger.

[6] Throughout this section we use the following tests; Chi squared Two-sample Test of Proportions, the non-parametric Mann Whiney test for differences in means, the median test (corrected for continuity were required) for differences in medians and the non-parametric Kruskall-Wallis test for comparisons of difference across 3 or more categories (corrected for ties where required) (see Siegel, Sidney, and N. J. Castellan (1988) *Nonparametric statistics for the behavioral sciences*, McGraw-Hill, New York.)

Table 4.4 Sample Descriptives

		All Companies	Manufacturing Companies	Service Companies
Employment	Minimum	1.0	9.0	1.0
	Maximum	109.0	86.0	109.0
	Mean	32.7	31.3	34.3
	Median	25.0	25.0	21
	Standard Deviation	27.6	20.3	34.5
Total Assets £m	Minimum	<0.1	0.4	<0.1
	Maximum	8.1	8.2	5.8
	Mean	**2.3**	**3.1***	**1.5***
	Median	1.5	2.4	1.1
	Standard Deviation	2.2	2.4	1.5
Age	Minimum	8.0	15.0	8.0
	Maximum	73.0	73.0	72.0
	Mean	**31.8**	**37.1****	**26.0****
	Median	**31.0**	**38.0****	**25.0****
	Standard Deviation	16.5	16.1	15.2

Note * significant difference at 10% level ** significant difference at 5% level

Key performance indicators

Table 4.5 shows the use and importance of key performance indicators (KPIs) in the sample. The level of reliability across the measures (Cronbach's alpha 0.73)[7] is acceptable enough to consider the measures as a consistent group. The value added proxy KPI for productivity is shown in the second last row. The first column shows the proportion using a particular KPI and the other columns show the importance attached to each.

Table 4.5 The Use and Importance of Performance Indicators

The Use and Importance of Performance Indicators	All Companies (Percentage of Companies)			
	Used	Slightly Important	Important	Highly Important
Level of Profits	100.0	12.5	50	37.5
Profit Margin on Sales/Turnover	97.5	17.5	45	35.0
Profitability (Return on Assets)	72.5	30.0	32.5	10.0
Growth of Sales/Turnover	97.5	42.5	37.5	17.5
Turnover per Employee	47.5	30	10	7.5
Profits per Employee	42.5	20	15	7.5
Wages plus Profits per Employee	32.5	12.5	15	5.0
Other indicator (3 selected)		0.0	33.3	66.7

[7] "Level of Profits" is used by all companies. It is therefore a constant in the analysis and dropped from the calculation.

The level of profits, profit margin on sales and the growth of sales are used by virtually all the sample companies. Of these the first two are also most frequently rated as highly important. In general KPIs linked to employment are used by less than half the sample and are infrequently cited as being highly important. The productivity proxy KPI is the least used (32.5%) and only 5% of respondents regard it as highly important. It appears that the pursuit of productivity is not seen as an important KPI by the typical businesses in this sample.

We tested for differences in the use and importance of individual KPIs across sectors, and across our size and age groups. We found no statistically significant differences except in the case of the little used productivity proxy KPI where there were variations across employment size groups. (Kruskall Wallis corrected for ties p= 0.097, significant at 10% level).

Management Practices

We asked about nine specific management practices (MPs). There is a reasonable degree of reliability across these MP items (Cronbach's alpha = 0.75) which is acceptable enough for us to consider the MPs as a consistent group.

Table 4.6 sets out the use of MPs for the sample as whole and for the manufacturing and service sectors. The Table shows that there is considerable variation in the use of particular MPs. The MP "Regular briefings to staff on company performance and prospects" is used by over 80% of the sample companies and "Regular one-to-one performance reviews with staff" and "Structured training and development to address underperformance" are both used by 75% of the sample. "Performance-related pay (individual or group)" is the least used with less than half the sample reporting it. There are some variations in the frequency of use across the two sectors but none of them are statistically significant. With one exception, we found no statistically significant variation in frequency of use across our size and age groups. The exception was Off-the-job training (excluding health and safety) which was least used in the 30-40 age range (22%) compared to 69.2%, 85.7%, and 70% in the other three age categories (KW corrected for ties .0455 p=5%)

Table 4.6 The Use of Management Practices

The Use of Management Practices	All Companies		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Formal performance target-setting with staff	19	47.5	8	38.1	11	57.9
Regular one-to-one performance reviews with staff	30	75	14	66.7	16	84.2
Performance-related pay (individual or group)	19	47.5	10	47.7	9	47.4
Structured disciplinary processing to address staff underperformance	27	67.5	14	66.7	13	68.4
Structured training and development to address underperformance	30	75	16	76.2	14	73.7
Pro-active career development	26	65	14	66.7	12	63.2
Off-the-job training (excluding health and safety)	24	61.5	12	57.1	12	66.7
Teamworking, where team members jointly decide how work is to be done	27	67.5	15	71.4	12	63.2
Regular briefings to staff on company performance and prospects	33	82.5	18	85.7	15	70.0

So far we have considered the extent of use individual MPs. We now turn to the extent to which companies use multiple MPs. Table 4.7 analyses this for the whole sample and for our standard subgroups. The median number is 6 out of 9 for the sample as whole and varies between 5 and 8 out of 9 considering all the different subgroups. There are some companies who report none at all and some who report using them all. None of the differences in the numbers used across groups are statistically significant.

Table 4.7 The Number of Management Practices used by Companies

	Number of Companies	Minimum	Maximum	Mean	Median
All Companies	39	0	9	6.0	6
Manufacturing	21	2	9	5.8	6
Services	18	0	9	6.3	7
Employment <10	6	0	8	4.3	5
Employment 11<20	10	2	9	5.8	6
Employment 21<40	12	2	9	6.6	7
Employment >40	11	4	9	6.6	7
Age <20	13	4	9	6.4	7
Age 20<30	7	2	9	6.6	8
Age 30<40	9	0	8	5.1	6
Age =>40	11	0	9	5.5	6

Multivariate Analysis: The Determinants of the Use of Management Practices

In this section, we carry out an exploratory multivariate logit regression analysis of the determinants of use of each of the 9 MPs shown in Table 4.6. The dependent "contingent" variables include full time equivalent employment size and age (both in logarithmic form because the underlying distributions are not normal (normality rejected in both cases using Shapiro Wilk W test), a sector dummy variable (Mfg =1) and three motivational variables[8].The dependent and other variable names and definitions are shown in Table 4.8.

Table 4.8 Variables: Important reason for Involvement in the Business, and Management Practices

Increase the current and future value of the business	**businve01IMP**
Increase personal or family wealth	**businve02IMP**
Build a business to generate wealth through sale to non-family members	**businve08IMP**
Formal performance target-setting with staff	**mngprac1**
Regular one-to-one performance reviews with staff	**mngprac2**
Performance-related pay (individual or group)	**mngprac3**
Structured disciplinary processing to address staff underperformance	**mngprac4**
Structured training and development to address underperformance	**mngprac5**
Pro-active career development	**mngprac6**
Off-the-job training (excluding health and safety)	**mngprac7**
Teamworking, where team members jointly decide how work is to be done	**mngprac8**
Regular briefings to staff on company performance and prospects	**mngprac9**

The results of the logit regression are shown in Table 4.9. Employment size has a positive effect in each case and statistically significant so in the cases of; regular one-to-one performance reviews; performance-related pay; structured disciplinary processing for underperformance; and structured training to address underperformance; and pro-active career development. Age has a uniformly negative impact which is statistically significant in the case of regular one-to-one performance reviews; performance-related pay; and structured disciplinary processing for underperformance.

[8] We experimented with multiple combinations of other contingent variables including measures of task organisation and business process type and number of competitors. The limited number of degrees of freedom in the small pilot sample means that we focus on an illustrative example here including the key contingent variables of age and size.

Table 4.9 Determinants of the Use of Management Practices: Logit Regression

Dependent Variables:	mngprac1	mngprac2	mngprac3	mngprac4	mngprac5	mngprac6	mngprac7	mngprac8	mngprac9
ln(FTEEMP)	0.440	1.373**	1.281**	0.850**	1.023**	0.886**	0.439	0.539	0.404
	(0.384)	(0.649)	(0.557)	(0.436)	(0.480)	(0.447)	(0.399)	(0.450)	(0.529)
ln(Age)	-0.601	-1.935*	-3.003**	-1.456*	-0.973	-0.820	-0.397	-0.138	-0.974
	(0.730)	(1.156)	(1.175)	(0.846)	(0.888)	(0.827)	(0.755)	(0.801)	(1.029)
Mfg	-0.844	-1.736	1.014	0.041	0.007	0.120	-0.307	0.118	0.658
	(0.729)	(1.168)	(1.000)	(0.807)	(0.912)	(0.858)	(0.787)	(0.834)	(1.006)
businve01IMP	0.247	1.503	0.502	-0.245	0.897	1.899*	-0.023	-0.653	1.832
	(0.925)	(1.155)	(1.200)	(1.036)	(1.019)	(1.062)	(1.003)	(1.095)	(1.136)
businve02IMP	0.374	0.660	2.074**	0.096	0.609	1.201	0.947	2.121**	1.619
	(0.703)	(0.912)	(1.012)	(0.780)	(0.843)	(0.802)	(0.740)	(0.836)	(0.994)
businve08IMP	-0.800	-1.733	-0.566	-0.834	-0.027	-0.340	1.118	-0.457	-1.029
	(0.745)	(1.159)	(0.955)	(0.912)	(1.083)	(0.969)	(0.950)	(0.947)	(1.225)
No. Obs	40	40	40	40	40	40	39	40	40
Pseudo R2	0.073	0.258	0.287	0.117	0.162	0.217	0.098	0.186	0.222

The manufacturing dummy varies in sign and is never statistically significant. The motivational variables vary in sign across MPs. The coefficient on increasing personal or family wealth is always positive, and statistically significantly so in the case of performance related pay, and teamworking. The effect of the desire to increase the value of the business personal varies in sign but was positively statistically significantly (at 10% level) linked to pro-active career development practices. These exploratory results suggest that some management practices may be more prevalent when owner managers are driven by strong personal or business wealth building motivations. This is worthy of further elaboration in future work.

Multivariate Analysis: The Determinants of the Number of Management Practices Used

In this section, we report the results of an exploratory multiple regression analysis of the determinants of the number of practices used by the sample companies. We focus on size and age.

Since both the dependent and independent variables are highly skewed, each enters the regression in log transformation. In view of potential multi-collinearity between age and size (correlation coefficient 0.3495 significant at 5% level) we report variance inflation factors. All regressions are reported with heteroscedastic robust standard errors. About 25% of the variation in number of MPs used by the sample companies is explained by size and age. Employment size is positively and statistically significantly related to the number of MPs used. Age is negatively and statistically significantly related to the number of MPs used.

Table 4.10 The Determinants of the Number of Management Practices Used: Whole Sample

	Coef	Robust Std. Err	t-Value
Log(FTEEMP)	0.511**	0.238	2.14
Log(Age)	-0.683**	0.301	-2.27
Constant	2.219**	0.715	3.1
R-squared	0.246		

Note: ** significant at the 5% level, N=40

Variable	*VIF*	*1/VIF*
Log(Age)	1.18	0.844
Log(FTEEMP)	1.18	0.844
Mean VIF	1.18	

Note: *In general a VIF > 10, indicates high multi-collinearity. Our values are around 1 which means we can conclude that we do not have a serious problem and can interpret the results accordingly.*

To test for sector effects we ran the regressions for manufacturing and service sector firms separately. The results are shown in Tables 4.11 and 4.12. In neither case is there a collinearity problem in the estimated equation. There is, however, a marked difference between the two sectors. Neither the age nor size coefficient is statistically significant in manufacturing, although the signs are the same as for the whole sample. In services both coefficients are statistically significant (size positive and age negative) and the equation accounts for over 40% of the variation in numbers of MPs used across companies. This suggests that sample results for all companies combined are driven by the services companies.

Table 4.11 The Determinants of the Number of Management Practices Used in Manufacturing

	Coef	Robust Std. Err	t-Value
Log(FTEEMP)	0.183	0.141	1.30
Log(Age)	-0.096	0.175	-0.55
Constant	1.424	0.561	2.54
R-squared	0.064		

Note: N=21

Variable	*VIF*	*1/VIF*
Log(Age)	1.18	0.846
Log(FTEEMP)	1.18	0.846
Mean VIF	1.18	

Table 4.12 The Determinants of the Number of Management Practices Used in the Services Sector

	Coef	Robust Std. Err	t-Value
Log(FTEEMP)	0.621**	0.279	2.23
Log(Age)	-1.400**	0.616	-2.27
Constant	3.900	1.531	2.55
R-squared	0.410		

Note: ** significant at the 5% level, N=19

Variable	*VIF*	*1/VIF*
Log(Age)	1.16	0.865
Log(FTEEMP)	1.16	0.865
Mean VIF	1.16	0.865

Implications of the Multivariate Regression Analyses

These exploratory small sample results are potentially important to interpreting single equation estimates of the effects on poor productivity performance of the under-use of structured management practices by small firms (e.g. ONS, 2016). Such estimates may be confounded by picking up contingent size and age effects. This suggests that a selection model approach should be adopted to testing the link between management practices and small firm productivity. This would first condition use of management practices in terms of size and age (and other contingent variables)and then use a selection-corrected regression analysis of impact of their use on productivity.

