

STATE OF SMALL BUSINESS BRITAIN REPORT 2019

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The State of Small Business Britain

Part A: SME Trends and Recent Research

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SME Trends and Recent Research

1. Introduction

The increasing levels of political uncertainty in the UK sets the context for this review of trends in the small business community in mid-2019. We seek to provide an overview of business confidence and the extent to which that is reflected in the key datasets we have been monitoring for many years.

We focus on the following:

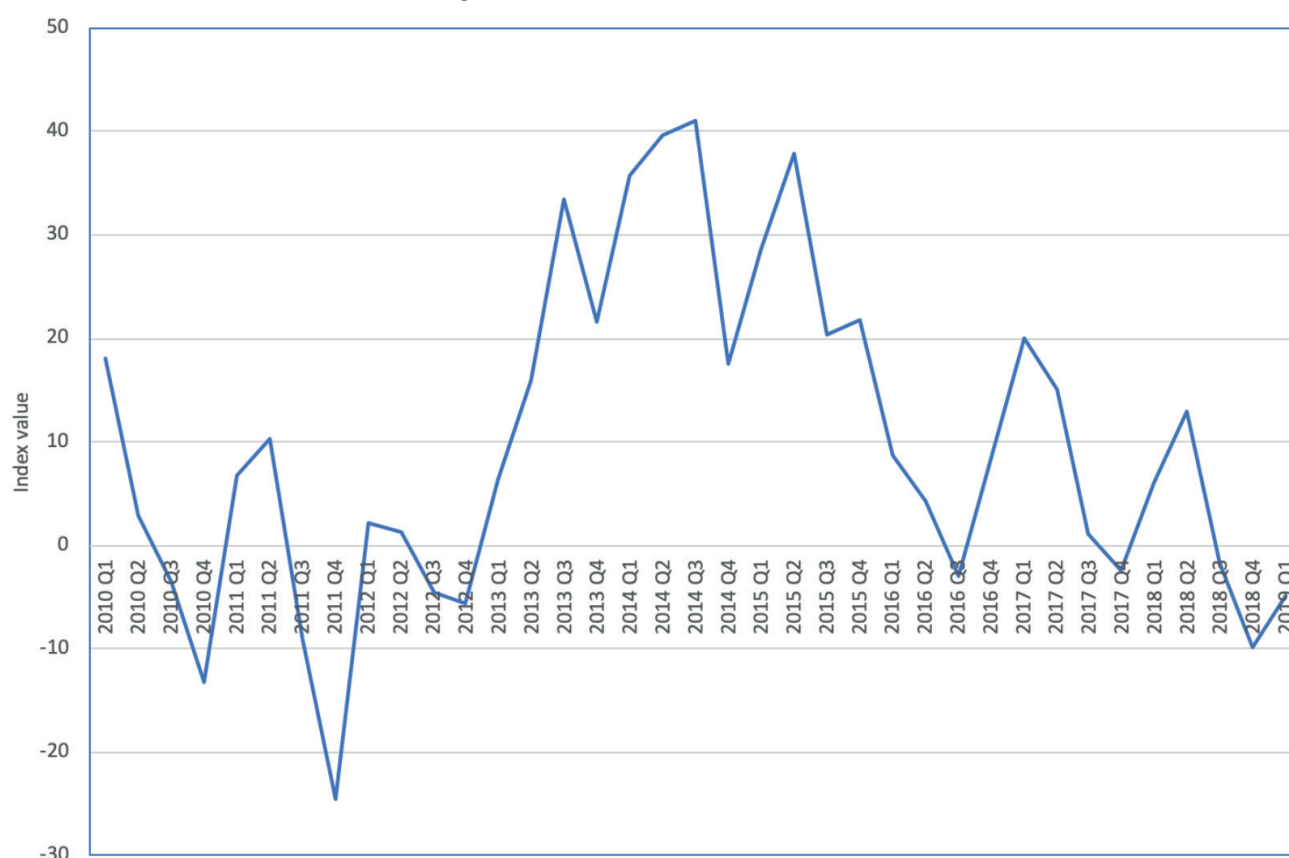
- Business Confidence
- Job Creation and Destruction
- Entrepreneurship
- Firm Growth

Alongside this we will highlight some of the key messages coming out of our core research programme, which provide insights into current debates on high-growth, productivity and management practices.

2. Business Confidence

Evidence shows that business confidence is in negative territory, purchasing indices and investment measures paint a weak – and perhaps deteriorating picture – and broader evidence suggests a downward click in UK business start-ups. This makes it hard to disagree that ‘businesses of all sizes are indicating that uncertainty has been clouding their outlook and this is feeding through into investment, stockpiling and hiring decisions’.¹ The Federation of Small Businesses’ Business Confidence Index (BCI), for example, has been falling consistently since 2015 (Figure 1.1). Regional and sectoral samples in the BCI are smaller but suggest a particular weakening of confidence among exporters and consumer facing, property-based businesses in Accommodation and Food Services and Retail.

Figure 1.1: FSB Business Confidence Index



Source: FSB (2019) 'FSB Voice of Small Business Index Q1', 2019. N=1,065.

¹ FSB (2019) 'FSB Voice of Small Business Index Q1', p. 9.

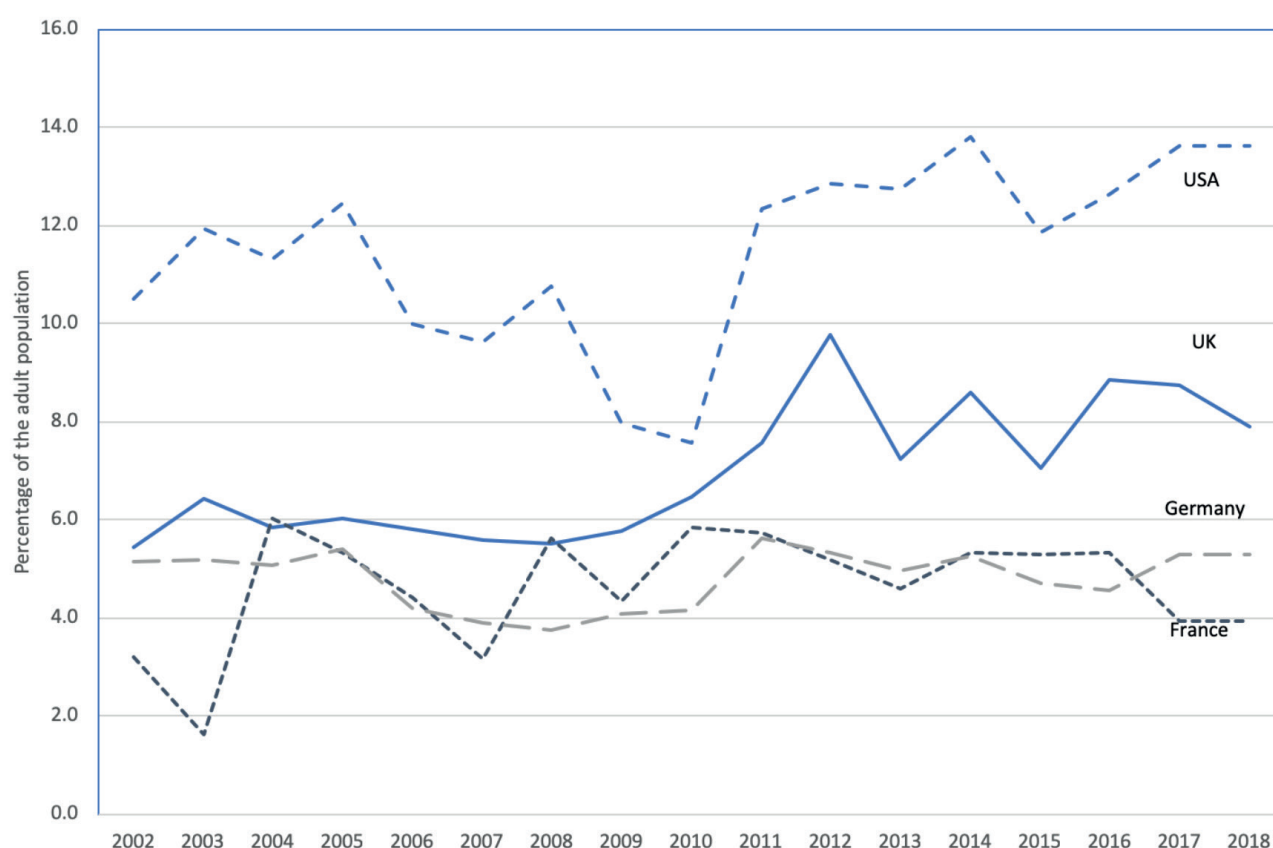
Despite these negative signs, short-term labour market indicators for the UK remain robust with record employment rates and sustained falls in unemployment and economic inactivity. Against trend, the number of vacancies in the UK fell marginally, however, during 2019 Q1, perhaps a sign of firms' reluctance to recruit given macro-uncertainty.² We will return to this employment topic later in this review with the ERC's unique analysis of job creation and destruction.

How are these broader trends impacting on the UK's SMEs? In the following sections we consider some of the latest data on entrepreneurship and new business activity (Section 3), evidence from the Longitudinal Small Business survey on existing businesses (Section 4) and a review of overall jobs growth (Section 5). Section 6 then provides a brief review of recent ERC research, much of which adopts a longer-term perspective.

3. Entrepreneurship

Low levels of business confidence in the UK are also evident in some of the latest evidence on entrepreneurial activity and firm growth. Both are key indicators given the importance of new firms and those firms growing rapidly in creating new jobs (see below). Perhaps the best evidence on levels of entrepreneurial activity comes from the Global Entrepreneurship Monitor (or GEM) survey (www.gemconsortium.org). A key GEM indicator is the measure of Total Early-Stage Entrepreneurial Activity, or TEA rate, which measures the proportion of the adult population engaged in early-stage enterprises (Figure 1.2). The most recent data relates to 2018, and while levels of entrepreneurial activity have remained stable in France, Germany and the US, they have fallen in the UK since 2017. It is significant, however, that levels of entrepreneurial activity in the UK remain well above those in France and Germany.