The results also suggest that the determinants of the number of practices used varies by the broad sectors used here so that industry effects need to be included in selection modelling. These are, however, small-sample exploratory results and require much larger samples to assess their robustness.

5. Concluding discussion and suggestions for further work

In this section, we draw together and discuss the main findings from our qualitative and survey research. We examine the findings both in terms of the substantive questions we set out to address, and, particularly in respect of the survey, the lessons we have learned about how to conduct a full-scale study of this kind. We also comment on some of the obstacles we faced and their impact on our ability to satisfy all the objectives we set ourselves at the outset in this small PIN project.

Overall, we have achieved our main objective of conducting a pilot survey of sufficient scale to provide insights into the design and conduct of a full-scale survey into performance measurement, productivity and management practices in smaller firms. For a variety of reasons, which we discuss in section 5.3, we have not been able to produce all the outputs that we had hoped we might, and our opportunities for wider engagement and dissemination have been curtailed. We nevertheless anticipate that the approach and findings summarised in this report can be further explored and exploited with relevant interested parties, after the formal conclusion of the PIN project period.

5.1 Principal insights on productivity and management practices

The main key performance indicators used by business directors to guide their decision-making are the level of profits, profit margin on sales and the growth of sales, with the first two most frequently rated as highly important. In general, KPIs linked to number of employees are used much less, and are infrequently cited as being highly important. The productivity proxy KPI of wages plus profits divided by number of employees is the least used (32.5%) and only 5% of respondents regard it as highly important. It appears that the pursuit of productivity is not seen as an important KPI by the typical businesses in our sample.

The findings of the pilot survey sample showed that a proxy for productivity was rarely used as a key performance indicator and was even less likely to be rated as an important one. This is consistent with the qualitative findings. In relation to management practices, the analysis of the survey responses showed considerable variation across companies in the use of particular indicators and in the total numbers of practices used. Both of these were affected systematically by contingent factors. The number of practices used was strongly positively related to employment size and strongly negatively related to firm age in the services sector. Attempts to explain business performance in terms of the use of

management practices must take this into account by adopting suitable selection modelling techniques. These first model management practice use in terms of contingent factors such as size and age and then run suitably adjusted second-stage equations which seek to determine the effects on productivity of management practices, size and firm age.

5.2 Lessons learned on designing and conducting a full-scale survey

The interviews proved useful in helping to frame questions about performance indicators and especially in the decision to including a performance measure using the sum of wages and profits, divided by number of employees, as a proxy for productivity. The interviewees found it difficult to define productivity *per se*. This insight should be taken forward in any further surveys.

The COVID-19 pandemic makes it difficult to draw conclusions about response rates from the pilot survey. A number of points can however be made about optimising the use of the FAME database.

It is the only large-scale, easily accessible database that provides directors' email addresses for a web-based survey, combined with accounts data that permit the derivation of proxy value-added-per-head productivity measures. However, the contacts are often not reported and, for small firms, limited disclosure requirements often mean that data on profits and wages are also missing. In future work, careful attention would need to be paid to any potential selection biases to which lack of contacts might give rise. Wages and profits, and even employment data will, in many cases, have to be collected in the survey instrument itself.

Second, there are important time lags between the end year dates in the accounts, the date of the deposition of those accounts in Companies House, and their subsequent inclusion in the FAME database. Researchers using them must, as far as possible, avoid further lags and the consequent use of potentially outdated addresses. We found that checks against commercial email address contact list companies (Hunter io, Norbert), based on public domain website information, to be very useful, and these should be used to check, verify and augment the FAME lists.

Finally, great care has to be taken in ensuring that GDPR regulations are satisfied in relation to the collection and use of personal contact information in the survey process. Moreover, response rates may be expected to be low because of the widespread use of spam filters. The more personalised the sender's address is and the more prompts that can be used, the better. The latter likely persuades the recipient that an emailed request is not spam.

5.3 Limitations

The previous section has set out the various difficulties that we faced in achieving anything like an acceptable response rate, and the consequent need to conduct multiple rounds of the survey. While these difficulties provided valuable insights into how a future full-scale survey might best be conducted, they also delayed progress to the extent that our work then ran into the period affected by the COVID-19 pandemic. This most likely further undermined response rate, although we tried to adapt our survey instrument to make it topical to potential respondents. (The delay was further compounded by both investigators being indisposed from time to time during the project period.)

We have reported the results we have from both the qualitative and survey facets of our research. Both show some interesting insights. But we do not consider that either are sufficiently substantial to provide the basis for the high quality publications that we had hoped to produce.

5.4 Further work

There is clearly scope to conduct further research to understand the relationship between the KPIs that owner-directors of small firms use to direct their businesses, and productivity outcomes. Both parts of our research show that productivity is not used as a measure very much at all. One response to this might be to attempt to build the measurement of productivity into the routines of owner-managers. This, however, begs the question of whether they would act on indications of shortcomings in productivity if they are, for whatever variety of reasons, more motivated by other outcomes such as growth or profit. A second approach would be to explore further which of the KPIS that are widely used are most often associated with better productivity. The third approach is to focus on management practices, and let improved productivity emerge as a consequence. Of course, the insight from our research here is that management practices should be appropriate to the size of the firm. An interesting avenue for further research here would be to explore, in smaller firms, where elaborate and formalised systems of management practices are seen as burdensome and/or irrelevant, which one or two simple practices might make the biggest impact on productivity.

Methodologically, we have indicated in some detail the challenges associated with conducting survey-based research in this area. On the positive side, surveys conducted on small firms are much more likely than those conducted on large corporations to receive responses from well-informed individuals who have access to good quality, relevant data (cf Kull et al., 2018). This was evident in the quality of data provided in those responses we did receive. However, for the various reasons we discuss, achieving an acceptable response rate is extremely difficult, even without the intervention of a pandemic, especially if the request comes from an organisation (e.g. a university) other than a statutory body such as the ONS. It may well be the case that research resources are more profitably used in conducting a relatively large number of interviews, of a somewhat more closely structured and closed nature than our interviews. Indeed, such an approach was used in the original World Management Survey studies (Bloom and Van Reenen, 2007).

The study also gives an indication of what might be achieved by examining productivity-related themes using multidisciplinary and multi-method approaches. In this instance, we have fruitfully combined qualitative, interview-based research with a survey, and drawn on perspectives from small business management and economics, operations management, organisation studies and HR/industrial relations. This takes time – the two investigators here have been working together for several years in order to arrive at some degree of common understanding – but we feel such approaches have more potential for generating insights than ever-deeper, but narrow, mono-disciplinary analyses. Changing the tone of the debate, as PIN has set out to do, requires investment in the capabilities required to learn new languages, or at least new dialects.

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Appendices

Appendix 1 Survey Instruments

Confidential

Management and Business Performance in Small and Medium Sized Enterprises

Please read the following FAQ carefully before deciding to begin the survey.

Will your data be identifiable? We will separate data that can identify you and/or your firm from the responses you provide, so that, when analysis is subsequently carried out, the data are anonymised.

How will the survey response data be stored? Your data will be stored in encrypted files (that is no-one other than the researchers will be able to access them) and on password-protected computers. We will store hard copies of any data securely in locked cabinets in our offices. We will keep data that can identify you and your business separately from the survey responses (e.g. your responses on a specific topic). In accordance with University guidelines, we will keep the data securely for a minimum of ten years. For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage: www.lancaster.ac.uk/research/data-protection

In keeping with the conditions of Economic and Social Research Council funding rules, an anonymized copy of the data will be submitted to the UK Data Archive https://www.data-archive.ac.uk/. If they accept the dataset, it will then be available for other researchers to analyse.

How long will the survey take to complete? We anticipate that it will take 20 minutes for you to complete the survey.

Thank you for taking the time to read our covering letter and these FAQ questions and responses. If having read them you do not wish to take part and wish to be removed from the survey sampling frame, then please email us at businesssurvey@lancaster.ac.uk with the words 'Please remove me from the survey' in the subject field.

If having read the FAQ and our covering letter you do wish to take part then please proceed to answer the survey questions below. You may stop and save your answers at any stage. If having completed the survey you change your mind and wish to withdraw your survey return, then please just email us at businesssurvey@lancaster.ac.uk within ten working days of you submitting your responses with the words 'Please delete my survey data' in the subject field.

THE SURVEY

Please note when completing the survey that wherever the title Chief Executive Officer (CEO) is used in a question it should be interpreted to mean the most senior executive officer even if a different title is used for that role in your business (e.g managing director, senior partner etc).

Section A

In this section, we would like you to provide us with some general information about yourself and your business including your motivation in running the business and your strategy and planning processes.

A1. What is your job title in this business? position	◯ Chief Executive Officer (CEO) ◯ Managing Director (MD) ◯ Other
Please specify your position in this business.	position_other
A2. In what year did your business begin trading?	year

A3. From a personal point of view, how important have the following been to you in your involvement in the business?

Please tick the appropriate box in each row.

	Not at all	Slight	Moderate	Significant	Crucial	
Increase the current and future value of the business	○	○	○	○	○	businv01
Increase personal or family wealth	○	○	○	○	○	businv02
Learn and grow personally through the business	○	○	○	○	○	businv03
Contribute to the wellbeing of your stakeholders	○	○	○	○	○	businv04
Create something new and distinctive	○	○	○	○	○	businv05
Create a lasting legacy of your achievements	○	○	○	○	○	businv06
Build a business to pass on within the family in future	○	○	○	○	○	businv07
Build a business to generate wealth through sale to non-family members	○	○	○	○	○	businv08
Freedom to set and pursue your own objectives	○	○	○	○	○	businv09
Other factors (Please leave this row blank if there is no other factors)	○	○	○	○	○	businv10

Please specify the other factors if there is any businv10_1

A5. Please answer each of these questions about your firm's Chief Executive Officer (CEO):

1 Is the CEO a founder of the business? cefounder

◯ Yes ◯ No

Is the CEO a descendant or relative of the founder(s)?

◯ Yes ◯ No cerel

How many of the founding family members work in the business on a daily basis (including you if relevant)?

famwk

2 CEO Years with the business? ceyearsbus

3 Years as CEO? ceyearsce

4 Age? ceage

5 Gender? ◯ Male ◯ Female cegen

6 Number of businesses founded to date by the CEO (including this one if founded by the CEO)?

cebusfounded

7 Which of the following most closely describes the CEO's involvement in decision making? Please tick one box. invdec

◯ Personal control of strategic and operating decisions
◯ Personal control of strategic decisions, but delegation of operating decisions to senior management
◯ Key member of a group of senior managers that takes strategic decisions, to be implemented by the senior managers
◯ Other (Please specify)

Other (Please specify) invdec_4

8 Prior to joining this business, did the CEO have experience of working in a larger organisation with established formal planning and management structures? ceexp

◯ Yes ◯ No

9 If the CEO at very short notice was unable to fulfill her/his responsibilities in the business, which of the following most closely describes how the business would cope in the short-medium term? ceunable

◯ Many basic activities would stop or be problematic, as staff depend on the CEO for technical expertise and to make routine operational and business decisions
◯ Basic activities would continue uninterrupted, but the business would find it difficult to cope with anything out of the ordinary
◯ Basic activities and non-routine decisions and tasks would continue unhindered, as other staff and managers have the skills and discretion to make technical and business decisions
◯ None of the above closely describes how the business would cope in the short-medium term

	A6. Please answer these questions about the current Board of Directors (Including the CEO) of your business.	
1	Total number of Directors	totdir
2	Percentage of ordinary shares owned	dirshares

A7. Please answer the following questions regarding the ownership of your business.

1 Do you envisage a significant change of ownership in (or control of) your business in the next five years?

◯ Yes ◯ No ownch

(1) How soon do you expect this change to take place? Please tick one box.

chyear

◯ Within 3 years ◯ 4 to 5 years

(2) What kind of ownership (or control) change do you envisage? Please tick as many as are applicable.

chkind

☐ Succession/transfer within the family
☐ Sale to another company
☐ Sale to non-family internal managers
☐ Closure
☐ Public offering of shares on a stock market
☐ Other (Please specify)

Other (Please specify) chkind_6

Section B
In this section, we would like you to tell us about the market performance of your business.

B1 How many firms do you regard as serious competitors?

comps1

Of your serious competitors, how many are larger than your firm?

comps2

Of your serious competitors, how many are overseas firms?

comps3

B2 What percentage of your sales last year was accounted for by your largest customer?

lgst

B3 Is your firm's largest market: Please tick one box.