Figure 1.2: Total Entrepreneurial Activity Among the Adult Population

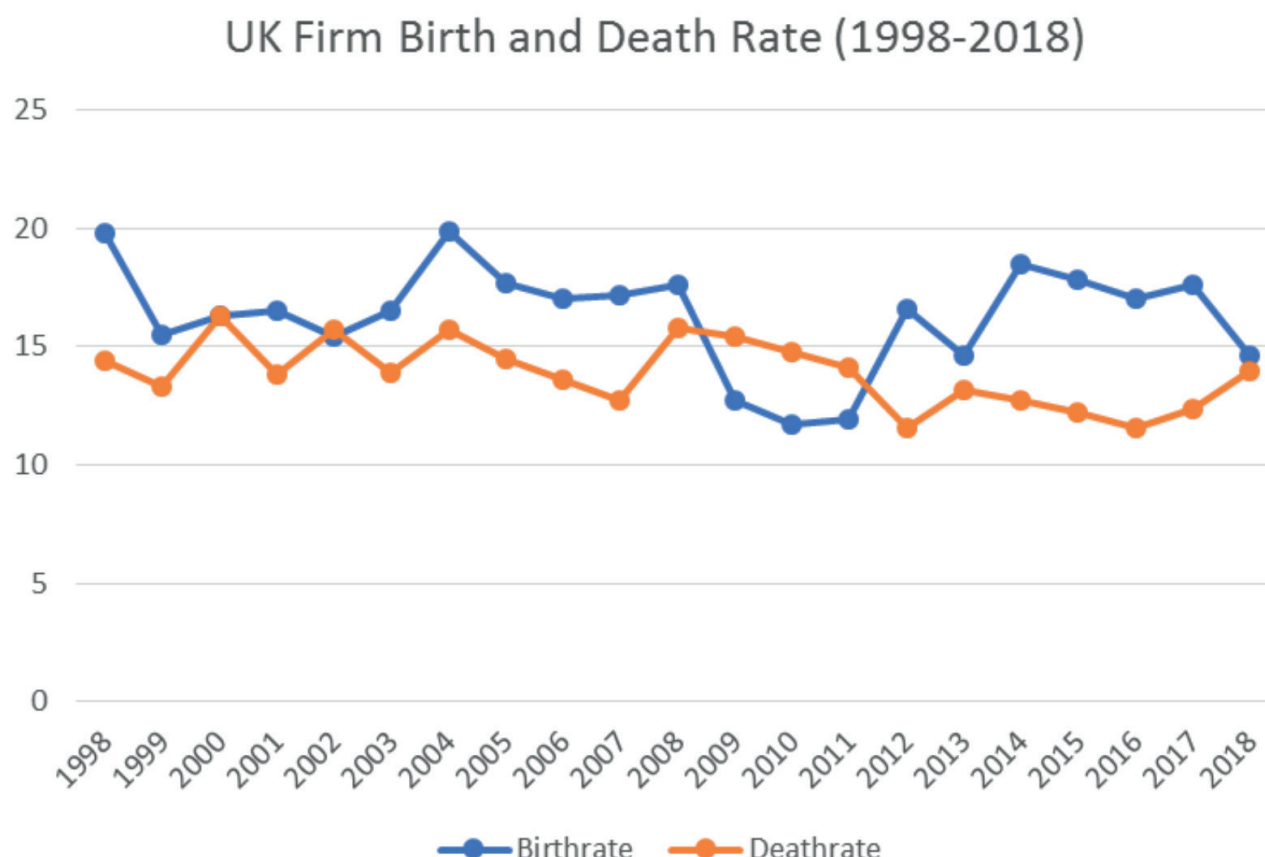


Source: GEM Adult Population Survey (APS) UK (2002-2018).

² ONS Labour Market Overview: May 2019. Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/uklabourmarket/may2019>

This downturn in new venture creation is reflected in the ONS business demography analysis which identified a fall in the business birth rate between 2016 and 2017 as well as an increase in business death rates over the same period. Births fell from 414,000 in 2016 to 382,000 in 2017 with deaths rising from 288,000 to 357,000. While births remained above deaths in 2017 the gap was the smallest since the post-recession period of 2012.³ The ERC's own business demography analysis over the last 20 years confirms this trend with a sharp fall in business entry (with at least one employee) between 2017 and 2018 and a rise in business exits since 2016.

Figure 1.3: Business Birth and Death Rates in the UK



Source: ONS Business Structure Database (1998-2018)

4. Established Businesses

Newly published data from the Longitudinal Small Business Survey 2018 (Box 2) provides a robust view of all existing employer businesses in the UK (i.e. those firms with one or more employees). The survey was undertaken in late-2018 during a period of significant economic and political uncertainty and this may be reflected in the findings.

The findings suggest few dramatic changes over the last year, although the proportion of businesses anticipating growth and profitability is notably stronger in professional services than in other sectors of the economy. Brexit is cited as a 'major obstacle' by around a third of established SMEs with the main impacts being increasing input costs and reduced investment. Further, and unrelated to Brexit, new information from the survey on the use of management practices by SMEs emphasises the differences in management practice between firm sizebands.

³ ONS (2018) 'Business demography, UK: 2017'. November. Available at: <https://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/bulletins/businessdemography/2017>.

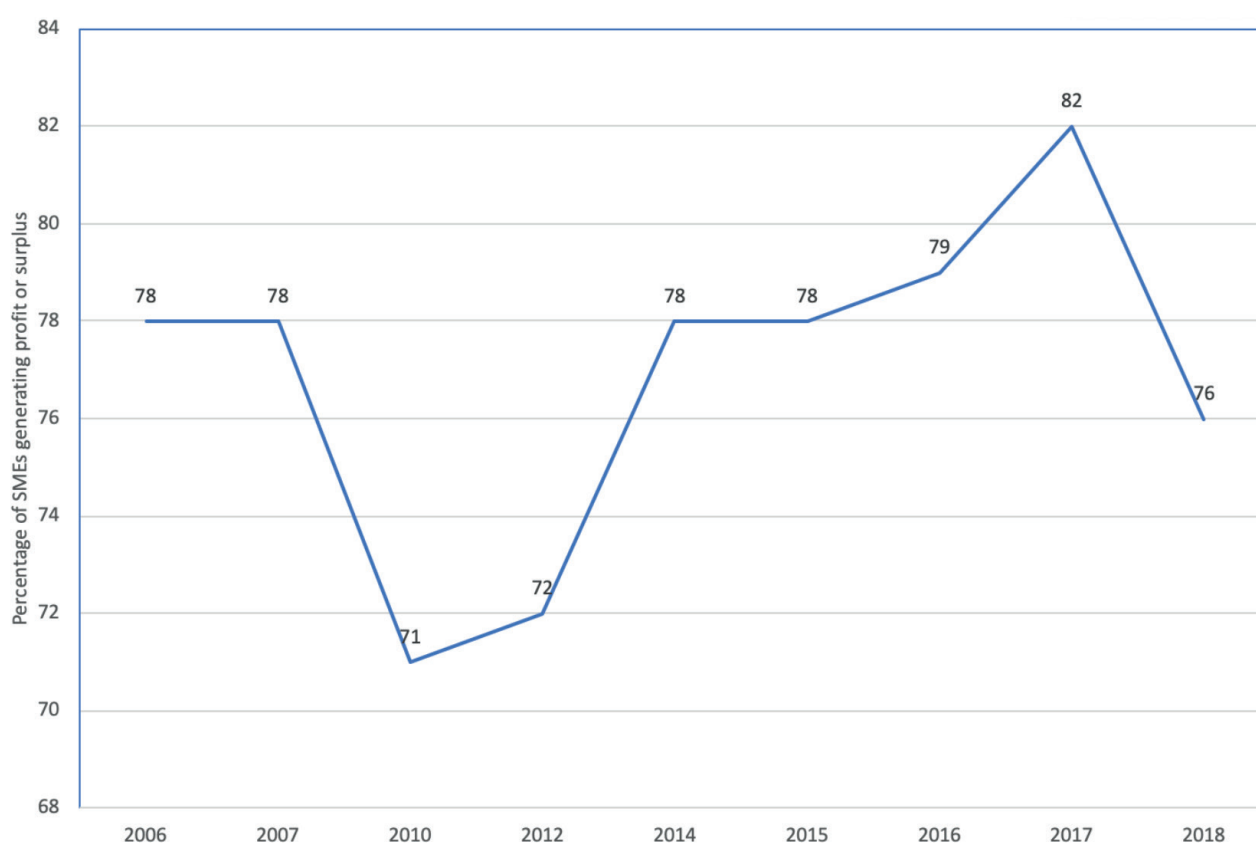
Box 2: The Longitudinal Small Business Survey (LSBS)⁴

The LSBS is a large-scale telephone survey conducted each year and funded by the Department for Business, Energy and Industrial Strategy (BEIS). The 2018 survey was conducted between July 2018 and January 2019 and included responses from 15,015 companies. The 2018 survey was the largest wave of the LSBS so far undertaken and included both a panel element and 'top-ups' to achieve the required national coverage. Interviews are conducted with the Managing Director or a member of a firm's senior management team. Survey responses are weighted to provide representative results.

Around 64 per cent of SMEs had constant employment in 2017-8, with 22 per cent of SMEs increasing employment. These proportions were very similar to those in previous years. Growth was more common among medium-sized firms, 40 per cent of these firms experienced growth in employment. Jobs growth was most common in Education, Administration and Support and Information and Communications. Very similar proportions of SMEs also anticipate jobs growth over the next twelve months.

Only 76 per cent of SMEs reported trading profitably in their last financial year, however, a six percentage point fall since 2017, and a marked break with the stable trend of previous years (Figure 2). Firms were most likely to report a profit or surplus in Professional and Scientific Services, Finance and Real Estate, Administration and Support and Construction.

Figure 1.4: Percentage of SMEs Generating a Profit or Surplus



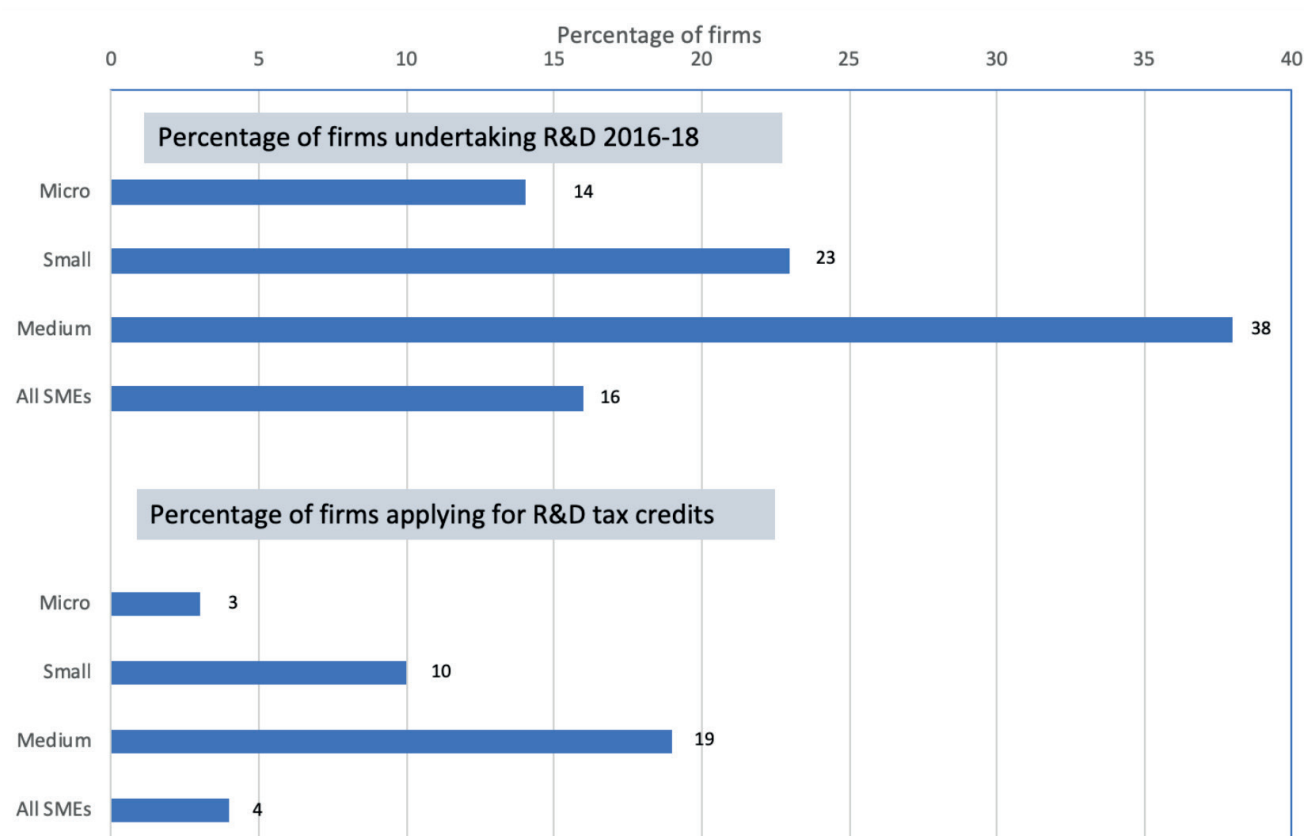
Source: LSBS (2018)

In terms of exporting the position appears more stable with 20 per cent of SMEs exporting goods or services in 2018 (2017, 20 per cent). For around two-thirds of exporting firms, however, exports accounted for less than 25 per cent of their total sales. Export propensity varies widely across sectors. The highest export proportions were in Manufacturing (43 per cent); Information and Communications (39 per cent), and Professional and Scientific services (30 per cent). The destination of export sales has also changed relatively little: 78-79 per cent of exporting SMEs were selling into the EU in each of the last three years.