- ◯ Local
- ◯ Regional
- ◯ National
- ◯ International

market

B4 Which of the following do you feel describes your growth objectives over the NEXT 3 years? Please tick one box.

- ◯ Become smaller
- ◯ Stay same size
- ◯ Grow moderately
- ◯ Grow substantially

growth0

B5 Which of the following do you feel describes your growth objectives over the PAST three 3 years or since the company started trading, if that was less than three years ago? Please tick one box.

- ◯ Become smaller
- ◯ Stay same size
- ◯ Grow moderately
- ◯ Grow substantially

growth1

B6 With reference to your growth objective, over the past three years did you experience

- ◯ Growth as planned
- ◯ Growth more than planned
- ◯ Grow less than planned

growth2

B6 With reference to your growth objective, over the past three years did you experience

- ◯ Contract as planned
- ◯ Contract more than planned
- ◯ Contract less than planned

growth3

With reference to your growth objective, over the past three years did you experience

growth4

- ◯ Stay the same size
- ◯ Grow smaller
- ◯ Grow bigger

B7 Which of the following statements most closely describes the process used to provide goods or services for your customers? Please tick one box

process0

- ◯ Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer
- ◯ There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs
- ◯ Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything
- ◯ None of the above statements closely describes the process used to provide goods or services to my customers

B8 Which of the following most closely describes the way tasks are organised in your company?

organise0

- ◯ The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence
- ◯ The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks
- ◯ Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication
- ◯ None of the above statements closely describes the way tasks are organised in my company

B9. Please indicate the importance of the following indicators of performance of your business as a whole.

Please tick the appropriate box in each row.

	Do not use it	Moderately High	High	Very High	
Level of Profits	○	○	○	○	performind01
Growth of Profits	○	○	○	○	performind02
Profit Margin on Sales/Turnover	○	○	○	○	performind03
Profitability (Return on Assets)	○	○	○	○	performind04
Level of Sales/Turnover	○	○	○	○	performind05
Growth of Sales/Turnover	○	○	○	○	performind06
Level of Employment	○	○	○	○	performind07
Growth in Employment	○	○	○	○	performind08
Turnover per Employee	○	○	○	○	performind09
Profits per Employee	○	○	○	○	performind10
Wages plus Profits per Employee	○	○	○	○	performind11
Level of Share Price	○	○	○	○	performind12
Growth in Share Price	○	○	○	○	performind13
Other indicator (Please leave this row blank if there is no other Indicators)	○	○	○	○	performind14

Please specify the other indicator performind14_0

B10. How important are each of the following as sources of competitive advantage for your business?

	Not at all	Moderately	Significantly	Crucially
Price of Products/Services	○	○	○	○ comadv1
Cost of Products/Services	○	○	○	○ comadv2
Quality of Products/Service	○	○	○	○ comadv3
Design of Product /Services	○	○	○	○ comadv4
Flair and Creativity in Meeting Customer Needs	○	○	○	○ comadv5
Personal Attention to Customer Needs	○	○	○	○ comadv6
Speed of Response to Customer Needs	○	○	○	○ comadv7
Marketing and Sales Expertise	○	○	○	○ comadv8
Other factors (Please leave this row blank if there is no other factors)	○	○	○	○ comadv9

Please specify the other factor comadv9_1

B10. How important are each of the following as sources of competitive advantage for your business?

	Not at all	Moderately	Significantly	Crucially
Price of Products/Services	○	○	○	○ comadv1
Cost of Products/Services	○	○	○	○ comadv2
Quality of Products/Service	○	○	○	○ comadv3
Design of Product /Services	○	○	○	○ comadv4
Flair and Creativity in Meeting Customer Needs	○	○	○	○ comadv5
Personal Attention to Customer Needs	○	○	○	○ comadv6
Speed of Response to Customer Needs	○	○	○	○ comadv7
Marketing and Sales Expertise	○	○	○	○ comadv8
Other factors (Please leave this row blank if there is no other factors)	○	○	○	○ comadv9

Please specify the other factor comadv9_1

Section C

In this section we would like you to tell us about the practices you use in the management of your business.

C1. Does your firm use the following management practices in relation to any of your staff?

	Yes	No	
Formal performance target-setting with staff	○	○	mngprac1
Regular one-to-one performance reviews with staff	○	○	mngprac2
Performance-related pay (individual or group)	○	○	mngprac3
When appropriate - structured disciplinary processes to address performance shortcomings	○	○	mngprac4
When appropriate- structured training and development to address performance shortcomings	○	○	mngprac5
Pro-active career development	○	○	mngprac6
Off-the-job training (excluding health and safety)	○	○	mngprac7
Teamworking, where team members jointly decide how work is to be done	○	○	mngprac8
Regular briefings to staff on company performance and prospects	○	○	mngprac9

C2. You answered that you use the following practices. When did you introduce them?			
	less than 3 years ago	3-6 years ago	Over 6 years ago
Formal performance target-setting with staff	○	○	○ pracintro1
Regular one-to-one performance reviews with staff	○	○	○ pracintro2
Performance-related pay (individual or group)	○	○	○ pracintro3
When appropriate - structured disciplinary processes to address performance shortcomings	○	○	○ pracintro4
When appropriate - structured training and development to address performance shortcomings	○	○	○ pracintro5
Pro-active career development	○	○	○ pracintro6
Off-the-job training (excluding health and safety)	○	○	○ pracintro7
Teamworking, where team members jointly decide how work is to be done	○	○	○ pracintro8
Regular briefings to staff on company performance and prospects	○	○	○ pracintro9

C3. You answered that you use the following practices. Can you please indicate what proportion of your staff are covered by these practices?

	All	Not all but over 50%	50% or less
Formal performance target-setting with staff	○	○	○ staffprop1
Regular one-to-one performance reviews with staff	○	○	○ staffprop2
Performance-related pay (individual or group)	○	○	○ staffprop3
When appropriate - structured disciplinary processes to address performance shortcomings	○	○	○ staffprop4
When appropriate - structured training and development to address performance shortcomings	○	○	○ staffprop5
Pro-active career development	○	○	○ staffprop6
Off-the-job training (excluding health and safety)	○	○	○ staffprop7
Teamworking, where team members jointly decide how work is to be done	○	○	○ staffprop8
Regular briefings to staff on company performance and prospects	○	○	○ staffprop9

C4. You answered that you do not use the following practices. Why not? Please tick as many answers as are relevant in each row.

	Not appropriate for a business of our size	Insufficient Management Time/Resources	Limited expected benefit	None of those reasons
Formal performance target-setting with staff	☐	☐	☐	whynotprac1 ☐
Regular one-to-one performance reviews with staff	☐	☐	☐	whynotprac2 ☐
Performance-related pay (individual or group)	☐	☐	☐	whynotprac3 ☐
When appropriate - structured disciplinary processes to address performance shortcomings	☐	☐	☐	whynotprac4 ☐
When appropriate - training and development to address performance shortcomings	☐	☐	☐	whynotprac5 ☐
Pro-active career development	☐	☐	☐	whynotprac6 ☐
Off-the-job training (excluding health and safety)	☐	☐	☐	whynotprac7 ☐
Teamworking, where team members jointly decide how work is to be done	☐	☐	☐	whynotprac8 ☐
Regular briefings to staff on company performance and prospects	☐	☐	☐	whynotprac9 ☐

C5. Given your firm's history in the last 3 years, which of the following factors have had a significant positive or negative effect on your ability to meet your business objectives?

Please tick the appropriate box in each row ranging from 1 (a significantly negative effect) to 5 (a significantly positive effect).

	Very Significant Negative Effect	Moderately Significant Negative Effect	Neither Significant Negative or Positive Effect	Moderately Significant Positive Effect	Very Significant Positive Effect
Availability and cost of finance for expansion	○	○	○	○	○ factor01
Availability and cost of overdraft finance	○	○	○	○	○ factor02
Access to Skilled labour	○	○	○	○	○ factor03
Management skills	○	○	○	○	○ factor04
Effectiveness of your firm's management practices	○	○	○	○	○ factor05
Marketing and sales skills	○	○	○	○	○ factor06
Acquisition of technology	○	○	○	○	○ factor07
Ability to implement new technology	○	○	○	○	○ factor08
Availability of appropriate premises or site	○	○	○	○	○ factor09
Access to overseas markets	○	○	○	○	○ factor10
Growth of demand in principal product markets	○	○	○	○	○ factor11
Changing intensity of competition in principal product markets	○	○	○	○	○ factor12

Section D
In this section we would like you to tell us something about the nature of your workforce.

D1. What numbers of your workforce (including working directors) are currently employed in the occupation groups listed below?

Please enter the number 0 wherever you have no employee in that occupation group.

1	Managerial (Full Time)	fullmng
2	Managerial (Part Time)	partmng
3	Technological and scientific higher professionals (Full Time)	fulltech
4	Technological and scientific higher professionals (Part Time)	parttech
5	Legal, accounting and other higher professionals (Full Time)	fullleg
6	Legal, accounting and other higher professionals (Part Time)	partleg
7	All other employees (Full Time)	fullother
8	All other employees (Part Time)	partother

	D2. Over the last three years, how many employees, taking part-time and full-time together, in each occupation group have LEFT your firm? **Please enter number 0 wherever no employees left in that occupation group.**	
1	Managerial	leftmng
2	Technological and scientific higher professionals	lefttech
3	Legal, accounting and other higher professionals	leftleg
4	All other employees	leftother

position

	D3. Over the last three years, how many employees, taking part-time and full-time together, in each occupation group have JOINED your firm? **Please enter number 0 wherever no employee joined in that occupation group.**	
1	Managerial	joinmng
2	Technological and scientific higher professionals	jointech
3	Legal, accounting and other higher professionals	joinleg
4	All other employees	joinother

Appendix 2 Covid19

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Management and Business Performance in Small and Medium Sized Enterprises: Effects of the Coronavirus Outbreak

Please read the following FAQ carefully before deciding to begin the survey.

Will your data be identifiable? We will separate data that can identify you and/or your firm from the responses you provide, so that, when analysis is subsequently carried out, the data are anonymised.

How will the survey response data be stored? Your data will be stored in encrypted files (that is no-one other than the researchers will be able to access them) and on password-protected computers. We will store hard copies of any data securely in locked cabinets in our offices. We will keep data that can identify you and your business separately from the survey responses (e.g. your responses on a specific topic). In accordance with University guidelines, we will keep the data securely for a minimum of ten years. For further information about how Lancaster University processes personal data for research purposes and your data rights please visit our webpage: www.lancaster.ac.uk/research/data-protection

In keeping with the conditions of Economic and Social Research Council funding rules, an anonymized copy of the data will be submitted to the UK Data Archive https://www.data-archive.ac.uk/. If they accept the dataset, it will then be available for other researchers to analyse.

How long will the survey take to complete? We anticipate that it will take 20 minutes for you to complete the survey.

Thank you for taking the time to read our covering letter and these FAQ questions and responses. If having read them you do not wish to take part and wish to be removed from the survey sampling frame, then please email us at businesssurvey@lancaster.ac.uk with the words 'Please remove me from the survey' in the subject field.

If having read the FAQ and our covering letter you do wish to take part then please proceed to answer the survey questions below. You may stop and save your answers at any stage. If having completed the survey you change your mind and wish to withdraw your survey return, then please just email us at businesssurvey@lancaster.ac.uk within ten working days of you submitting your responses with the words 'Please delete my survey data' in the subject field.

THE SURVEY

Please note when completing the survey that wherever the title Chief Executive Officer (CEO) is used in a question it should be interpreted to mean the most senior executive officer even if a different title is used for that role in your business (e.g managing director, senior partner etc).

Section A

In this section, we would like you to provide us with some general information about yourself and your business and the impact of the Coronavirus outbreak

A1. What is your job title in this business?

position

- ◯ Chief Executive Officer (CEO)
- ◯ Managing Director (MD)
- ◯ Other

Please specify your position in this business. position_other

A2. In what year did your business begin trading? year

A3. What is the current trading status of your business?

tradingstatus

- ◯ Continuing to trade
- ◯ Has permanently ceased trading
- ◯ Has temporarily closed or temporarily paused trading

A4. Compared to the period April and May 2019, in what way was the turnover of your business different during April and May 2020?

turnoverchange

- ◯ Turnover Decreased by more than 50%
- ◯ Turnover Decreased between 20% and 50%
- ◯ Turnover Decreased by up to 20%
- ◯ Turnover Affected but within normal range
- ◯ Turnover Increased by up to 20%
- ◯ Turnover Increased between 20% and 50%
- ◯ Turnover Increased by more than 50%
- ◯ Not Sure

A5. What do you think were the main causes for the turnover of your business being outside its normal range during April and May 2020?

cause

- ◯ Coronavirus
- ◯ Other

A6. How confident are you that your enterprise has the financial resources to continue operating until end December 2020?

finanresource

- ◯ Confident
- ◯ Not confident
- ◯ Not sure

A7. Has your business applied for support under any of the following initiatives? Tick where appropriate

supportapply

- ☐ Coronavirus Job Retention Scheme
- ☐ Business rates holiday
- ☐ Deferring VAT payments
- ☐ HMRC Time To Pay scheme
- ☐ Small Business Coronavirus Cash Grant (SBCCG)
- ☐ Coronavirus Business Interruption Loan Scheme (CBILS)
- ☐ Coronavirus Bounce Back Loan Scheme (CBBLS)
- ☐ Local Authority Discretionary Grant Fund (SBGF)
- ☐ Retail Hospitality and Leisure Grant Fund (RHLGF)
- ☐ Coronavirus Futures Fund (CFF)
- ☐ We have not applied for any of these initiatives

A8. Of the support applied for, which has your business received?
Please tick appropriate box in each row

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	Yes	No
Coronavirus Job Retention Scheme	○	supportrecieve1
Business rates holiday	○	supportrecieve2
Deferring VAT payments	○	supportrecieve3
HMRC Time To Pay scheme	○	supportrecieve4
Small Business Coronavirus Cash Grant (SBCCG)	○	supportrecieve5
Coronavirus Business Interruption Loan Scheme (CBILS)	○	supportrecieve6
Coronavirus Bounce Back Loan Scheme (CBBLS)	○	supportrecieve7
Local Authority Discretionary Grant Fund (SBGF)	○	supportrecieve8
Retail Hospitality and Leisure Grant Fund (RHLGF)	○	supportrecieve9
Coronavirus Futures Fund (CFF)	○	supportrecieve10

Section B

In this section we would like you to tell us about the practices you were using in the normal management of your business, and their significance during the Coronavirus outbreak.

B1. In the two-year period leading up to the Coronavirus outbreak, did your business use the following management practices in relation to any of your staff?
Please tick appropriate box in each row

	Yes	No
Formal performance target-setting with staff	○	mngprac1
Regular one-to-one performance reviews with staff	○	mngprac2
Performance-related pay (individual or group)	○	mngprac3
When appropriate - structured disciplinary processes to address performance shortcomings	○	mngprac4
When appropriate- structured training and development to address performance shortcomings	○	mngprac5
Pro-active career development	○	mngprac6
Off-the-job training (excluding health and safety)	○	mngprac7
Teamworking, where team members jointly decide how work is to be done	○	mngprac8
Regular briefings to staff on company performance and prospects	○	mngprac9

B2. You answered that you used the following practices in the two-year period leading up to the Coronavirus outbreak. How helpful were these to you in managing the impact on your business of the Coronavirus outbreak?
Please tick appropriate box in each row

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	Not helpful	Of little help	Of some help	Very helpful
Formal performance target-setting with staff	○	○	○	○ pracchelp1
Regular one-to-one performance reviews with staff	○	○	○	○ pracchelp2
Performance-related pay (individual or group)	○	○	○	○ pracchelp3
When appropriate - structured disciplinary processes to address performance shortcomings	○	○	○	○ pracchelp4
When appropriate - structured training and development to address performance shortcomings	○	○	○	○ pracchelp5
Pro-active career development	○	○	○	○ pracchelp6
Off-the-job training (excluding health and safety)	○	○	○	○ pracchelp7
Teamworking, where team members jointly decide how work is to be done	○	○	○	○ pracchelp8
Regular briefings to staff on company performance and prospects	○	○	○	○ pracchelp9

B3. Which of the following measures has your business taken to cope with the impact of the Coronavirus outbreak on your workforce?
Please tick as many rows as apply.

workforceact

- ☐ Increased working hours
- ☐ Decreased working hours
- ☐ Laid off staff in short term
- ☐ Recruited staff for the short term
- ☐ Placed staff on furlough under the Coronavirus Job Retention Scheme
- ☐ Laid off staff permanently
- ☐ Recruited staff for the long term
- ☐ No measures taken

We noticed that you ticked both the first and second measures. However, the two options are mutually exclusive. Please double check you select the correct one.

B4. In the last two weeks, roughly what percentage of your business's workforce was doing each of the following

Working at their normal place of work

trade_workforceprop1

(in %)

Working remotely instead of at their normal place of work

trade_workforceprop2

(in %)

Furloughed

trade_workforceprop3

(in %)

B3. At the time of temporary closure or pause in trade, roughly what percentage of your business's workforce was

Working at their normal place of work

temclose_workforceprop1

(in %)

Working remotely instead of at their normal place of work

temclose_workforceprop2

(in %)

Furloughed

temclose_workforceprop3

(in %)

B3. At the time of closure, roughly what percentage of your business's workforce was doing each of the following:

Working at their normal place of work

close_workforceprop1

(in %)

Working remotely instead of at their normal place of work

close_workforceprop2

(in %)

Furloughed

close_workforceprop3

(in %)

B5. Has the productivity of staff working remotely instead of at their normal place of work been

◯ The same as when working at their normal place of work
◯ Lower than when working at their normal place of work
◯ Higher than when working at their normal place of work

trade_remoteprv

B6. In a post-coronavirus environment do you expect that the proportion of staff working remotely instead of at their normal place of work will, compared to the pre-coronavirus period, be

◯ Higher
◯ Lower
◯ About the same

trade_remoteexp

B4. Has the productivity of staff working remotely instead of at their normal place of work been

- ◯ The same as when working at their normal place of work
- ◯ Lower than when working at their normal place of work
- ◯ Higher than when working at their normal place of work

temclose_remoteprv

B5. In a post-coronavirus environment when you resume trading do you expect that the proportion of staff working remotely instead of at their normal place of work will, compared to the pre-coronavirus period, be

- ◯ Higher
- ◯ Lower
- ◯ About the same

temclose_remoteexp

Section C

In this section, we would like you to focus on the period prior to the Coronavirus outbreak so that you can tell us about your personal and business objectives, strategy, organisation and staff numbers in more normal times.

C1. From a personal point of view, how important were the following to you in your involvement in the business? Please tick the appropriate box in each row.

	Not Used	Slightly Important	Important	Highly Important
Increase the current and future value of the business	○	○	○	○ businv01
Increase personal or family wealth	○	○	○	○ businv02
Learn and grow personally through the business	○	○	○	○ businv03
Contribute to the wellbeing of your stakeholders	○	○	○	○ businv04
Create something new and distinctive	○	○	○	○ businv05
Create a lasting legacy of your achievements	○	○	○	○ businv06
Build a business to pass on within the family in future	○	○	○	○ businv07
Build a business to generate wealth through sale to non-family members	○	○	○	○ businv08
Freedom to set and pursue your own objectives	○	○	○	○ businv09
Other factors (Please leave this row blank if there are no other factors)	○	○	○	○ businv10

Please specify the other factors if there are any businv10_1

C2. Thinking about your normal business strategy process prior to the coronavirus outbreak, please tick appropriate box in each row

	Yes	No
Did your firm have monthly management accounts?	○	○ strategy1
Was your firm accredited as an Investor in People?	○	○ strategy2
Did your business have a formal strategic plan, which sets out objectives and how they are to be achieved?	○	○ strategy3

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	Yes	No
C2(1). Were employment relations issues (employee development, employee job satisfaction or employee diversity) covered in the plan?	◯	◯ emrelation1
C2(2). Was an employment relations manager involved in preparing the plan?	◯	◯ emrelation2

C2(3). How often did you review progress against your formal strategic plan? revplan_freq

◯ Once a year ◯ Every six months ◯ Quarterly ◯ More frequently

	Yes	No
C2(4). Did your review(s) involve other Board Members?	◯	◯ revplan_bm
C2(5). Did your reviews involve other senior managers?	◯	◯ revplan_sm

C2(6)C2(6). How often did you review progress against your overall business objectives? revbusobj_freq

◯ Once a year ◯ Every six months ◯ Quarterly ◯ More frequently

	Yes	No
C2(7). Did your review(s) involve other Board Members?	◯	◯ revbusobj_bm
C2(8). Did your reviews involve other senior managers?	◯	◯ revbusobj_sm

C3. Which of the following statements most closely described the process used to provide goods or services for your customers? Please tick one box process0

◯ Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer
◯ There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs
◯ Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything
◯ None of the above statements closely describes the process used to provide goods or services to my customers

C4. Which of the following most closely described the way tasks were organised in your company? Please tick one box. organise0

◯ The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence
◯ The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks
◯ Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication
◯ None of the above statements closely describes the way tasks are organised in my company

Section D
In this section, again focussing on the pre-Coronavirus period, we would like you to tell us about the market performance of your business and your main performance measures.

D1. Pre-Coronavirus, how many firms did you regard as serious competitors?

comps1

D2. Of your serious competitors, how many were larger than your firm?

comps2

D3. Of your serious competitors, how many were overseas firms?

comps3

We noticed that the values you entered for the three questions above might not be correct. The number of competitors that are larger than your firm or are overseas firms should be less or equal to the number of competitors you have in total. Please double check your answers. Thank you.

D4. What percentage of your sales in 2019-20 was accounted for by your largest customer?

lgst

D5. Pre-Coronavirus, was your firm's largest market: Please tick one box.

- ◯ Within 10 miles
- ◯ Within 11-50 miles
- ◯ Over 50 miles but within UK
- ◯ International

market

D6. Considering the two years leading up to the Coronavirus outbreak, please indicate the importance you attached to the following indicators of performance of your business as a whole.
Please tick the appropriate box in each row.

	Not Used	Slightly Important	Important	Highly Important	
Level of Profits	◯	◯	◯	◯	performind01
Profit Margin on Sales/Turnover	◯	◯	◯	◯	performind02
Profitability (Return on Assets)	◯	◯	◯	◯	performind03
Growth of Sales/Turnover	◯	◯	◯	◯	performind04
Turnover per Employee	◯	◯	◯	◯	performind05
Profits per Employee	◯	◯	◯	◯	performind06
Wages plus Profits per Employee	◯	◯	◯	◯	performind07
Other indicator (Please leave this row blank if there are no other Indicators)	◯	◯	◯	◯	performind08

Please specify the other indicator

performind08_0

D7. Considering the two years leading up to the Coronavirus outbreak, which of the following factors had a significant positive or negative effect on your ability to meet your business objectives?

Please tick the appropriate box in each row ranging from a very significant negative effect to a very significant positive effect.

	Very Significant Negative Effect	Moderately Significant Negative Effect	Neither Significant Negative or Positive Effect	Moderately Significant Positive Effect	Very Significant Positive Effect
Availability and cost of finance for expansion	○	○	○	○	factor01
Availability and cost of overdraft finance	○	○	○	○	factor02
Access to Skilled labour	○	○	○	○	factor03
Management skills	○	○	○	○	factor04
Effectiveness of your firm's management practices	○	○	○	○	factor05
Marketing and sales skills	○	○	○	○	factor06
Acquisition of technology	○	○	○	○	factor07
Ability to implement new technology	○	○	○	○	factor08
Availability of appropriate premises or site	○	○	○	○	factor09
Access to overseas markets	○	○	○	○	factor10
Growth of demand in principal product markets	○	○	○	○	factor11
Changing intensity of competition in principal product markets	○	○	○	○	factor12

Section E

We would like to conclude by asking you two open questions.