⁴ <https://www.gov.uk/government/collections/small-business-survey-reports>

In terms of innovation, process innovations were introduced by around 1:5 SMEs but around 1:3 medium-sized firms over the three years prior to the LSBS 2018 survey. These proportions were very similar to those in 2017. Around 16 per cent of SMEs reported undertaking R&D over the previous three years, although this proportion varied significantly by sizeband (Figure 1.5), as did the proportion of firms applying for R&D tax credits. Comparing the proportions directly suggests that around half of medium-sized firms undertaking R&D were using tax credits compared to only around 1:5 of micro-businesses.

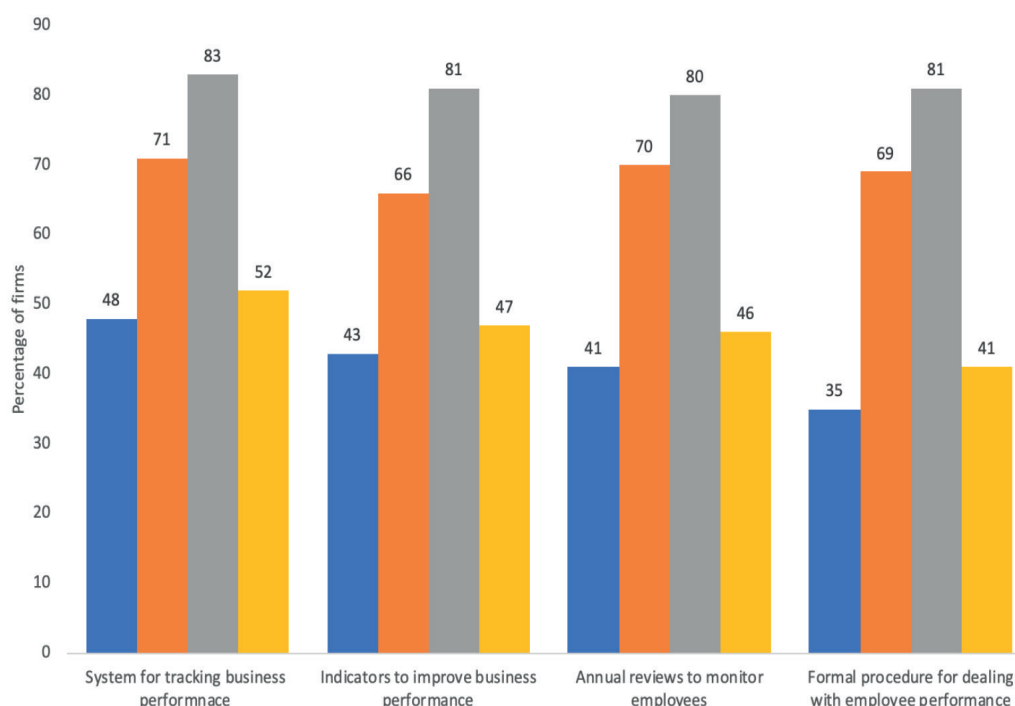
Figure 1.5: Percentage of SMEs Undertaking R&D and Applying for Tax Credits



Source: LSBS (2018)

The LSBS also provides information on firms' training and apprenticeship activity both of which differed little in 2018 from their 2017 levels. Twelve per cent of SMEs had formal apprenticeship starts in 2018, with 13 per cent intending to have new starts in 2019. For the first time in 2018 the LSBS also collected data on a range of management practices, which have been linked to productivity growth in larger firms. More than half of all SMEs have some system for tracking business performance with 41-46 per cent of firms reviewing individual employees' performance. These proportions varied significantly by firm sizeband, however, with micro-businesses consistently less likely to have management practices in place (Figure 1.6).

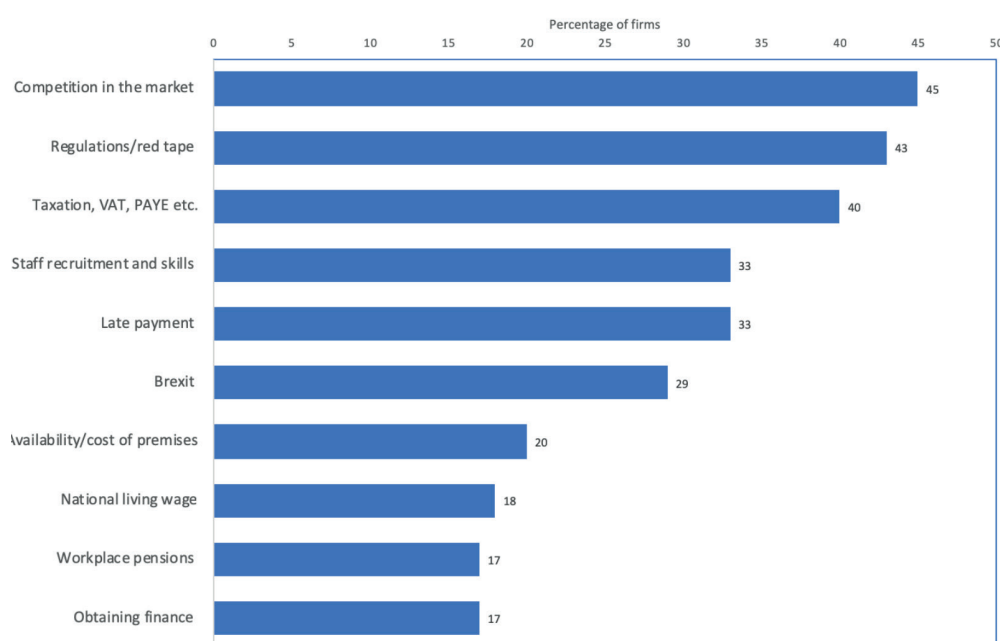
Figure 1.6: Management Practices by Firm Sizeband: 2018



Source: LSBS (2018)

LSBS also provides relatively detailed information on the proportion of SMEs facing major obstacles to the success of their business. The most commonly cited obstacles – competition, regulations, taxation and skills – have remained stable over the last few years. Notably the proportion of firms citing lack of finance as a barrier is only around half that citing late payment (Figure 1.7). As noted earlier, Brexit is cited as a major obstacle by around a third of firms with the major impacts to date having been through the rising cost of imports from the EU, and a fall in investment. Over half of firms which have experienced difficulties as a result of Brexit report either having or expecting to face increased import costs. Around a third have or expect to reduce investment.

Figure 1.7: Obstacles to Success of the Business: 2018



Source: LSBS (2018)

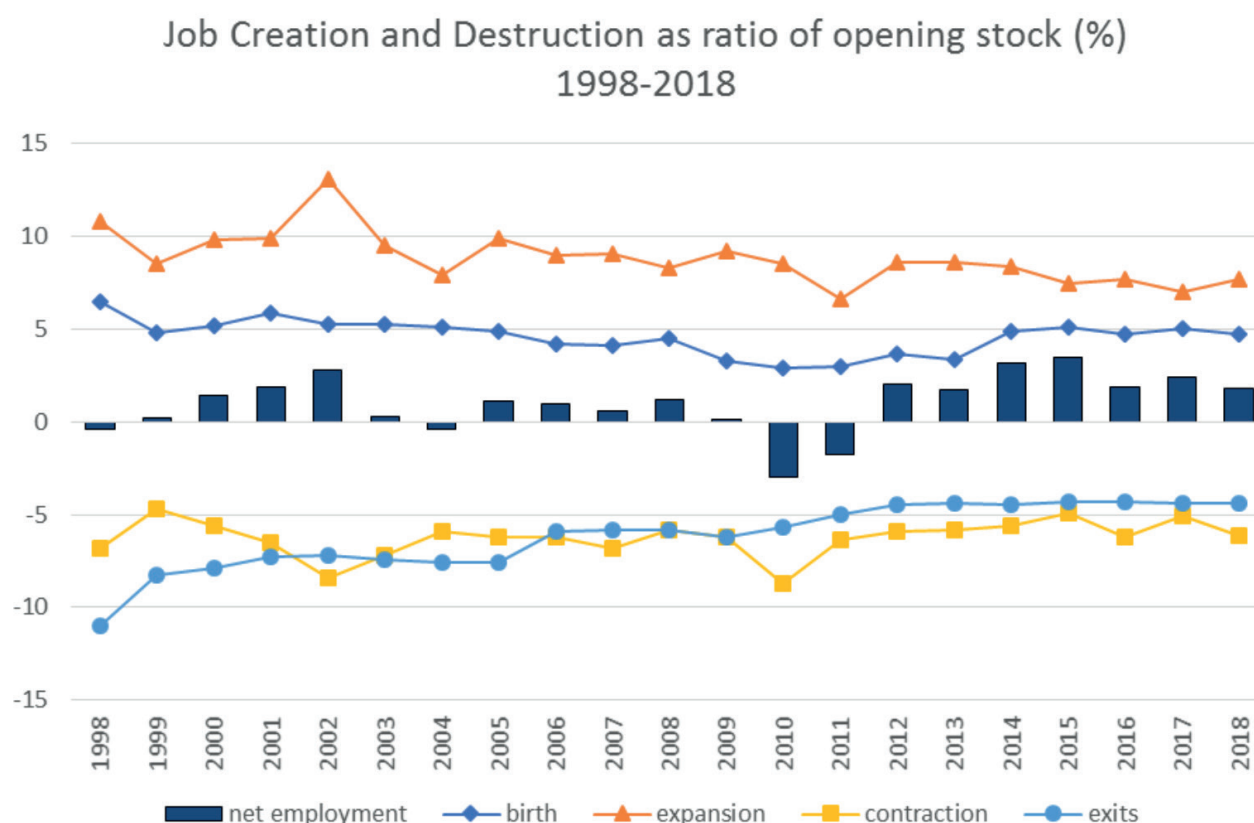
5. Job Creation and Destruction

One way of looking at the contribution of different types of firms to net jobs growth is by looking separately at job creation and job destruction.⁵ Using an established international analytical framework⁶ for job creation and destruction recent analysis by the ERC, using data from the annual ONS Business Structure Database (BSD)⁷, estimated the contribution of new, growing, contracting and closing firms to overall churn in the labour market.⁸

The data provides a means of calculating job creation and destruction separately and suggests that between 2017 and 2018 2.25m job losses were compensated by 2.65m job gains resulting in a net gain of just under 400,000 jobs. In part this was due to a relatively sharp fall in the business birth rate while the death rate of businesses in the UK also rose slightly from 2017 to 2018 (Figure 1.8).