E1. Are there any other comments you wish to make concerning the management of your business during the Coronavirus outbreak?

covidmang

E2. Please provide any comments you wish to on how we might improve this survey questionnaire.

surveycom

Appendix 3 Summary Analysis of Survey Responses

Table A3.1 The Distribution of Sample Companies by Sector, Employment Size, Total Assets and Age

	Number of Companies	Percentage of Companies
All Companies	40	100
Manufacturing	21	52.5
Services	19	47.5
Employment <10	7	17.5
Employment 11<20	10	25
Employment 21<40	12	30
Employment >40	11	27.5
Total Assets < £1 m	15	37.5
Total Assets £1m < £4m	14	35
Total Assets >£4m	11	27.5
Age <20	13	32.5
Age 20<30	7	17.5
Age 30<40	9	22.5
Age =>40	11	27.5

Table A3.2 Sample Descriptive

		All Companies	Manufacturing Companies	Service Companies
Employment	Minimum	1.0	9.0	1.0
	Maximum	109.0	86.0	109.0
	Mean	32.7	31.3	34.3
	Median	25.0	25.0	21
	Standard Deviation	27.6	20.3	34.5
Total Assets £m	Minimum	<0.1	0.4	<0.1
	Maximum	8.1	8.2	5.8
	Mean	**2.3**	**3.1***	**1.5***
	Median	1.5	2.4	1.1
	Standard Deviation	2.2	2.4	1.5
Age	Minimum	8.0	15.0	8.0
	Maximum	73.0	73.0	72.0
	Mean	**31.8**	**37.1****	**26.0****
	Median	**31.0**	**38.0****	**25.0****
	Standard Deviation	16.5	16.1	15.2

Mann Whitney Test (Table A3.2)			
	Z value	P-value	Exact P-value
Employment	0.542	0.5879	0.5964
Total Assets £m	1.93	0.0536	0.0538
Age	2.439	0.0147	0.0138

Median Test (Table A3.2)				
	chi2	P-value	chi2 Continuity corrected	P-value
Employment	0.0003	0.987	0.0907	0.763
Total Assets £m	1.6889	0.194	0.95	0.33
Age	4.9123	0.027	3.609	0.057

Table A3.3a The Use of Management Practices by Sector

The Use of Management Practices	All Companies		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Formal performance target-setting with staff	19	47.5	8	38.1	11	57.9
Regular one-to-one performance reviews with staff	30	75.0	14	66.7	16	84.2
Performance-related pay (individual or group)	19	47.5	10	47.6	9	47.4
Structured disciplinary processing to address staff underperformance	27	67.5	14	66.7	13	68.4
Structured training and development to address underperformance	30	75.0	16	76.2	14	73.7
Pro-active career development	26	65.0	14	66.7	12	63.2
Off-the-job training (excluding health and safety)	24	61.5	12	57.1	12	66.7
Teamworking, where team members jointly decide how work is to be done	27	67.5	15	71.4	12	63.2
Regular briefings to staff on company performance and prospects	33	82.5	18	85.7	15	79.0

Table A3.3b The Use of Management Practices by size groups

The Use of Management Practices	Employment <10		Employment 11<20		Employment 21<40		Employment >40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Formal performance target-setting with staff	2	28.6	4	40.0	8	66.7	5	45.5
Regular one-to-one performance reviews with staff	4	57.2	6	60.0	11	91.7	9	81.8
Performance-related pay (individual or group)	2	28.2	4	40.0	7	58.3	6	54.6
Structured disciplinary processing to address staff underperformance	3	42.9	7	70.0	7	58.3	10	90.9
Structured training and development to address underperformance	3	42.9	7	70.0	10	83.3	10	90.9
Pro-active career development	2	28.6	7	70.0	8	66.7	9	81.8
Off-the-job training (excluding health and safety)	2	33.3	7	70.0	9	75.0	6	54.5
Teamworking, where team members jointly decide how work is to be done	3	42.9	8	80.0	9	75.0	7	63.6
Regular briefings to staff on company performance and prospects	5	71.4	8	80.0	10	83.3	10	90.9

Table A3.3c The Use of Management Practices by age groups

The Use of Management Practices	Age <20		Age 20<30		Age 30<40		Age =>40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Formal performance target-setting with staff	6	46.15	4	57.14	4	44.44	5	45.45
Regular one-to-one performance reviews with staff	11	84.62	6	85.17	6	66.67	7	63.64
Performance-related pay (individual or group)	8	61.54	3	42.86	4	44.44	4	36.36
Structured disciplinary processing to address staff underperformance	10	76.92	5	71.43	6	66.67	6	54.55
Structured training and development to address underperformance	11	84.62	5	71.43	5	55.56	9	81.82
Pro-active career development	10	76.92	4	57.14	5	55.56	7	63.64
Off-the-job training (excluding health and safety)	9	69.23	6	85.71	2	22.22	7	70
Teamworking, where team members jointly decide how work is to be done	7	53.85	7	100	6	66.67	7	63.64
Regular briefings to staff on company performance and prospects	11	84.62	6	85.71	8	88.89	8	72.73

Two-sample Test of Proportions for the Use of Management Practices Between Manufacturing and Service Companies (Table A3.3a)		
	Z-value	P-value
Formal performance target-setting with staff	-1.2522	0.2105
Regular one-to-one performance reviews with staff	-1.2796	0.2007
Performance-related pay (individual or group)	0.0159	0.9874
Structured disciplinary processing to address staff underperformance	-0.1183	0.9058
Structured training and development to address underperformance	0.1828	0.855
Pro-active career development	0.2323	0.8163
Off-the-job training (excluding health and safety)	-0.6094	0.5422
Teamworking, where team members jointly decide how work is to be done	0.5577	0.577
Regular briefings to staff on company performance and prospects	0.5625	0.5738

Kruskal-Wallis Rank Test Across 4 Employment Groups (Table A3.3b)				
	chi2	P-value	chi2 adjusted for ties	P-value
Formal performance target-setting with staff	2.202	0.5315	2.942	0.4006
Regular one-to-one performance reviews with staff	2.437	0.4868	4.330	0.2280
Performance-related pay (individual or group)	1.471	0.6890	1.965	0.5798
Structured disciplinary processing to address staff underperformance	3.322	0.3446	5.044	0.1686
Structured training and development to address underperformance	3.249	0.3549	5.772	0.1233
Pro-active career development	3.712	0.2942	5.436	0.1425
Off-the-job training (excluding health and safety)	2.399	0.4938	3.376	0.3372
Teamworking, where team members jointly decide how work is to be done	1.947	0.5835	2.957	0.3983
Regular briefings to staff on company performance and prospects	0.500	0.9190	1.153	0.7644

Kruskal-Wallis Rank Test Across 4 Age Groups (Table A3.3c)				
	chi2	P-value	chi2 adjusted for ties	P-value
Formal performance target-setting with staff	0.235	0.9717	0.315	0.9573
Regular one-to-one performance reviews with staff	1.186	0.7565	2.106	0.5506
Performance-related pay (individual or group)	1.218	0.7487	1.627	0.6533
Structured disciplinary processing to address staff underperformance	0.912	0.8226	1.384	0.7092
Structured training and development to address underperformance	1.524	0.6769	2.707	0.4391
Pro-active career development	0.908	0.8234	1.330	0.7220
Off-the-job training (excluding health and safety)	**5.700**	**0.1271**	**8.023**	**0.0455****
Teamworking, where team members jointly decide how work is to be done	2.923	0.4036	4.439	0.2178
Regular briefings to staff on company performance and prospects	0.453	0.9290	1.046	0.7902

Table A3.4 The Number of Management Practices used by Companies

	Number of Companies	Minimum	Maximum	Mean	Median
All Companies	39	0	9	6.0	6
Manufacturing	21	2	9	5.8	6
Services	18	0	9	6.3	7
Employment <10	6	0	8	4.3	5
Employment 11<20	10	2	9	5.8	6
Employment 21<40	12	2	9	6.6	7
Employment >40	11	4	9	6.5	7
Age <20	13	4	9	6.4	7
Age 20<30	7	2	9	6.6	8
Age 30<40	9	0	8	5.1	6
Age =>40	11	0	9	5.5	6

Mann Whitney Test (Table A3.4)			
	Z value	P-value	Exact P-value
The Number of Management Practices	-1.253	0.2103	0.2149

Median Test (Table A3.4)				
	chi2	P-value	chi2 Continuity corrected	P-value
The Number of Management Practices	2.0551	0.152	1.2371	0.266

Kruskal-Wallis Rank Test Across 4 Employment Groups (Table A3.4)				
	chi2	P-value	chi2 adjusted for ties	P-value
The Number of Management Practices	3.054	0.3834	3.119	0.3736

Mann Whitney Test Across 2 Employment Groups (Table A3.4)			
	Z value	P-value	Exact P-value
The Number of Management Practices	-1.587	0.1125	0.1153

Median Test Across 2 Employment Groups (Table A3.4)				
	chi2	P-value	chi2 Continuity corrected	P-value
The Number of Management Practices	1.3666	0.242	0.7112	0.399

Kruskal-Wallis Rank Test Across 2 Employment Groups (Table A3.4)				
	chi2	P-value	chi2 adjusted for ties	P-value
The Number of Management Practices	2.466	0.1163	2.519	0.1125

Kruskal-Wallis Rank Test Across 4 Age Groups (Table A3.4)				
	chi2	P-value	chi2 adjusted for ties	P-value
The Number of Management Practices	1.877	0.5983	1.915	0.5903

Table A3.5 Important reasons for involvement in running the company

Table A3.5a Important reasons for involvement by Sector

Important reasons for involvement in running the company	All Companies		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Increase the current and future value of the business	33	82.5	17	80.95	16	84.21
Increase personal or family wealth	24	60	13	61.90	11	57.89
Learn and grow personally through the business	31	77.5	17	80.95	14	73.68
Contribute to the wellbeing of my stakeholders	31	77.5	15	71.43	16	84.21
Create something new and distinctive	21	52.5	11	52.38	10	52.63
Create a lasting legacy of my achievements	15	37.5	9	42.86	6	31.58
Build a business to pass on within the family in future	11	27.5	7	33.33	4	21.05
Build a business to generate wealth through sale to non-family members	10	25	4	19.05	6	31.58
Freedom to set and pursue my own objectives	34	85	15	71.43	19	100
Other factors	3	60	1	100	2	50

Table A3.5b Important reasons for involvement by Employment Size

Important reasons for involvement in running the company	Employment <10		Employment 11<20		Employment 21<40		Employment >40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Increase the current and future value of the business	6	85.71	7	70	10	83.33	10	90.91
Increase personal or family wealth	5	71.43	5	50	7	58.33	7	63.64
Learn and grow personally through the business	5	71.43	8	80	9	75	9	81.82
Contribute to the wellbeing of my stakeholders	5	71.43	7	70	10	83.33	9	81.82
Create something new and distinctive	1	14.29	7	70	8	66.67	5	45.45
Create a lasting legacy of my achievements	1	14.29	3	30	5	41.67	6	54.55
Build a business to pass on within the family in future	1	14.29	6	60	1	8.33	3	27.27
Build a business to generate wealth through sale to non-family members	2	28.57	2	20	3	25	3	27.27
Freedom to set and pursue my own objectives	7	100	7	70	10	83.33	10	90.91
Other factors	2	66.67	no obs.		1	50	no obs.	

Table A3.5c Important reasons for involvement by Age Groups

Important reasons for involvement in running the company	Age <20		Age 20<30		Age 30<40		Age =>40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Increase the current and future value of the business	13	100	4	57.14	7	77.78	9	81.82
Increase personal or family wealth	6	46.15	5	71.43	6	66.67	7	63.64
Learn and grow personally through the business	12	92.31	4	57.14	7	77.78	8	72.73
Contribute to the wellbeing of my stakeholders	10	76.92	4	57.14	8	88.89	9	81.82
Create something new and distinctive	9	69.23	4	57.14	4	44.44	4	36.36
Create a lasting legacy of my achievements	5	38.46	2	28.57	4	44.44	4	36.36
Build a business to pass on within the family in future	2	15.38	2	28.57	5	55.56	2	18.18
Build a business to generate wealth through sale to non-family members	5	38.46	1	14.29	2	22.22	2	18.18
Freedom to set and pursue my own objectives	12	92.31	6	85.71	8	88.89	8	72.73
Other factors	no obs.		1	100	1	50	1	100

Two-sample Test of Sum of Percentages Important or Highly Important Between Manufacturing and Service Companies (Table A3.5a)		
	Z-value	P-value
Increase the current and future value of the business	-0.2708	0.7865
Increase personal or family wealth	0.2585	0.796
Learn and grow personally through the business	0.5497	0.5825
Contribute to the wellbeing of my stakeholders	-0.9667	0.3337
Create something new and distinctive	-0.0159	0.9874
Create a lasting legacy of my achievements	0.7358	0.4619
Build a business to pass on within the family in future	0.8686	0.385
Build a business to generate wealth through sale to non-family members	-0.914	0.3607
Freedom to set and pursue my own objectives	**-2.5272**	**0.0115****

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.5b)				
	chi2	P-value	chi2 adjusted for ties	P-value
Increase the current and future value of the business	0.709	0.8712	1.635	0.6515
Increase personal or family wealth	0.613	0.8935	0.850	0.8374
Learn and grow personally through the business	0.176	0.9814	0.336	0.9532
Contribute to the wellbeing of my stakeholders	0.420	0.9361	0.802	0.8490
Create something new and distinctive	**4.753**	**0.1908**	**6.349**	**0.0958***
Create a lasting legacy of my achievements	2.265	0.5192	3.219	0.3590
Build a business to pass on within the family in future	**4.740**	**0.1919**	**7.919**	**0.0477****
Build a business to generate wealth through sale to non-family members	0.116	0.9899	0.206	0.9766
Freedom to set and pursue my own objectives	1.242	0.7430	3.244	0.3555
Other factors	0.083	0.7728	0.111	0.7389

Two-sample Test of Sum of Percentages Important or Highly Important Between 2 Employment Size Group (Table A3.5b)		
	Z-value	P-value
Increase the current and future value of the business	-0.8628	0.3882
Increase personal or family wealth	-0.1306	0.8961
Learn and grow personally through the business	-0.134	0.8934
Contribute to the wellbeing of my stakeholders	-0.9	0.3681
Create something new and distinctive	-0.5925	0.5535
Create a lasting legacy of my achievements	-1.5691	0.1166
Build a business to pass on within the family in future	**1.6654**	**0.0958***
Build a business to generate wealth through sale to non-family members	-0.1847	0.8535
Freedom to set and pursue my own objectives	-0.4031	0.6869