Net job change is also (more) strongly influenced by expanding and contracting businesses and the evidence suggests that between 2017 and 2018 the contribution of both expansions and contractions to overall job reallocation increased. Net employment change remained positive, however, although the nature of the jobs created is unclear from the BSD.

Figure 1.8: Job Creation and Destruction in the UK



Source: ONS Business Structure Database (1998-2018)

⁵ Job Creation is defined as the employment change summed over all businesses that expand or start up in a given year. Job Destruction is the employment change summed over all businesses that contract or exit in a year.

⁶ See, for example, Davis et al., (2008); "Turmoil and Growth: Young Businesses, Economic Churning and Productivity Gains".

⁷ The BSD draws on the Inter Departmental Business Register (IDBR) which in turn relies heavily on data collected by Her Majesty's Revenue and Customs (mainly VAT and PAYE returns). The BSD itself consists of a series of annual snapshots (March each year) of the IDBR which we have linked together to form firm-level longitudinal records. The resulting dataset has some disadvantages. Although the IDBR is a 'live register' which is updated more or less continuously (and the data is then picked up by the BSD every March) there are lags in the data. For example, because the IDBR is a 'live' register the March snapshots are not a conventional time series – they do not necessarily record data which reports activity levels for March, they are data as at March. Further, that data at March each year can refer to a range of time periods over the previous years. We make the assumption that the nature of those lags are consistent in each annual snapshot.

⁸ Hart, M and Prashar, N (2019) 'Job Creation and Destruction in the UK', ERC Insight Paper, March.

The sum of the job creation rate and the job destruction rate is referred to as **the job reallocation rate**. It summarises the overall volume of change and in essence represents the 'reshuffling of job opportunities across locations' (Davis et al., 1996).⁹ Tracking the job reallocation rate allows us to arrive at a measure of business dynamism for the economy.

Taking a granular view by looking at three contrasting sectors in the last 12 months in terms of their job reallocation rate (i.e., manufacturing and business services) provides some insights into the way the private sector is reacting to increasing levels of uncertainty (Table 1.1).

- **Manufacturing:** overall, job gains exceeded job losses as net employment increased by nearly 33,000 jobs between 2017 and 2018. The gross job churn was over 400,000 jobs. This small net increase was due to both new business entry and the expansion of existing businesses exceeding exits and the contraction of existing businesses. However, the expansion of existing businesses was more important by a factor of almost 2 compared to business entry. Looking at the last five years there is nothing exceptional about the last 12 months.
- **Business Services:** overall, job gains exceeded job losses as net employment increased by just over 136,000 jobs between 2017 and 2018. The gross job churn was nearly 2 million jobs. Job losses through exit exceeded job creation through new business entry and the sector grew because the expansion of existing businesses outweighed job losses through contraction. Looking at the last five years there has been a sharp rise in job losses through exit and contractions combined with a falling level of job creation through new business entry. This has been compensated by a rise in the scale of business expansion. This has been especially pronounced in the last 12 months.
- **Personal Services:** overall, job gains exceeded job losses as net employment increased by nearly 31,000 jobs between 2017 and 2018. The gross job churn was just under 400,000 jobs. Job gains through business expansion was twice as important as job creation through business entry. There has been a sharp upturn in the scale of job losses through contraction in the last 12 months and a marked downturn in the number of jobs created through business entry since 2015.

Table 1.1: Job Creation and Destruction in Three Broad Sectors: 2017-2018

	Manufacturing		Business Services		Personal Services	
	Job Gains	Job Losses	Job Gains	Job Losses	Job Gains	Job Losses
Entries	82,558		375,062		70,341	
Expansion	147,883		659,649		138,855	
Exits		73,215		422,367		56,849
Contraction		124,419		476,179		121,416
Total	230,441	197,634	1,034,711	898,546	209,196	178,265
Net Job Change	32,807		136,165		30,931	
Gross Job Churn	428,075		1,933,257		387,461	
Job Reallocation Rate	16.1		30.6		22.9	

Source: ONS Business Structure Database (1998-2018)

⁹ Davis et al., (1996) Job Creation and Destruction, MIT Press: Cambridge Mass.

In summary, the UK's record levels of employment mask a more complex picture of business dynamism on the ground which more closely matches pre-recessionary periods. Firm-level data can be a useful 'canary in the mine' for an impending economic downturn and this is particularly significant in the context of record employment figures which could lull policymakers into a false sense of security.

There is an underlying level of turbulence in the private sector in periods of growth in the economy and this is an important indicator of business dynamism. So the faltering level of job creation from business entry and the rise in job losses in existing firms and though business exit should be seen as early signs of concern, especially in the current economic climate. What's clear is that established firms are already recording a net loss of jobs. So even if our headline employment figures are being propped up by start-ups creating new jobs, we are already witnessing a severe slowdown in hiring by the established firms that are vital to the health of our economy.

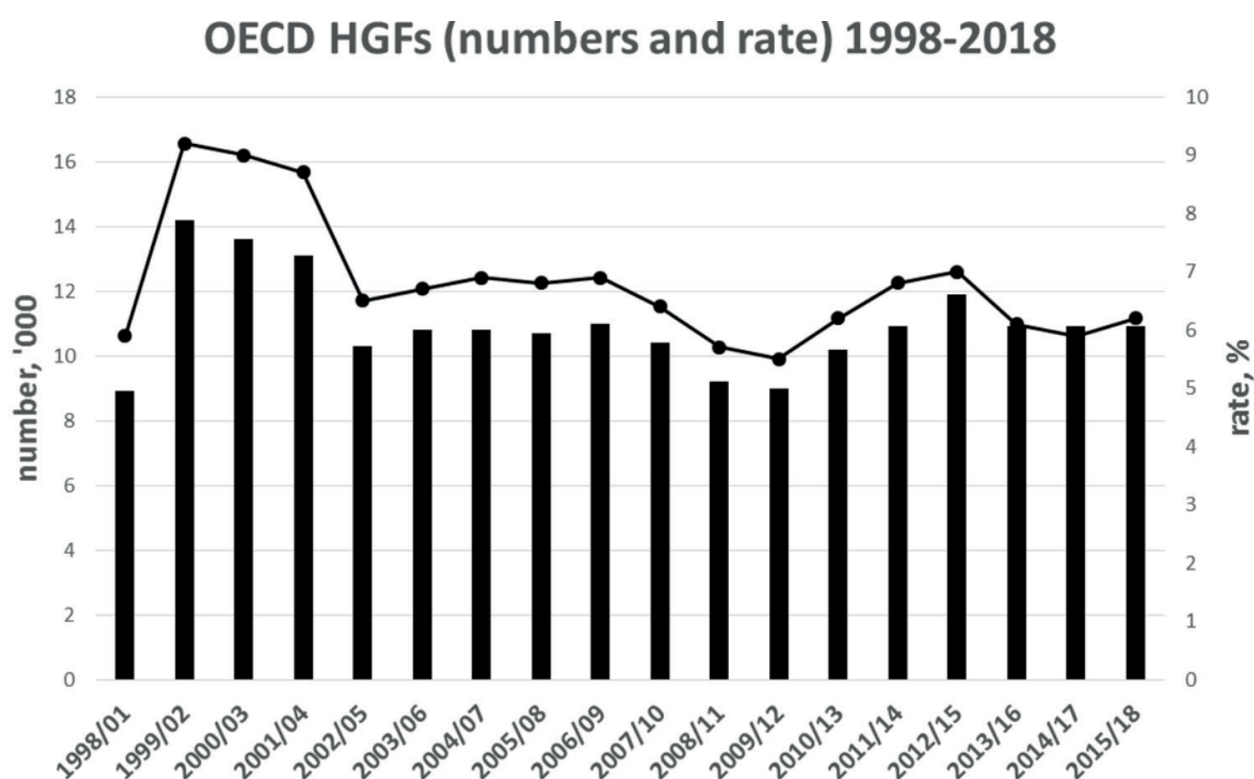
6. Research Round-up

ERC research considers both the broader aspects of business demographics related to the widespread policy discussion on 'high-growth' firms as well as intra-firm strategic issues related to finance, skills, management practices and innovation.

6.1 High-growth Firms and High-growth Episodes

One metric had dominated the policy debate on firm growth in recent years and that is the OECD defined 'High-Growth Firm'. ERC has been tracking this metric over the last 20 years and what we observe is that the trend in the number of high-growth firms (employment definition) has demonstrated a slow down since 2015 following the 'bounce-back' after the great recession. The absolute number has fallen year on year since 2015 although the incidence remains stuck at around 6 per cent (Figure 1.9).

Figure 1.9: OECD High-Growth Firms (Employment Definition)



Source: ONS Business Structure Database (1998-2018)

However, ERC research points to a more meaningful take on the process of high-or fast-growth. Do 'high-growth firms' exist? Or, is it simply the case that some firms experience episodes of high-growth? To examine these questions a recent ERC research paper looked at the experience of the 239,000 firms born in the UK in 1998.¹⁰ Of these just 3,331 had recorded episodes of high-growth by 2013 – i.e. they were classified as a high-growth firm (HGF) according to the OECD definition. But these HGFs, taken together, recorded 7,146 high-growth episodes. So, on average, each HGF recorded about two (potentially overlapping) high-growth episodes of three years over the period 1998-2013. In other words, even those firms which were classified as HGFs in one period were not experiencing high-growth for the majority of the observation period. Instead, high growth appears episodic rather than consistent. Episodes of high growth are also observed among firms of all ages although the probability of a firm experiencing its first high-growth episode declines with age. The probability of a firm experiencing a second high-growth episode also declines the longer the period since the first period. Half of all HGFs have a further episode of high-growth in the next growth period, but three periods later the repeat proportion is down to 10 per cent.

The potential for repeat high-growth episodes also suggests the limitations of some measures of the contribution of HGFs to job creation. Typically, this is based only on HGFs in the most recent or current period and leaves out of account entirely the contributions of HGFs in previous periods –i.e. firms which have previously recorded an HGF high-growth episode but are not currently HGFs. In 2010/2013, for example, first-time HGFs accounted for less than one-sixth of the jobs associated with HGFs, the other five-sixths were contributed by firms recording their second, or third (or more) HGF high-growth episode.

Such estimates may, however, also provide a misleading view of the jobs impact of HGFs due to potential multiplier and displacement effects.¹¹ Considering the externalities from high-growth firms on the growth of other local businesses suggests that for manufacturing firms a higher incidence rate of fast employment growth firms has an overall negative effect on the employment growth of other firms in the same industry-region (a competition-led crowding-out effect). However, this is balanced by an increase in demand for services and products by fast-growth firms, which has a positive market-creating effect on employment growth in the upstream sectors (suppliers). A different pattern is observed for services. Here, fast-growing services firms have a positive market-creating impact on employment growth within the same region and industry, and market-replacing effects from suppliers in the value chains. The scale of both effects, however, depends on the industrial characteristics of a locality, the position in the value chain, firm age and size and the degree of agglomeration.

6.2 Pathways to Productivity, Pathways to Growth

In another ERC research paper Peng et al. (2019) focus on the relationship between management practices and productivity in SMEs. They note that there has also been an increasing recognition of the importance of management knowledge, skills and the adoption of best management practices to productivity. However, whilst most existing research demonstrates the relationship between management practices and performance in large firms there is less understanding of how specific leadership and management skills relate to management practices and which practices improve firm performance in small firms. Smaller firms may experience greater constraints on their managerial capability. Consequently, fewer management practices are likely to be employed in small firms and also those firms that are closely held (i.e. those owned by just one or a few individuals, including family firms).

Peng et al. (2019) match data from a large-scale survey of SMEs' management skills and practices conducted in 2014 with longitudinal data on business performance from the Business Structure Database in 2017. This allows an analysis of the causal links between skills, management practices and firms' subsequent performance (Figure 1.10). Three key conclusions emerge:

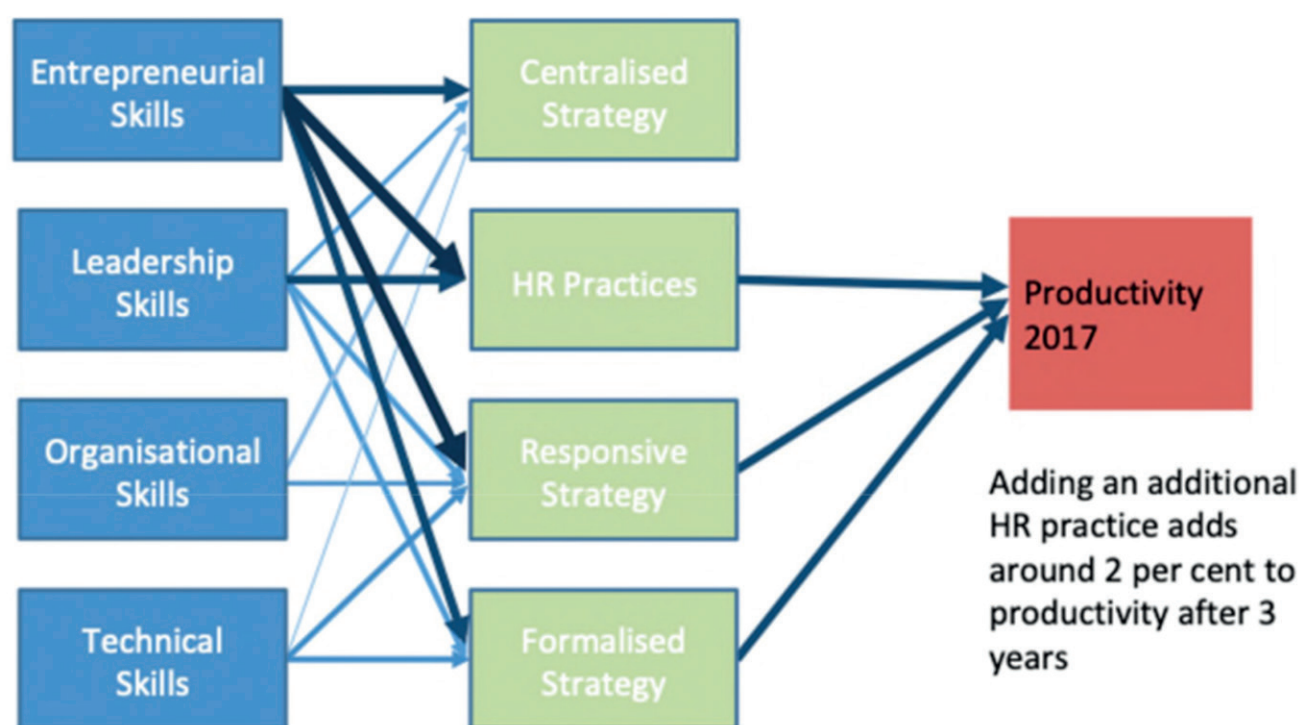
- The data confirms the importance of management practices for productivity such that an additional HR practice adds around 2% to productivity over three years.
- Management skills relate strongly to management practices with the significant relationships indicated in Figure 1.10.
- Strategic Practices prove most important for firms with fewer than 50 employees and that HR practices are more important for the performance of larger firms.

¹⁰ Anyadike-Danes, M and Hart, M (2019) 'Fecundity, fertility, survival and growth: high-growth firms in the UK and their contribution to job creation, a demographic perspective'. ERC Research Paper No 74

¹¹ Du, J and Vanino, E (2019) 'Fast-growth firms and their wider economic impact: UK evidence', ERC Research Paper 73.

This analysis emphasises the importance of entrepreneurial and leadership skills for small business owners. However, it also suggests the value of formalised and responsive strategies, which may not come naturally to entrepreneurs. Two policy implications follow. First, if a level of entrepreneurial and leadership skills are critical factors for productivity growth then these factors could be used to guide the allocation of public support. Secondly, assisting firms to develop formalised strategies – e.g. business planning – also seems a useful intervention to help firms boost productivity.

Figure 1.10: Linking Skills to Practices and Productivity in SMEs



Source: Peng et al (2019)

Resource constraints on small firms can also be financial and Fraser et al. (2018) consider how financial status in 2015 influences subsequent productivity.¹² Using data from the initial two waves of the Longitudinal Small Business Survey they consider the impact of four different financial statuses on productivity: successful seeker, failed seeker, self-sufficiency and discouraged borrower. Two mechanisms are considered:

- Financial status may influence firms' business strategies and so influence subsequent productivity, and;
- Financial status may limit firms' ability to capitalise on their business capabilities and so influence productivity.

Financial status proves important in shaping business strategies but not always in a predictable way. As expected, less resource constrained successful seekers are 46% more likely to increase workforce skills and 38% more likely to introduce new products, services and/or processes than self-sufficient firms. However, cash constrained discouraged borrowers are also 31% more likely to increase workforce skills and 39% more likely to introduce new products, services and/or processes than self-sufficient firms. Cash constrained failed seekers are also 45% more likely to increase workforce skills and 54% more likely to introduce new products, services and/or processes than self-sufficient firms.

¹² Fraser, S Peng, B Roper, S (2018) "Missing links: what mechanisms connect financial constraints to the performance of small firms". This research paper is available on request.

It seems that necessity spurs on financially constrained firms to implement business strategies. The effect of financial constraints on firms' ability to capitalise on business capabilities is more predictable with discouraged borrowers and failed seekers, both of which less likely to benefit significantly from having high business capabilities.

Interestingly, the analysis suggests that not all financial constraints have an equal impact on productivity outcomes. Financial constraints which result from discouraged borrowing have particularly large negative productivity impacts. This provides strong support both for initiatives designed to reduce any capital constraints on SMEs but also on-going policy initiatives around discouragement and the availability of alternative sources of finance.

Parallel research on innovation has shown that financial constraints may reduce levels of innovative activity. Recently published ERC research provides strong support for the value of public intervention in supporting firms' innovation activity leading to strong long-term growth.¹³ Collaboration with universities also has a significant effect on small firms' ability to introduce new to the market innovations.¹⁴ The value of such collaboration depends strongly, however, on the nature of the innovation which firms are undertaking. Recent ERC research has examined the nature of collaboration strategies for new to the firm and more radical new to the market innovation in UK professional services firms.¹⁵ The study suggests the superiority of very different collaboration strategies for radical and incremental innovators. High levels of radical innovation performance are associated with a single collaboration strategy: having few partners at the idea generation stage and no partners in commercialization. Incremental innovators benefit from strong complementarities, however, and a wide range of partnerships at both stages of the innovation process. The results reflect the higher risks and complexities of collaborating for radical innovation. The results also have important practical implications: firms can choose collaboration strategies that are most likely to increase their chances of success, rather than incurring costs, taking on risks, and accumulating numerous partnerships in pursuit of sub-optimal collaboration strategies.

Other recent ERC research has considered the routes through which public funding of R&D and innovation influence productivity.¹⁶ Does publicly support for R&D make it more likely that firms will introduce new product or service, process or organisational innovations? And, how do these contribute to subsequent growth and productivity change? Around 5-7 per cent of UK firms receive public grant support for their R&D or innovation activity often in addition to R&D tax credits. Both R&D supported with grants and wholly-privately funded R&D contribute to innovation, with the effect of publicly-supported R&D typically greater. The effects of product or service, process and organisational innovation on productivity and growth vary, however (Figure 1.11):

- Product or service innovation has positive effects on business growth but (short-term) negative effects on productivity;
- Process innovation has positive effects on both growth and productivity;
- Organisational innovation has a positive effect on productivity but a negative effect on growth.

In terms of public policy to support innovation this suggests a relationship between the types of innovation we support and the subsequent benefits: product/service innovation promotes growth while process innovation supports both growth and productivity improvement. The focus of current support in the UK is predominantly on novel product/service innovation with less focus on process improvement. This may need to be reconsidered given the current policy focus on productivity improvement.