Kruskal-Wallis Rank Test by 4 Age Groups (Table A3.5c)				
	chi2	P-value	chi2 adjusted for ties	P-value
Increase the current and future value of the business	2.543	0.4676	5.867	0.1183
Increase personal or family wealth	1.157	0.7634	1.606	0.6581
Learn and grow personally through the business	1.757	0.6244	3.356	0.3399
Contribute to the wellbeing of my stakeholders	1.252	0.7406	2.392	0.4952
Create something new and distinctive	2.118	0.5482	2.830	0.4186
Create a lasting legacy of my achievements	0.298	0.9604	0.424	0.9353
Build a business to pass on within the family in future	2.914	0.4051	4.868	0.1817
Build a business to generate wealth through sale to non-family members	1.095	0.7784	1.945	0.5839
Freedom to set and pursue my own objectives	0.729	0.8664	1.905	0.5924
Other factors	1.750	0.6259	2.333	0.5062

Table A3.6 Business Strategy Characteristics

	Number of Companies			Percentage of Companies		
	Having Monthly Management Accounts	Accredited as an Investor in People	Having a Formal Strategic Plan	Having Monthly Management Accounts	Accredited as an Investor in People	Having a Formal Strategic Plan
All Companies	32	1	22	80.0	2.6	55.0
Manufacturing	19*	0	11	90.5	0.0	52.4
Services	13*	1	11	68.4	5.6	57.9
Employment <10	3*	0	3	42.9	0.0	42.9
Employment 11<20	9*	0	5	90.0	0.0	50.0
Employment 21<40	11*	0	6	91.7	0.0	50.0
Employment >40	9*	1	8	81.8	9.1	72.7
Age <20	11	0	7	84.6	0.0	53.9
Age 20<30	5	0	3	71.4	0.0	42.9
Age 30<40	6	0	5	66.7	0.0	55.6
Age =>40	10	1	7	90.9	9.1	63.6

Two-sample Test of Proportions for the Use of Business Strategy Between Manufacturing and Service Companies (Table A3.6)		
	Z-value	P-value
Having Monthly Management Accounts	**1.7414**	**0.0816***
Accredited as an Investor in People	-1.0942	0.2738
Having a Formal Strategic Plan	-0.35	0.7263

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.6)				
	chi2	P-value	chi2 adjusted for ties	P-value
Having Monthly Management Accounts	**3.608**	**0.307**	**7.512**	**0.0573***
Accredited as an Investor in People	0.191	0.979	2.545	0.4671
Having a Formal Strategic Plan	1.475	0.6881	1.985	0.5755

Two-sample Test of Proportions for the Use of Business Strategy Between 2 Employment Groups(Table A3.6)		
	Z-value	P-value
Having Monthly Management Accounts	-1.2794	0.2008
Accredited as an Investor in People	-0.845	0.3981
Having a Formal Strategic Plan	-0.8679	0.3854

Kruskal-Wallis Rank Test by 4 Age Groups (Table A3.6)				
	chi2	P-value	chi2 adjusted for ties	P-value
Having Monthly Management Accounts	1.083	0.7812	2.255	0.5212
Accredited as an Investor in People	0.191	0.9790	2.545	0.4671
Having a Formal Strategic Plan	0.548	0.9082	0.738	0.8643

Table A3.7 Strategic Planning Processes

Table A3.7a Strategic Planning Processes by Sector

(All Companies with a Strategic Plan: Total ob.=22, Mfg =11, services=11)

Strategic Planning Processes	**All Companies with a Strategic Plan**		**Manufacturing Companies**		**Service Companies**	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Employment relations in the strategic plan	16	72.7	7	63.6	9	81.8
Employment relations manager involved in preparing the strategic plan	4	18.2	2	18.2	2	18.2
Other board members involved in strategic plan review	17	77.3	7	63.6	10	90.9
Other senior managers involved in strategic plan review	20	90.9	10	90.9	10	90.9
Frequency of strategic plan review -- Once a year	**4**	**18.2**	**4**	**36.4****	**0**	**0.0****
Frequency of strategic plan review -- Every Six Months	4	18.2	2	18.2	2	18.2
Frequency of strategic plan review -- Quarterly	11	50	4	36.4	7	63.6
Frequency of strategic plan review -- More Frequently	3	13.6	1	9.1	2	18.2

Table A3.7b Strategic Planning Processes by Employment Size

All Companies with a Strategic Plan: Total ob.=22, (Employment <10) =3, (Employment 11<20)=5; (Employment 21<40)=6; (Employment >40)=8

Strategic Planning Processes	**Employment <10**		**Employment 11<20**		**Employment 21<40**		**Employment >40**	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Employment relations in the strategic plan	2	66.6	4	80.0	3	50.0	7	87.5
Employment relations manager involved in preparing the strategic plan	0	0	1	20.0	0	0.0	3	37.5
Other board members involved in strategic plan review	**1**	**33.3***	**3**	**60.0***	**5**	**83.3***	**8**	**100.0***
Other senior managers involved in strategic plan review	2	66.7	5	100.0	6	100	7	87.5
Frequency of strategic plan review -- Once a year	0	0.0	2	40.0	0	0.0	2	25.0
Frequency of strategic plan review -- Every Six Months	1	33.3	1	20.0	1	16.7	1	12.5
Frequency of strategic plan review -- Quarterly	1	33.3	1	20.0	5	83.3	4	50.0
Frequency of strategic plan review -- More Frequently	1	33.3	1	20.0	0	0.0	1	12.5

Two-sample Test of Proportions for Strategic Planning Processes Between Manufacturing and Service Companies (Table A3.7a)		
	Z-value	P-value
Employment relations in the strategic plan	-0.9575	0.3384
Employment relations manager involved in preparing the strategic plan	0	1
Other board members involved in strategic plan review	-1.5262	0.1269
Other senior managers involved in strategic plan review	0	1
Frequency of strategic plan review -- Once a year	**2.2110**	**0.0270****
Frequency of strategic plan review -- Every Six Months	0	1
Frequency of strategic plan review -- Quarterly	-1.2792	0.2008
Frequency of strategic plan review -- More Frequently	-0.6213	0.5344

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.7b)				
	chi2	P-value	chi2 adjusted for ties	P-value
Employment relations in the strategic plan	1.498	0.6828	2.512	0.4731
Employment relations manager involved in preparing the strategic plan	1.715	0.6336	3.835	0.2798
Other board members involved in strategic plan review	**3.339**	**0.3422**	**6.325**	**0.0968***
Other senior managers involved in strategic plan review	0.793	0.8510	3.194	0.3627
Frequency of strategic plan review -- Once a year	1.643	0.6496	3.675	0.2988
Frequency of strategic plan review -- Every Six Months	0.280	0.9637	0.627	0.8902
Frequency of strategic plan review -- Quarterly	3.443	0.3282	4.582	0.2051
Frequency of strategic plan review -- More Frequently	0.715	0.8696	2.020	0.5682

Two-sample Test of Proportions for Strategic Planning Processes Between 2 Employment Groups (Table A3.7b)		
	Z-value	P-value
Employment relations in the strategic plan	0.1809	0.8564
Employment relations manager involved in preparing the strategic plan	-0.5223	0.6014
Other board members involved in strategic plan review	**-2.3075**	**0.0210****
Other senior managers involved in strategic plan review	-0.4205	0.6742
Frequency of strategic plan review -- Once a year	0.6268	0.5308
Frequency of strategic plan review -- Every Six Months	0.6268	0.5308
Frequency of strategic plan review -- Quarterly	**-1.7728**	**0.0763***
Frequency of strategic plan review -- More Frequently	1.1741	0.2404

Table A3.8 Business Objectives Processes for Companies without a Strategic Business Plan

Table A3.8a Business Objectives Processes for Companies without a Strategic Business Plan by Sector

All Companies without a Strategic Plan: Total ob.=18, Mfg =10, services=8

Business Objectives Processes	All Companies without a Strategic Plan		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Other board members involved in business objectives review	13	72.2	7	70	6	75
Other senior managers involve in business objectives review	**9**	**50.0**	**8**	**80***	**1**	**12.5***
Frequency of business objectives review -- Once a year	1	5.6	0	0	1	12.5
Frequency of business objectives review -- Every Six Months	1	5.6	0	0	1	12.5
Frequency of business objectives review -- Quarterly	11	61.1	7	70	4	50.0
Frequency of business objectives review -- More Frequently	5	27.8	3	30	2	25.0

Table A3.8b Business Objectives Processes for Companies without a Strategic Business Plan by Employment Group

All Companies without a Strategic Plan: Total ob.=18, (Employment <10) =4, (Employment 11<20)=5; (Employment 21<40)=6; (Employment >40)

Business Objectives Processes	**Employment <10**		**Employment 11<20**		**Employment 21<40**		**Employment >40**	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Other board members involved in business objectives review	**2**	**50.0***	**2**	**40***	**6**	**100***	**3**	**100***
Other senior managers involve in business objectives review	0	0.0	3	60	4	66.7	2	66.7
Frequency of business objectives review -- Once a year	1	25.0	0	0.0	0	0.0	0	0.0
Frequency of business objectives review -- Every Six Months	1	25.0	0	0.0	0	0.0	0	0.0
Frequency of business objectives review -- Quarterly	1	25.0	4	80.0	3	50.0	3	100
Frequency of business objectives review -- More Frequently	1	25.0	1	20.0	3	50.0	0	0.0

Two-sample Test of Proportions for Business Objectives Processes Between Manufacturing and Service Companies (Table A3.8a)		
	Z-value	P-value
Other board members involved in business objectives review	-0.2353	0.8139
Other senior managers involve in business objectives review	**2.846**	**0.0044****
Frequency of business objectives review -- Once a year	-1.1504	0.25
Frequency of business objectives review -- Every Six Months	-1.1504	0.25
Frequency of business objectives review -- Quarterly	0.8649	0.3871
Frequency of business objectives review -- More Frequently	0.2353	0.8139

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.8b)				
	chi2	P-value	chi2 adjusted for ties	P-value
Other board members involved in business objectives review	**4.011**	**0.2603**	**6.643**	**0.0842***
Other senior managers involve in business objectives review	3.695	0.2964	4.911	0.1784
Frequency of business objectives review -- Once a year	0.553	0.9072	3.500	0.3208
Frequency of business objectives review -- Every Six Months	0.553	0.9072	3.500	0.3208
Frequency of business objectives review -- Quarterly	3.489	0.3221	4.879	0.1809
Frequency of business objectives review -- More Frequently	1.595	0.6606	2.642	0.4503

Two-sample Test of Proportions for Business Objectives Processes: 2 Employment Groups (Table A3.8b)		
	Z-value	P-value
Other board members involved in business objectives review	**-2.6312**	**0.0085***
Other senior managers involve in business objectives review	-1.4142	0.1573
Frequency of business objectives review -- Once a year	1.029	0.3035
Frequency of business objectives review -- Every Six Months	1.029	0.3035
Frequency of business objectives review -- Quarterly	-0.4835	0.6287
Frequency of business objectives review -- More Frequently	-0.5262	0.5987

Kruskal-Wallis Rank Test by 4 Age Groups				
	chi2	P-value	chi2 adjusted for ties	P-value
Other board members involved in business objectives review	0.079	0.9942	0.131	0.9879
Other senior managers involve in business objectives review	0.000	1.000	0.000	1.000
Frequency of business objectives review -- Once a year	0.553	0.9072	3.500	0.3208
Frequency of business objectives review -- Every Six Months	0.553	0.9072	3.500	0.3208
Frequency of business objectives review -- Quarterly	2.684	0.4429	3.753	0.2894
Frequency of business objectives review -- More Frequently	0.789	0.8520	1.308	0.7273

Table A3.9a Business Process Models by Sector

Business Process Models	All Companies		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer	15	37.5	9	42.9	6	31.6
There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs	15	37.5	7	33.3	8	42.1
Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything	3	7.5	2	9.5	1	5.3
None of the above statements closely describes the process used to provide goods or services to my customers	7	17.5	3	14.3	4	21.1

Table A3.9b Business Process Models by Size

Business Process Models	Employment <10		Employment 11<20		Employment 21<40		Employment > 40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer	4	57.1	2	20.0	4	33.3	5	45.5
There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs	2	28.6	3	30.0	7	58.3	3	27.3
Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything	0	0.0	2	20.0	0	0.0	1	9.1
None of the above statements closely describes the process used to provide goods or services to my customers	1	14.3	3	30.0	1	8.3	2	18.2