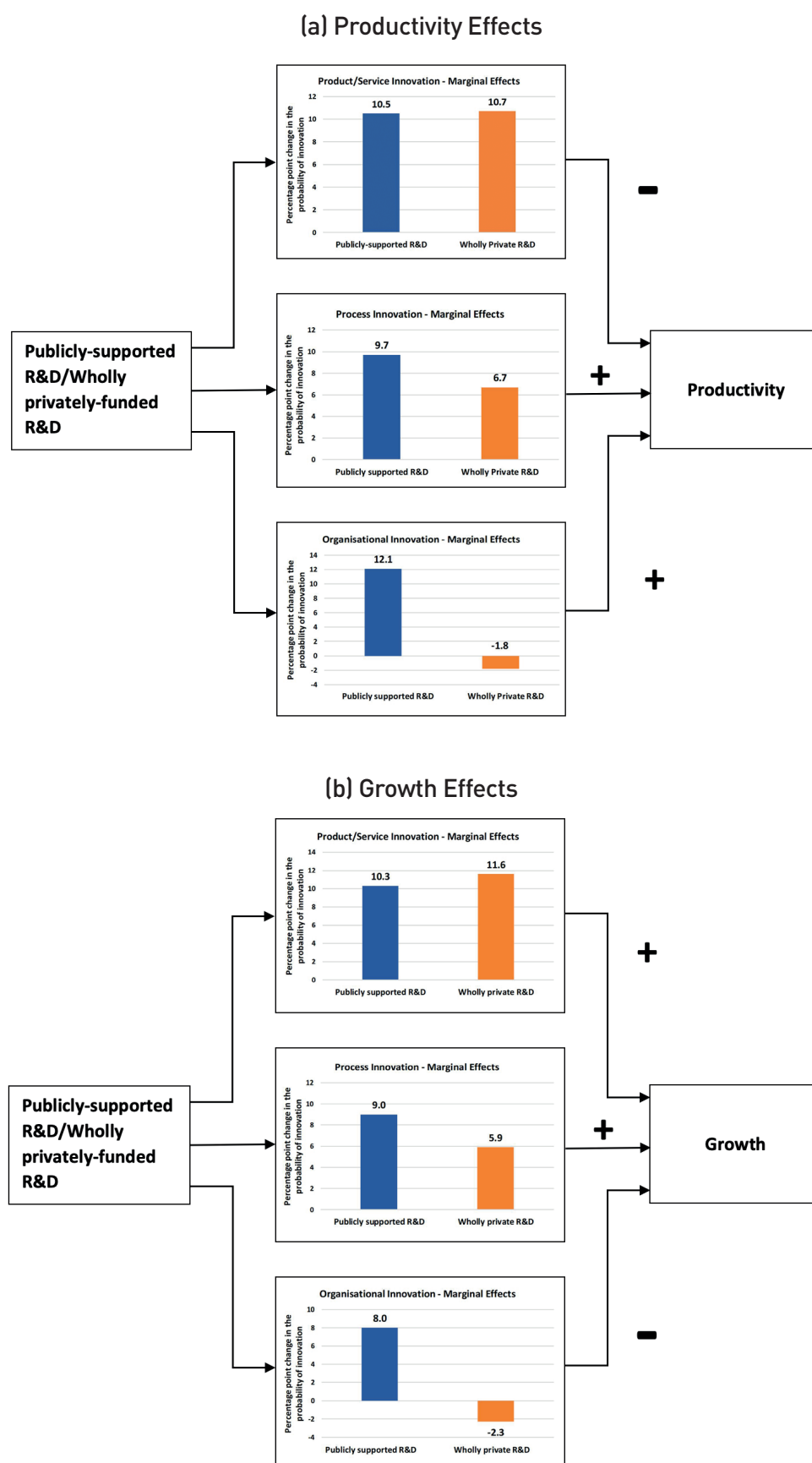
¹³ Vanino, E. Roper, S and Becker, B (2019). Assessing the business performance effects of receiving publicly-funded science, research and innovation grants, Research Policy,

¹⁴ Gkypali, A. Hewitt-Dundas, N and Roper, S (2019). Does learning from prior collaboration help firms to overcome the "two worlds" paradox in university-business collaboration? Research Policy, forthcoming.

¹⁵ Jibril, H Bourke, J and Roper, S (2019) 'Getting the right recipe: collaboration strategies for radical and incremental innovators in services', ERC Research Paper.

¹⁶ Turner, J Roper, S and Hewitt-Dundas, N (2019) 'Pathways to productivity, pathways to growth: Causal evidence from the UK Innovation Survey', ERC Research Paper.

Figure 1.11: Public and Privately-funded R&D, Innovation, Growth and Productivity



One aspect of process or operational improvement considered in other ERC research is the adoption of digital technologies. Focussing on micro-businesses (with 1-9 employees), this research focussed on the determinants of digital adoption.¹⁷ Four key conclusions emerge. First, there is strong evidence that growth ambition positively moderates the link between the expected returns from adoption and the adoption decision. The more ambitious the firm the more likely is adoption given any specific rate of return. The implication is that digital adoption can operate as a mechanism through which ambition translates into subsequent business performance. Second, network and collaborative linkages are strongly associated with digital adoption as suggested in epidemic models of technology diffusion. Third, there is strong evidence that firm-level characteristics impact digital adoption. Micro-businesses with stronger internal resources (business plans, training, external finance) are more likely to be digital innovators, potentially reinforcing their competitive advantages over more resource constrained competitors.

Fourth, and unexpectedly, prior adoption of digital technologies is negatively linked to subsequent adoption, while prior levels of sectoral adoption are positively linked to adoption. These findings may be linked to informational, competitive or supply-side effects. The results suggest the variety of factors which influence technology diffusion even in small micro-businesses. In policy terms while this presents a complex challenge, developing networking and information sharing mechanisms which can improve knowledge diffusion seem an obvious policy opportunity.

Other ERC research has this year examined the extent to which UK small firms have in place strategies to build resilience into their business. Part of a wider European study funded by the J P Morgan Foundation, this study investigates the extent to which women-owned businesses and ethnic minority businesses in London experience adversity and their resilience strategies.¹⁸ Four key findings emerge:

- Male- and female-led businesses were equally likely to have experienced an existential threat to the survival of their business in the past five years. However, male business owners judged the potential for future threats to be less significant than their female counterparts.
- Ethnic-led businesses were significantly more likely than non-ethnic-led businesses to have experienced a threat to the survival of their business. This effect was more evident for younger ethnic businesses and those located in low-income boroughs.
- Ethnic-minority business owners also judged the potential for future threats to be greater than their non-ethnic counterparts. Key issues included increased competition from new and existing sources, cost rises, problems with premises and changes in regulation or legislation.
- Psychological measures of personal resilience on average vary little between male and female business leaders and those from ethnic and non-ethnic groups. There is more significant variation within each group.

The findings emphasise differences in vulnerability (and perceived vulnerability) between different groups of firms. On-going activity in ERC is focussed on developing a toolkit which can help more vulnerable SMEs develop resilience strategies.

¹⁷ Bourke, J and Roper, S (2019) 'Industry 4.0 is coming: the role of ambition in digital adoption by micro-businesses', ERC Research Paper.

¹⁸ Wishart, M Roper, S and Hart, M (2018) 'Understanding business resilience among under-represented groups in London', ERC Report, December.

The State of Small Business Britain

Part B: A Tale of Two Sectors: Business Growth Metrics 2010-2018

Mark Hart, Neha Prashar, Karen Bonner and Anastasia Ri

A Tale of Two Sectors: Business Growth Metrics 2010-2018

1. Introduction

The UK Local Growth Dashboard is an annual report published at the time of the 'State of Small Business Britain' conference each year. The 2019 edition will be available on the ERC website (www.enterpriseresearch.ac.uk). Its purpose is to present a set of growth metrics for start-ups and existing firms across a range of sub-national geographies in the UK with a specific focus on each of the 38 English Local Enterprise Partnership (LEP) areas.

However, here we use the same set of business growth metrics to take a closer look at how two sectors have been performing in the post-recession period in the UK since 2010 namely **manufacturing** and **business and professional** services.¹

2. Data Source and Definitions

The dataset used in the production of the growth and start-up data is the Business Structure Database (BSD). This is a dataset produced by the Office of National Statistics (ONS) and is an annual snapshot of the Inter-Departmental Business Register (IDBR) which is a live register of data collected by HM Revenue and Customs via VAT and Pay as You Earn (PAYE) record.²

The IDBR data are complemented with data from ONS business surveys. If a business is liable for VAT (turnover exceeds the VAT threshold) and/or has at least one member of staff registered for the PAYE tax collection system, then the business will appear on the IDBR (and hence in the BSD). We use the firm-level BSD for firm growth rates, start-ups, and turnover (T/O) calculations. All the data contained in this section can be downloaded from the Data Hub on the ERC website (www.enterpriseresearch.ac.uk/).

The growth metrics we use are those found in the annual Local Growth Dashboard and are as follows³:

- 3-year survival rates of start-ups from 2010 onwards;
- Proportion of surviving start-ups that grow from <£500k to reach £1m+ T/O after 3 years;
- Proportion of £1-2m T/O businesses which grow to £3m+ T/O after 3 years;
- High-Growth Firm (OECD Employment-Based Definition) Incidence Rate – using both the traditional 20% threshold and the revised 10% threshold;
- Small High-Growth Incidence Rate – a metric adopting a methodology advocated to avoid the exclusion of firms with less than 10 employees from the OECD definition;
- Productivity Growth metric – a metric looking at firms who grow both in terms of jobs and revenues but have a faster rate of growth in revenues.

¹ Business & Professional Services defined as: J - Information and Communication; K - Financial and Insurance Activities; L - Real Estate Activities; M - Professional, Scientific and Technical Activities; N - Administrative and Support Service Activities.

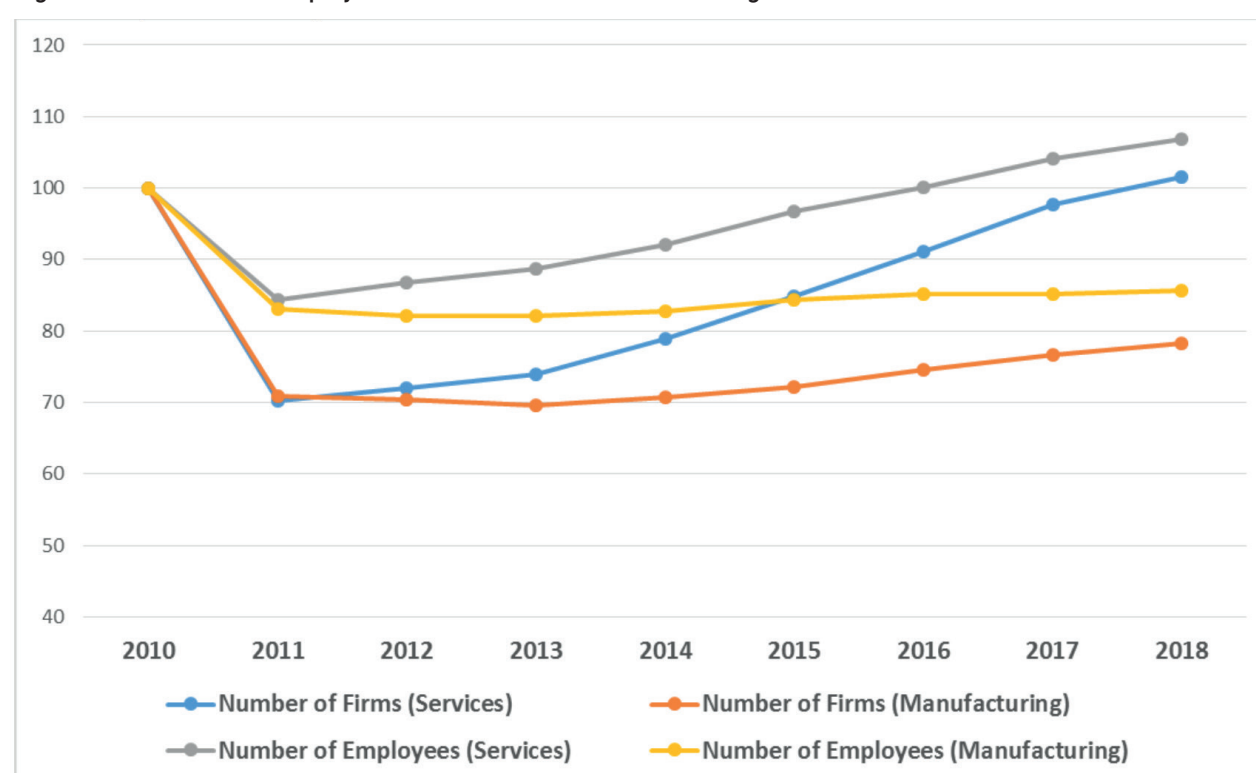
² Note: The use of these data does not imply the endorsement of the data owner or the UK Data Service at the UK Data Archive in relation to the interpretation or analysis of the data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

³ Metric Definitions: Start-up is defined as a UK-owned employer firm born in t0; Start-ups growing to £1m turnover refer to UK-owned firms born in t0 who survived to t+3 and whose turnover grew from <£500k to at least £1m in t+3; Firms growing to £3m turnover refer to UK-owned firms born prior to t0 that survived to t+3, whose turnover grew from £1-2m in t0 to at least £3m in t+3; High-Growth is defined by the OECD as annualised average growth in employment of 20% (or 10%) or more over a three year period (t0 to t+3) and restricted to a business having at least 10 employees in t0. Small High-Growth Firms: there has been growing criticism of the OECD HGF measure in recent years and in the US the Bureau of Labor Statistics (BLS) argued that the OECD measure was too narrow and excluded firms with less than ten employees in the first year of the three year growth period. The BLS developed an alternative measure which extended the definition of a high-growth firm to include firms with less than ten employees if the firm added eight or more employees during the three year growth period. Here we adopt this measure and refer to these as Small High Growth Firms (sHGFs).

3. Sector Trends 2010-2018

Since the Great Recession⁴, when both sectors experienced a rapid contraction, the rate of recovery has been somewhat different (Figure 2.1). While the size of the services sector has now bounced back to its pre-2010 levels in terms of number of firms and employment the manufacturing sector has failed to do so.

Figure 2.1: Number of Employees and Firms in the Manufacturing and Service Sectors 2010-2018 (Base =2010)



Source: ONS BSD (2010-18)

However, in the last 12 months the number of start-ups in both the manufacturing and services sector has fallen – by 1,357 and 31,379 respectively. Start-ups are an important component of a dynamic private sector and the sharp fall in both sectors since 2016 is a worrying new trend which will have knock-on effects in the next few years. The 3-year survival rates of start-ups are currently sitting at 56 per cent for both sectors.

The proportion of UK-owned start-ups that achieve this early indication of 'scale' is very small indeed with 2 per cent of surviving start-ups achieving this in services and 2.5% in manufacturing (2% nationally).

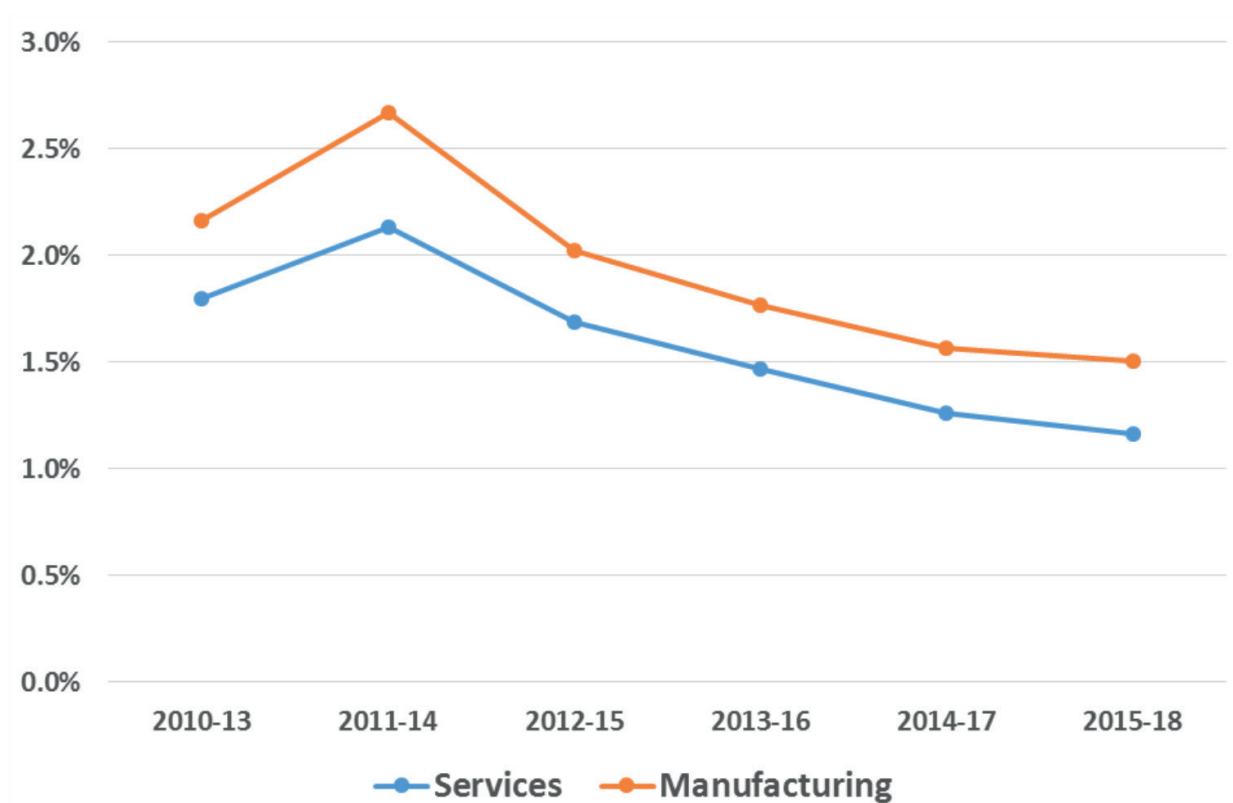
⁴ The BSD draws on the Inter Departmental Business Register (IDBR) which in turn relies heavily on data collected by Her Majesty's Revenue and Customs (mainly VAT and PAYE returns). The BSD itself consists of a series of annual snapshots (March each year) of the IDBR which we have linked together to form firm-level longitudinal records. The resulting dataset has some disadvantages. Although the IDBR is a 'live register' which is updated more or less continuously (and the data is then picked up by the BSD every March) there are lags in the data. For example, because the IDBR is a 'live' register the March snapshots are not a conventional time series – they do not necessarily record data which reports activity levels for March, they are data as at March. Further, that data at March each year can refer to a range of time periods over the previous years. We make the assumption that the nature of those lags are consistent in each annual snapshot. For this reason the actual position of the recession in the data is re-positioned slightly to the right.

4. Growth of Existing Businesses

Across the UK we observe that 5.4 per cent of existing firms with turnover of £1-2m per annum in the manufacturing sector in 2015 grew to at least £3m turnover in 2018 which is significantly lower than that observed for surviving business in the service sector (9.1%). The comparable figure for the whole of the private sector was 7.4 per cent in 2015-18.

Turning our attention to the three standard high-growth firm metrics used by the OECD the trends for manufacturing and services are remarkably similar since 2010 even if there is a difference in levels. First, Figure 2.2 shows that there has been a decline in the proportion of all firms that are achieving high-growth in both sectors since the 2011-14 period: 1.2 per cent for services and 1.5% for manufacturing.

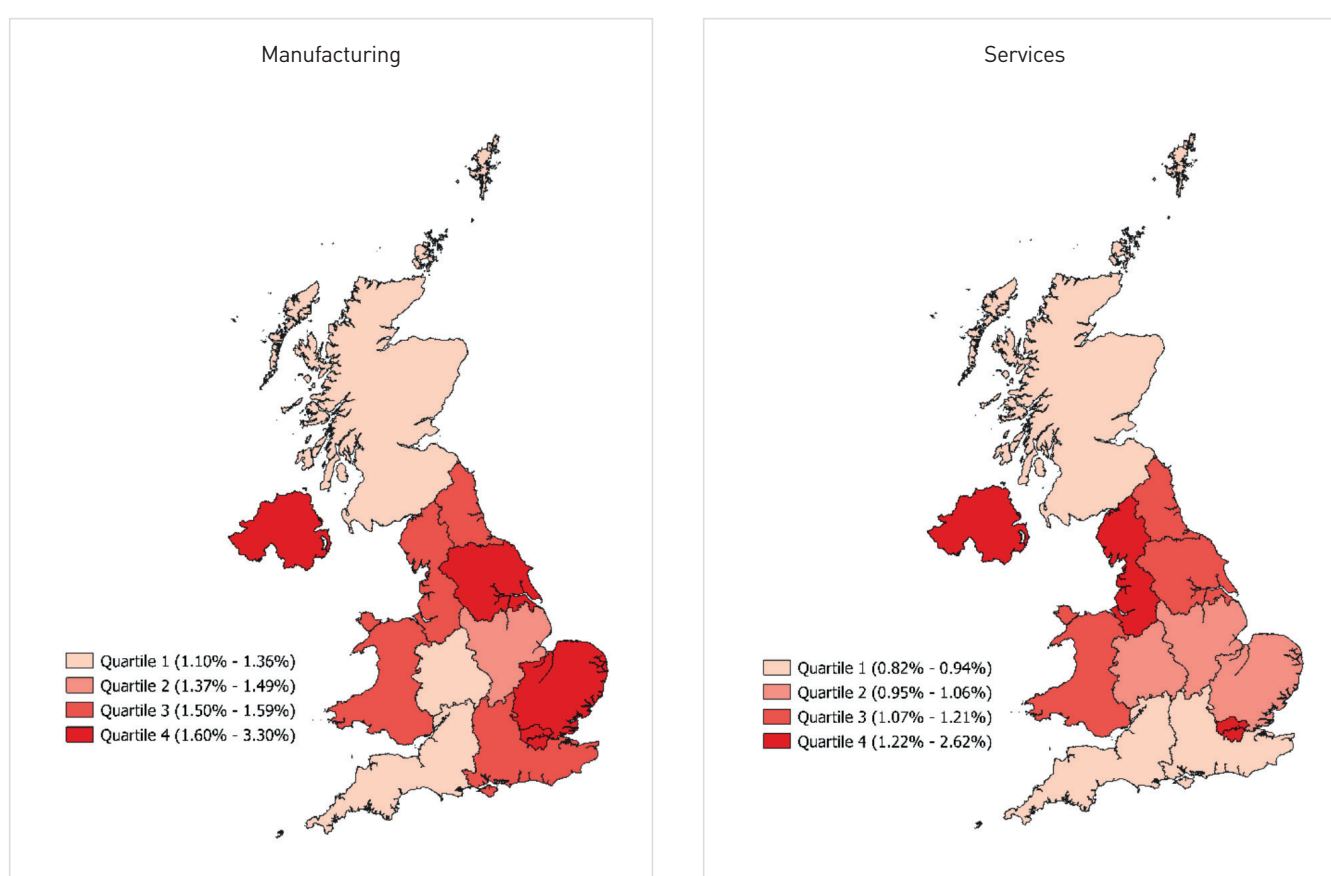
Figure 2.2: Proportion of all Firms who Achieved High-Growth
– Including Micro-businesses with Less Than 10 Employees.



Source: ONS BSD (2010-18)

Figure 2.3 presents the same data for all the English regions and Home Nations for the 2015-18 period. In the context of fewer micro and small businesses registering rapid growth over time there are some marked spatial patterns for both sectors in this most recent 3-year period. Both sectors in Scotland and the South West perform relatively badly on this metric as does the Midlands and especially the West Midlands. Northern Ireland performs well on this business growth metric for both manufacturing and services. Perhaps surprisingly, there is a clear north-south divide in the services sector with south outside London performing relatively weakly.