Table A3.9c Business Process Models by Age

Business Process Models	Age <20		Age 20<30		Age 30<40		Age =>40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Every product/service is very different and we use skilled, flexible staff, with little automation, little standardization, and close interaction with the customer	4	30.8	3	42.9	0	0.0	8	72.7
There are similarities between products/services and we seek opportunities to standardize, automate, use less skilled staff and reduce customer involvement so as to reduce costs	4	30.8	2	28.6	6	66.7	3	27.3
Our products /services are very standardized and we use the same, highly automated process, with few staff and no customer involvement, to produce/deliver everything	2	15.8	0	0.0	1	11.1	0	0.0
None of the above statements closely describes the process used to provide goods or services to my customers	3	23.1	2	28.6	2	22.2	0	0.0

Table A3.10a Task Organisation by Sector

Type of Task Organisation	All Companies		Manufacturing Companies		Service Companies	
	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	13	32.5	7	33.33	6	31.58
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	17	42.5	9	42.86	8	42.11
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	7	17.5	4	19.05	3	15.79
None of the above statements closely describes the way tasks are organised in my company	3	7.5	1	4.76	2	10.53

Table A3.10b Task Organisation by Size

Type of Task Organisation	Employment <10		Employment 11<20		Employment 21<40		Employment >40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	1	14.29	5	50	3	25	4	36.36
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	1	14.29	3	30	7	58.33	6	54.55
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	3	42.86	2	20	1	8.33	1	9.09
None of the above statements closely describes the way tasks are organised in my company	2	28.57	0	0	1	8.33	0	0

Table A3.10c Task Organisation by Age

Type of Task Organisation	Age <20		Age 20<30		Age 30<40		Age =>40	
	No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	5	38.46	1	14.29	4	44.44	3	27.27
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	6	46.15	3	42.86	3	33.33	5	45.45
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	2	15.38	2	28.57	0	0	3	27.27
None of the above statements closely describes the way tasks are organised in my company	0	0	1	14.29	2	22.22	0	0

Two-sample Test of Proportions for Task Organisation Between Manufacturing and Service Companies (Table A3.10a)		
Type of Task Organisation	Z-value	P-value
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	0.1183	0.9058
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	0.0480	0.9617
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	0.2708	0.7865
None of the above statements closely describes the way tasks are organised in my company	-0.6912	0.4894

Kruskal-Wallis Rank Test by 4 Size Groups (Table A3.10b)				
Type of Task Organisation	chi2	P-value	chi2 adjusted for ties	P-value
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	1.822	0.6102	2.766	0.4291
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	3.436	0.3292	4.684	0.1965
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	1.858	0.6023	4.288	0.2320
None of the above statements closely describes the way tasks are organised in my company	1.258	0.7392	6.040	0.1097

Kruskal-Wallis Rank Test by 4 Age Groups Table A3.10c				
Type of Task Organisation	chi2	P-value	chi2 adjusted for ties	P-value
The specialist responsibility of each individual and group/department is clearly defined, and decisions, tasks and processes nearly always follow a clearly-defined sequence	1.279	0.7342	1.942	0.5846
The specialist responsibility of each individual and group/department is clearly defined, but it is often necessary to use informal methods or working groups to handle unusual tasks	0.301	0.9599	0.410	0.9382
Each individual has their own skill-set, but we decide who is going to do what from scratch, for each new task, and adapt that as the task unfolds, using informal communication	1.382	0.7097	3.190	0.3633
None of the above statements closely describes the way tasks are organised in my company	1.060	0.7866	5.092	0.1652

Table A3.11 Competitive Position

Table A3.11a Competitive Position By Sector

		All Companies	Manufacturing Companies	Service Companies
Number of serious competitors	Minimum	0	0	0
	Maximum	100	12	100
	Mean	8.923	5.65	12.368
	Median	5	5	5
	Standard Deviation	15.984	3.313	22.436
Number of serious competitors larger than my company	Minimum	0	0	0
	Maximum	100	9	100
	Mean	7.179	4.35	10.158
	Median	4	4.5	4
	Standard Deviation	16.008	2.498	22.719
Number of serious overseas competitors	Minimum	0	0	0
	Maximum	10	10	6
	Mean	1.846	2.6	1.053
	Median	0	2	0
	Standard Deviation	2.498	2.761	1.957
Percentage of sales to largest customer	Minimum	1	5	1
	Maximum	50	50	50
	Mean	19.769	19.2	20.368
	Median	15	15	20
	Standard Deviation	14.449	13.356	15.865

Table A3.11b Competitive Position By Employment Group

		Employment <10	Employment 11<20	Employment 21<40	Employment >40
Number of serious competitors	Minimum	0	0	2	0
	Maximum	100	10	12	10
	Mean	25.5	6	6.583	5.091
	Median	11.5	6	5	5
	Standard Deviation	38.49	3.682	3.528	2.844
Number of serious competitors larger than my company	Minimum	0	0	2	0
	Maximum	100	8	9	6
	Mean	23.833	4.3	4.667	3.455
	Median	6.5	5.5	5	4
	Standard Deviation	38.989	3.199	1.775	1.864
Number of serious overseas competitors	Minimum	0	0	0	0
	Maximum	3	6	10	6
	Mean	0.5	1.8	2.75	1.636
	Median	0	0.5	2	0
	Standard Deviation	1.225	2.3	3.079	2.378
Percentage of sales to largest customer	Minimum	3	5	3	1
	Maximum	30	28	40	50
	Mean	32.667	16.2	13.5	22.818
	Median	36.5	15	9	15
	Standard Deviation	17.002	7.51	11.082	17.116

Table A3.11c Largest Market By Sector

		All Companies		Manufacturing Companies		Service Companies	
		Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies	Number of Companies	Percentage of Companies
Largest Market	Within 10 miles	3	7.5	0	0	3	15.79
	Within 11-50 miles	3	7.5	1	4.76	2	10.53
	Over 50 miles but within UK	25	62.5	13	61.9	12	63.16
	International	9	22.5	7	33.33	2	10.53

Table A3.11d Largest Market By Employment Group

		Employment <10		Employment 11<20		Employment 21<40		Employment >40	
		No.	Percent.	No.	Percent.	No.	Percent.	No.	Percent.
Largest Market	Within 10 miles	1	14.29	0	0	1	8.33	1	9.09
	Within 11-50 miles	1	14.29	0	0	0	0	2	18.18
	Over 50 miles but within UK	4	57.14	9	90	5	41.67	7	63.64
	International	1	14.29	1	10	6	50	1	9.09

Mann Whitney Test Differences in the Means between Services and Manufacturing Companies Table A3.11a			
	Z value	P-value	Exact P-value
Number of serious competitors	-0.622	0.534	0.543
Number of serious competitors larger than my company	0.368	0.713	0.721
Number of serious overseas competitors	**2.331**	**0.020**	**0.020****
Percentage of sales to largest customer	0.169	0.866	0.873

Median Test Differences in the Medians between Services and Manufacturing Companies Table A3.11a				
	Chi2	P-value	chi2 Continuity corrected	P-value
Number of serious competitors	0.022	0.882	0.030	0.863
Number of serious competitors larger than my company	0.244	0.621	0.030	0.863
Number of serious overseas competitors	**7.442**	**0.006**	**5.797**	**0.016****
Percentage of sales to largest customer	2.055	0.152	1.237	0.266

Mann Whitney Test Differences in the Means between 2 Employment Groups (Table A3.11b)			
	Z value	P-value	Exact P-value
Number of serious competitors	0.215	0.830	0.837
Number of serious competitors larger than my company	0.575	0.565	0.574
Number of serious overseas competitors	-1.107	0.268	0.276
Percentage of sales to largest customer	1.145	0.252	0.258

Median Test Differences in the Medians between 2 Employment Groups (Table A3.11b)				
	Chi2	P-value	chi2 Continuity corrected	P-value
Number of serious competitors	1.113	0.291	0.531	0.466
Number of serious competitors larger than my company	1.113	0.291	0.531	0.466
Number of serious overseas competitors	1.367	0.242	0.711	0.399
Percentage of sales to largest customer	1.113	0.291	0.531	0.466

Kruskal-Wallis Rank Test between 2 Employment Groups (Table A3.11b)				
	Chi2	P-value	Chi2 adjusted for ties	P-value
Number of serious competitors	0.046	0.830	0.046	0.830
Number of serious competitors larger than my company	0.326	0.568	0.331	0.565
Number of serious overseas competitors	1.057	0.304	1.226	0.268
Percentage of sales to largest customer	1.304	0.253	1.312	0.252

Kruskal-Wallis Rank Test between 4 Employment Groups (Table A3.11b)				
	Chi2	P-value	Chi2 adjusted for ties	P-value
Number of serious competitors	0.745	0.863	0.753	0.861
Number of serious competitors larger than my company	1.520	0.678	1.543	0.673
Number of serious overseas competitors	3.191	0.363	3.704	0.295
Percentage of sales to largest customer	6.013	0.111	6.048	0.109

Two-sample Test of Proportions for Largest Market Between Manufacturing and Service Companies (Table A3.11c)			
		Z-value	P-value
Largest Market	**Within 10 miles**	**-1.893**	**0.058****
	Within 11-50 miles	-0.691	0.489
	Over 50 miles but within UK	-0.082	0.935
	International	**1.725**	**0.085***

Two-sample Test of Proportions for Largest Market Between 2 Employment Groups (Table A3.11d)			
		Z-value	P-value
Largest Market	Within 10 miles	-0.334	0.738
	Within 11-50 miles	-0.334	0.738
	Over 50 miles but within UK	1.569	0.117
	International	-1.398	0.162

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.11d)					
		Chi2	P-value	Chi2 adjusted for ties	P-value
Largest Market	Within 10 miles	0.270	0.966	1.294	0.731
	Within 11-50 miles	0.824	0.844	3.956	0.266
	Over 50 miles but within UK	3.801	0.284	5.402	0.145
	International	3.831	0.280	7.318	0.062

Table A3.12 The Use and Importance of Performance Indicators

The Use and Importance of Performance Indicators	All Companies (Percentage of Companies)			
	Not Used	Slightly Important	Important	Highly Important
Level of Profits	0.0	12.5	50	37.5
Profit Margin on Sales/Turnover	2.5	17.5	45	35.0
Profitability (Return on Assets)	27.5	30.0	32.5	10.0
Growth of Sales/Turnover	2.5	42.5	37.5	17.5
Turnover per Employee	52.5	30	10	7.5
Profits per Employee	57.5	20	15	7.5
Wages plus Profits per Employee	67.5	12.5	15	5.0
Other indicator (3 selected)	0.0	0.0	33.3	66.7

Table A3.13 The Use and Importance of Performance Indicators by Sector

The Use and Importance of Performance Indicators	Percentage of Companies							
	Not Used		Slightly Important		Important		Highly Important	
	Mfg	Services	Mfg	Services	Mfg	Services	Mfg	Services
Level of Profits	0	0	19.1	5.3	38.1	63.2	42.9	31.6
Profit Margin on Sales/Turnover	0	5.3	19.1	15.8	38.1	52.6	42.9	26.3
Profitability (Return on Assets)	19.1	36.8	38.1	21.1	33.3	31.6	9.5	10.5
Growth of Sales/Turnover	0	5.3	52.4	31.6	28.6	47.4	19.1	15.8
Turnover per Employee	52.4	52.6	28.5	31.6	14.3	5.3	4.8	10.5
Profits per Employee	57.1	57.9	23.8	15.8	14.3	15.8	4.8	10.5
Wages plus Profits per Employee	66.7	68.4	14.3	10.5	14.3	15.8	4.8	5.3
Other indicator (Mgf 2 selected; Services 1 selected)	0	0.0	0.0	0.0	50.0	0.0	50.0	100.0

Two-sample Test of Proportions Between Manufacturing and Service Companies (Table A3.13)		
	Z-value	P-value
%USING WAGES PLUS PROFITS PER EMPLOYEE	0.118	0.906
% RATING WAGES PLUS PROFITS PER EMPLOYEE AS IMPORTANT OR HIGHLY IMPORTANT	-0.158	0.874

Two-sample Test of Proportions Between 2 Employment Groups (Table A3.13)		
	Z-value	P-value
%USING WAGES PLUS PROFITS PER EMPLOYEE	-0.359	0.720
% RATING WAGES PLUS PROFITS PER EMPLOYEE AS IMPORTANT OR HIGHLY IMPORTANT	0.480	0.631

Kruskal-Wallis Rank Test by 4 Employment Groups (Table A3.13)				
	Chi2	P-value	Chi2 adjusted for ties	P-value
%USING WAGES PLUS PROFITS PER EMPLOYEE	**4.158**	**0.245**	**6.314**	**0.097***
% RATING WAGES PLUS PROFITS PER EMPLOYEE AS IMPORTANT OR HIGHLY IMPORTANT	2.272	0.518	4.730	0.193

Kruskal-Wallis Rank Test by 4 Age Groups (Table A3.13)				
	Chi2	P-value	Chi2 adjusted for ties	P-value
%USING WAGES PLUS PROFITS PER EMPLOYEE	0.493	0.9204	0.749	0.8617
% RATING WAGES PLUS PROFITS PER EMPLOYEE AS IMPORTANT OR HIGHLY IMPORTANT	0.405	0.9391	0.844	0.8389

Table A3.14 The Significance of Factors Affecting Ability to Meet Business Objectives

Factors affecting Ability to meet Business Objectives	All Companies (Percentage of Companies) --- Total Obs. 39				
	Very Significant Negative Effect	Moderately Significant Negative Effect	Neither Significant Negative or Positive Effect	Moderately Significant Positive Effect	Very Significant Positive Effect
Availability and cost of finance for expansion	7.69	20.51	53.85	15.38	2.56
Availability and cost of overdraft finance	2.56	25.64	58.97	10.26	2.56
Access to Skilled labour	12.82	28.21	15.38	35.9	7.69
Management skills	2.56	17.95	30.77	35.9	12.82
Effectiveness of my company's management practices	0	15.38	23.08	41.03	20.51
Marketing and sales skills	5.13	28.21	20.51	28.21	17.95
Acquisition of technology	0	10.26	43.59	38.46	7.69
Ability to implement new technology	2.56	12.82	35.9	33.33	15.38
Availability of appropriate premises or site	2.56	15.38	48.72	23.08	10.26
Access to overseas markets	2.56	10.26	56.41	17.95	12.82
Growth of demand in principal product markets	0	17.95	28.21	43.59	10.26
Changing intensity of competition in principal product markets	5.13	23.8	56.41	10.26	5.13

Table A3.14b The Significance of Factors Affecting Ability to Meet Business Objectives by Sector

Factors affecting Ability to meet Business Objectives	Net Significant Effect	
	Manufacturing Companies	Service Companies
Availability and cost of finance for expansion	-4.76	-15.79
Availability and cost of overdraft finance	-23.81	-5.26
Access to Skilled labour	-9.52	15.79
Management skills	33.33	21.05
Effectiveness of my company's management practices	47.62	42.11
Marketing and sales skills	9.52	15.79
Acquisition of technology	47.62	21.05
Ability to implement new technology	38.10	26.32
Availability of appropriate premises or site	14.29	15.79
Access to overseas markets	28.57	5.26
Growth of demand in principal product markets	52.38	15.79
Changing intensity of competition in principal product markets	-14.29	-10.53

Table A3.14c The Significance of Factors Affecting Ability to Meet Business Objectives by Size

Factors affecting Ability to meet Business Objectives	Net Significant Effect			
	Employment <10	Employment 11<20	Employment 21<40	Employment >40
Availability and cost of finance for expansion	-28.27	20	-16.67	-18.18
Availability and cost of overdraft finance	0	0	-25	-27.27
Access to Skilled labour	42.85	-20	-16.67	18.18
Management skills	14.29	10	50	27.27
Effectiveness of my company's management practices	28.57	30	66.67	45.45
Marketing and sales skills	28.57	-40	33.33	27.27
Acquisition of technology	-28.57	60	25	63.64
Ability to implement new technology	-28.57	50	33.33	54.55
Availability of appropriate premises or site	-14.29	-10	41.67	27.27
Access to overseas markets	28.57	10	25	9.09
Growth of demand in principal product markets	28.57	10	25	72.73
Changing intensity of competition in principal product markets	-42.86	0	-8.33	-9.09

Table A3.14d The Significance of Factors Affecting Ability to Meet Business Objectives by Age

Factors affecting Ability to meet Business Objectives	Net Significant Effect			
	Age <20	Age 20<30	Age 30<40	Age >40
Availability and cost of finance for expansion	-23.08	-42.86	11.11	9.09
Availability and cost of overdraft finance	-7.69	-42.86	-11.11	-9.09
Access to Skilled labour	15.38	-28.57	22.22	-9.09
Management skills	30.77	-14.29	44.44	36.36
Effectiveness of my company's management practices	38.46	0	55.56	72.73
Marketing and sales skills	30.77	-14.29	0	18.18
Acquisition of technology	53.85	14.29	22.22	36.36
Ability to implement new technology	53.85	14.29	11.11	36.36
Availability of appropriate premises or site	15.38	28.57	-11.11	27.27
Access to overseas markets	0	14.29	66.67	0
Growth of demand in principal product markets	23.08	0	77.78	36.36
Changing intensity of competition in principal product markets	-15.38	-42.86	22.22	-18.18

Two-sample Test of Proportions for NEGATIVE EFFECTS Between Manufacturing and Service Companies (Table A3.14)				
Factors affecting Ability to meet Business Objectives	Mfg (Percentage of Companies)	Service (Percentage of Companies)	Z-value	P-value
Availability and cost of finance for expansion	28.57	26.32	0.160	0.873
Availability and cost of overdraft finance	33.33	21.05	0.869	0.385
Access to Skilled labour	47.62	31.58	1.035	0.301
Management skills	19.05	21.05	-0.158	0.874
Effectiveness of my company's management practices	14.29	15.79	-0.133	0.894
Marketing and sales skills	33.33	31.58	0.118	0.906
Acquisition of technology	**0.0**	**21.05**	**-2.216**	**0.027****
Ability to implement new technology	9.52	21.05	-1.020	0.308
Availability of appropriate premises or site	19.05	15.79	0.271	0.787
Access to overseas markets	14.29	10.53	0.359	0.720
Growth of demand in principal product markets	9.52	26.32	-1.396	0.163
Changing intensity of competition in principal product markets	33.33	21.05	0.869	0.385

Two-sample Test of Proportions for NEGATIVE EFFECTS Between 2 Employment Groups (Table A3.14)				
Factors affecting Ability to meet Business Objectives	Employment <20 (Percentage of Companies)	Employment >=21 (Percentage of Companies)	Z-value	P-value
Availability and cost of finance for expansion	17.65	34.78	-1.200	0.230
Availability and cost of overdraft finance	17.65	34.78	1.200	0.230
Access to Skilled labour	35.29	43.48	-0.522	0.602
Management skills	17.65	21.74	-0.320	0.749
Effectiveness of my company's management practices	17.65	13.04	0.403	0.687
Marketing and sales skills	**47.06**	**21.74**	**1.690**	**0.091***
Acquisition of technology	11.76	8.70	0.320	0.749
Ability to implement new technology	17.65	13.04	0.403	0.687
Availability of appropriate premises or site	23.53	13.04	0.863	0.388
Access to overseas markets	11.76	13.04	-0.121	0.904
Growth of demand in principal product markets	17.65	17.39	0.021	0.983
Changing intensity of competition in principal product markets	29.41	26.09	0.233	0.816

Two-sample Test of Proportions for POSITIVE EFFECTS Between Manufacturing and Service Companies (Table A3.14)				
Factors affecting Ability to meet Business Objectives	Mfg (Percentage of Companies)	Service (Percentage of Companies)	Z-value	P-value
Availability and cost of finance for expansion	23.81	10.53	1.104	0.270
Availability and cost of overdraft finance	9.52	15.79	-0.598	0.550
Access to Skilled labour	38.10	47.37	-0.593	0.554
Management skills	52.38	42.11	0.650	0.516
Effectiveness of my company's management practices	61.90	57.89	0.259	0.796
Marketing and sales skills	42.86	47.37	-0.286	0.775
Acquisition of technology	47.62	42.11	0.350	0.726
Ability to implement new technology	47.62	47.37	0.016	0.987
Availability of appropriate premises or site	33.33	31.58	0.118	0.906
Access to overseas markets	**42.86**	**15.79**	**1.866**	**0.062***
Growth of demand in principal product markets	61.90	42.11	1.252	0.211
Changing intensity of competition in principal product markets	19.05	10.53	0.754	0.451

Two-sample Test of Proportions for POSITIVE EFFECTS Between 2 Employment Groups (Table A3.14)				
Factors affecting Ability to meet Business Objectives	Employment <20 (Percentage of Companies)	Employment >=21 (Percentage of Companies)	Z-value	P-value
Availability and cost of finance for expansion	17.65	17.39	0.021	0.983
Availability and cost of overdraft finance	17.65	8.70	0.846	0.397
Access to Skilled labour	41.18	43.48	-0.146	0.884
Management skills	**29.41**	**60.87**	**-1.970**	**0.049****
Effectiveness of my company's management practices	47.06	69.57	-1.436	0.151
Marketing and sales skills	35.29	52.17	-1.061	0.289
Acquisition of technology	35.29	52.17	-1.061	0.289
Ability to implement new technology	35.29	56.52	-1.329	0.184
Availability of appropriate premises or site	**11.76**	**47.83**	**-2.407**	**0.016****
Access to overseas markets	29.41	30.43	-0.070	0.944
Growth of demand in principal product markets	**35.29**	**65.22**	**-1.873**	**0.061***
Changing intensity of competition in principal product markets	11.76	17.39	-0.493	0.622

Mann Whitney Test on Net Significant Effect by Sector			
	Z value	P-value	Exact P-value
Availability and cost of finance for expansion	0.467	0.6405	0.7673
Availability and cost of overdraft finance	-0.946	0.3439	0.4194
Access to Skilled labour	-0.864	0.3874	0.4750
Management skills	0.543	0.5870	0.6561
Effectiveness of my company's management practices	0.248	0.8044	0.9017
Marketing and sales skills	-0.233	0.8157	0.8897
Acquisition of technology	0.989	0.3228	0.3256
Ability to implement new technology	0.370	0.7114	0.7645
Availability of appropriate premises or site	-0.044	0.9646	1.0000
Access to overseas markets	1.287	0.1982	0.1864
Growth of demand in principal product markets	1.448	0.1477	0.1973
Changing intensity of competition in principal product markets	-0.260	0.7951	0.7640

Median Test on Net Significant Effect by Sector				
	chi2	P-value	chi2 Continuity corrected	P-value
Availability and cost of finance for expansion	1.2191	0.270	0.4726	0.492
Availability and cost of overdraft finance	0.3580	0.550	0.0143	0.905
Access to Skilled labour	0.3510	0.554	0.0741	0.785
Management skills	0.4224	0.516	0.1108	0.739
Effectiveness of my company's management practices	NA	NA	NA	NA
Marketing and sales skills	0.0820	0.775	0.0010	0.975
Acquisition of technology	0.1125	0.726	0.0010	0.975
Ability to implement new technology	0.0003	0.987	0.0907	0.763
Availability of appropriate premises or site	0.0140	0.906	0.0483	0.826
Access to overseas markets	3.4801	0.062	2.3105	0.128
Growth of demand in principal product markets	NA	NA	NA	NA
Changing intensity of competition in principal product markets	0.5681	0.451	0.0963	0.756

Kruskal-Wallis Rank Test Across 4 Employment Groups: Net Significant Effect				
	chi2	P-value	chi2 adjusted for ties	P-value
Availability and cost of finance for expansion	2.243	0.5235	2.776	0.4274
Availability and cost of overdraft finance	1.322	0.7240	1.735	0.6291
Access to Skilled labour	2.376	0.4981	2.781	0.4266
Management skills	1.911	0.5910	2.246	0.5230
Effectiveness of my company's management practices	1.586	0.6625	2.072	0.5576
Marketing and sales skills	4.037	0.2575	4.675	0.1972
Acquisition of technology	**8.079**	**0.0444**	**9.886**	**0.0196****
Ability to implement new technology	**6.053**	**0.1091**	**7.229**	**0.0649***
Availability of appropriate premises or site	4.332	0.2277	5.183	0.1589
Access to overseas markets	0.586	0.8995	0.750	0.8613
Growth of demand in principal product markets	3.264	0.3526	3.964	0.2654
Changing intensity of competition in principal product markets	1.527	0.6761	1.942	0.5845

Kruskal-Wallis Rank Test Across 4 Age Groups: Net Significant Effect				
	chi2	P-value	chi2 adjusted for ties	P-value
Availability and cost of finance for expansion	3.195	0.3625	3.954	0.2664
Availability and cost of overdraft finance	1.263	0.7378	1.659	0.6462
Access to Skilled labour	1.375	0.7113	1.610	0.6572
Management skills	1.866	0.6007	2.192	0.5334
Effectiveness of my company's management practices	2.886	0.4096	3.770	0.2874
Marketing and sales skills	1.210	0.7505	1.401	0.7052
Acquisition of technology	1.749	0.6261	2.140	0.5438
Ability to implement new technology	1.864	0.6012	2.226	0.5269
Availability of appropriate premises or site	1.715	0.6336	2.052	0.5617
Access to overseas markets	**5.899**	**0.1166**	**7.549**	**0.0563***
Growth of demand in principal product markets	3.764	0.2881	4.571	0.2061
Changing intensity of competition in principal product markets	3.203	0.3614	4.074	0.2536