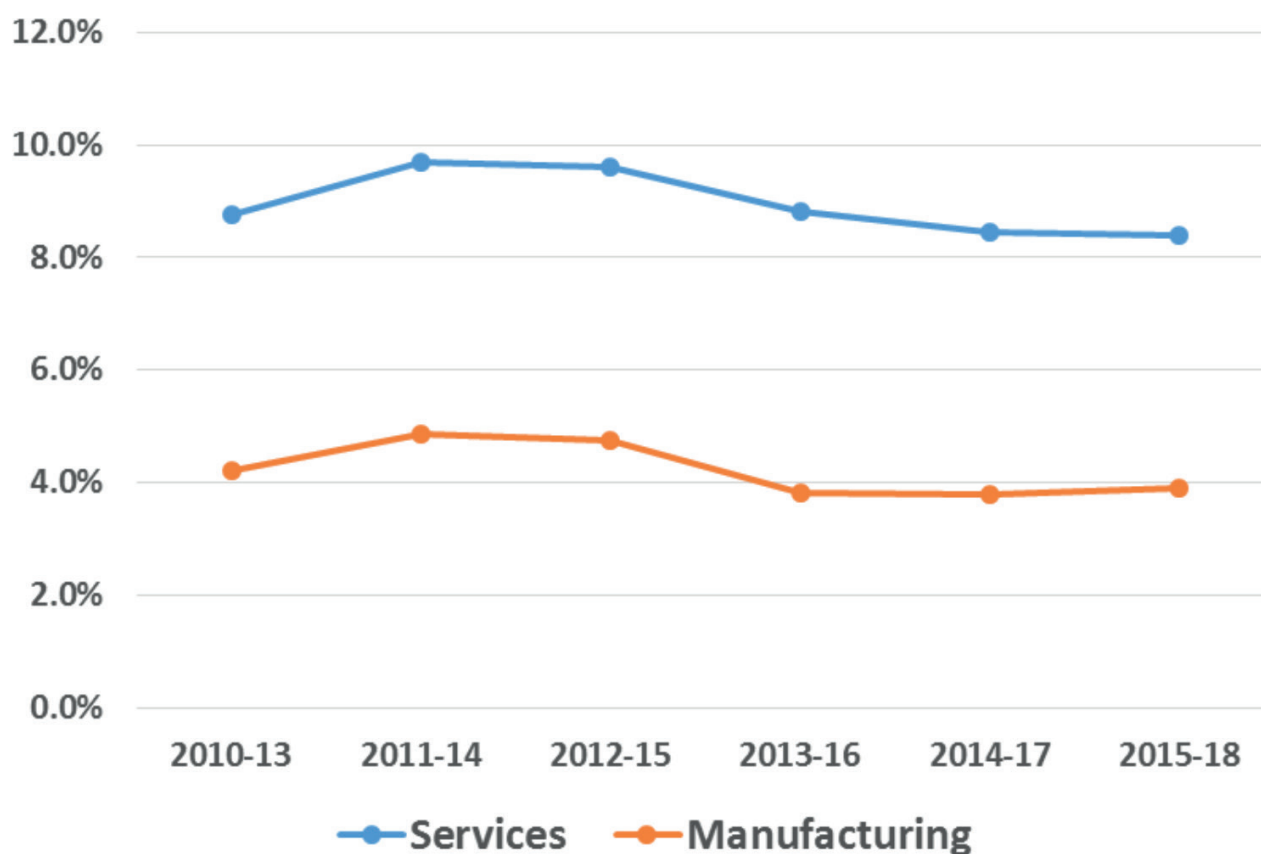
Figure 2.3: Proportion of All Firms who Achieved High-Growth (Including Micro-businesses with Less Than 10 Employees) by Nation and Region (2015-2018)



Source: ONS BSD (2015-18)

Second, the well-known OECD High-Growth metric (employment-based) for all firms with at least 10 employees is shown in Figure 2.4. Only 3.9 per cent of manufacturing firms were classified as high-growth in 2015-18 compared to 8.4 per cent of firms in the services sector. The incidence for the whole of the private sector was 6.2 per cent. Again these incidence rates have been falling in both sectors since 2014 but seem to have stabilised in the last two periods.

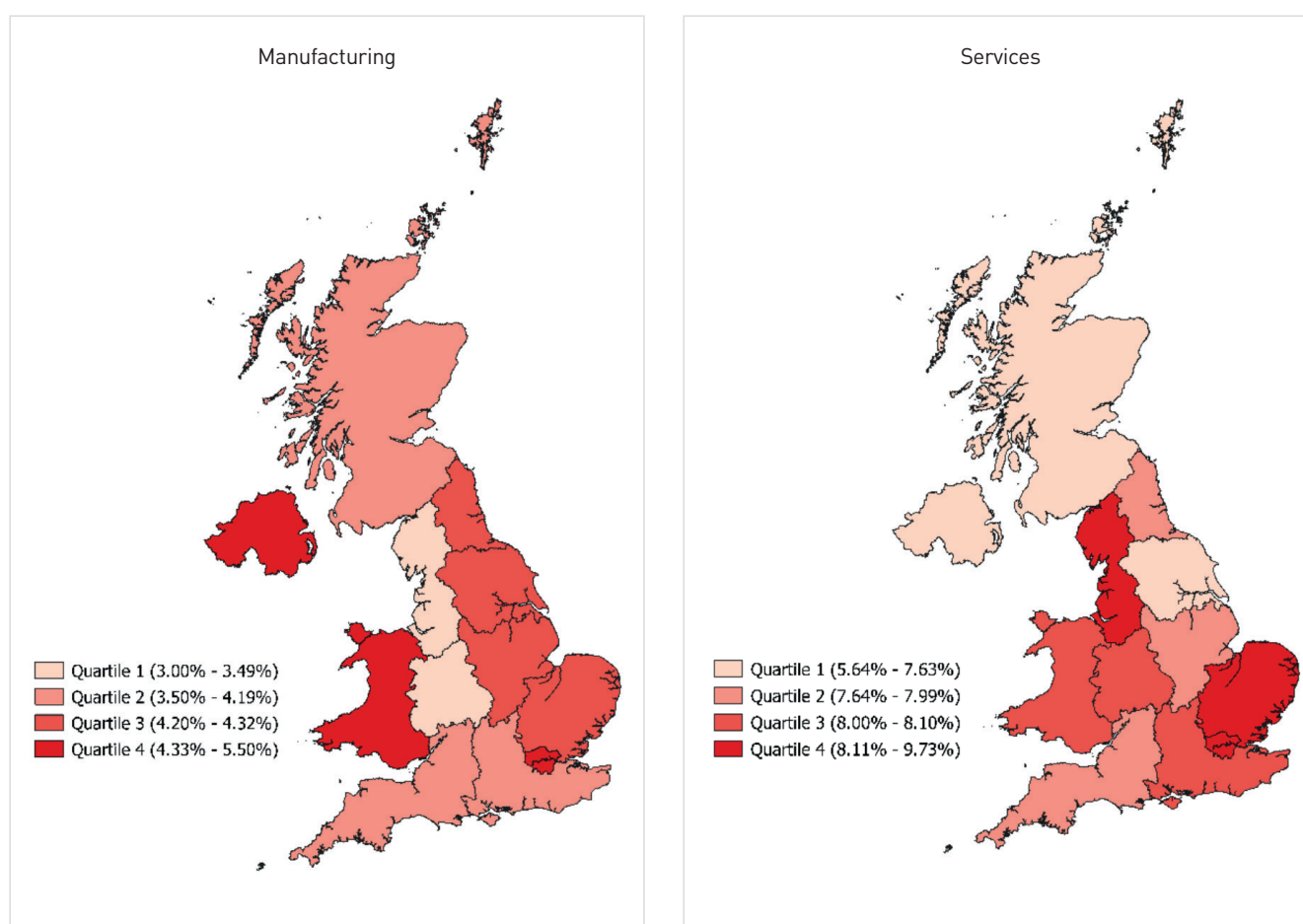
Figure 2.4: OECD High-Growth Firm Incidence Rate (20% Threshold)



Source: ONS BSD (2010-18)

Figure 2.5 presents the same data for all the English regions and Home Nations for the 2015-18 period. With respect to manufacturing, the West Midlands and the North West have relatively low proportions of what the OECD refers to as high-growth firms (HGFs) and stand in marked contrast to London, Wales and Northern Ireland where there are above average proportions. These two Home Nations, in marked contrast to Scotland, perform relatively well on this business growth metric. Turning to services, Scotland, Northern Ireland and the Yorkshire and Humberside region are below average while London and the South East as well as parts of the North West region perform relatively well.

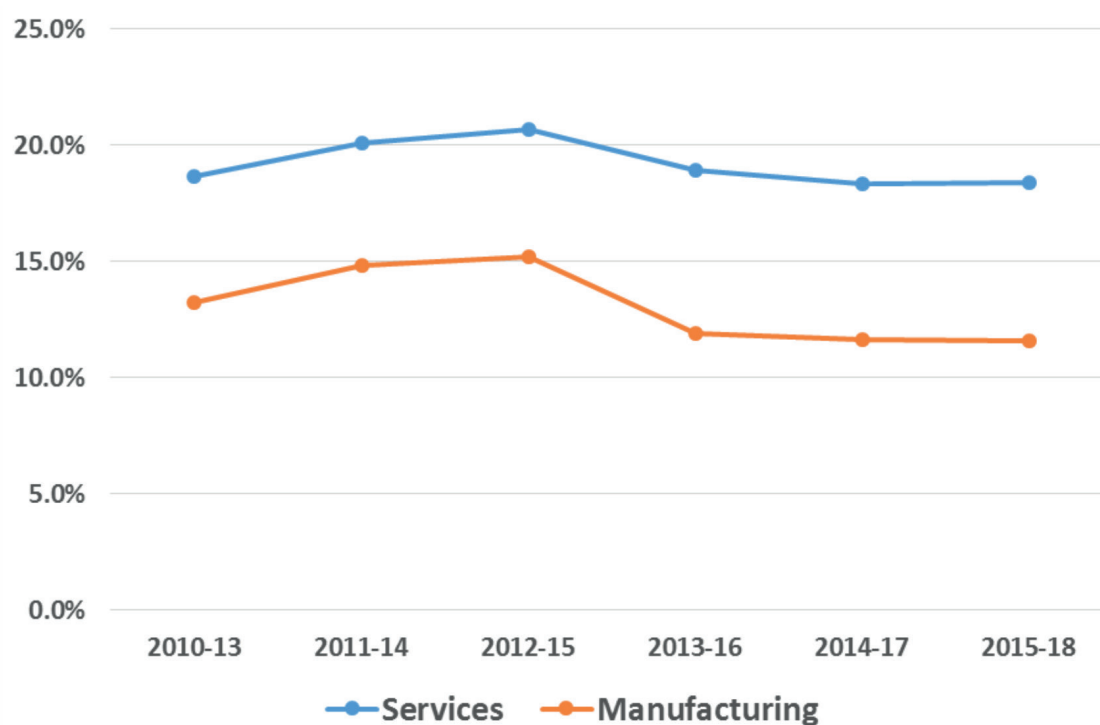
Figure 2.5: OECD High-Growth Firm Incidence Rate (20% Threshold): 2015-2018



Source: ONS BSD (2015-18)

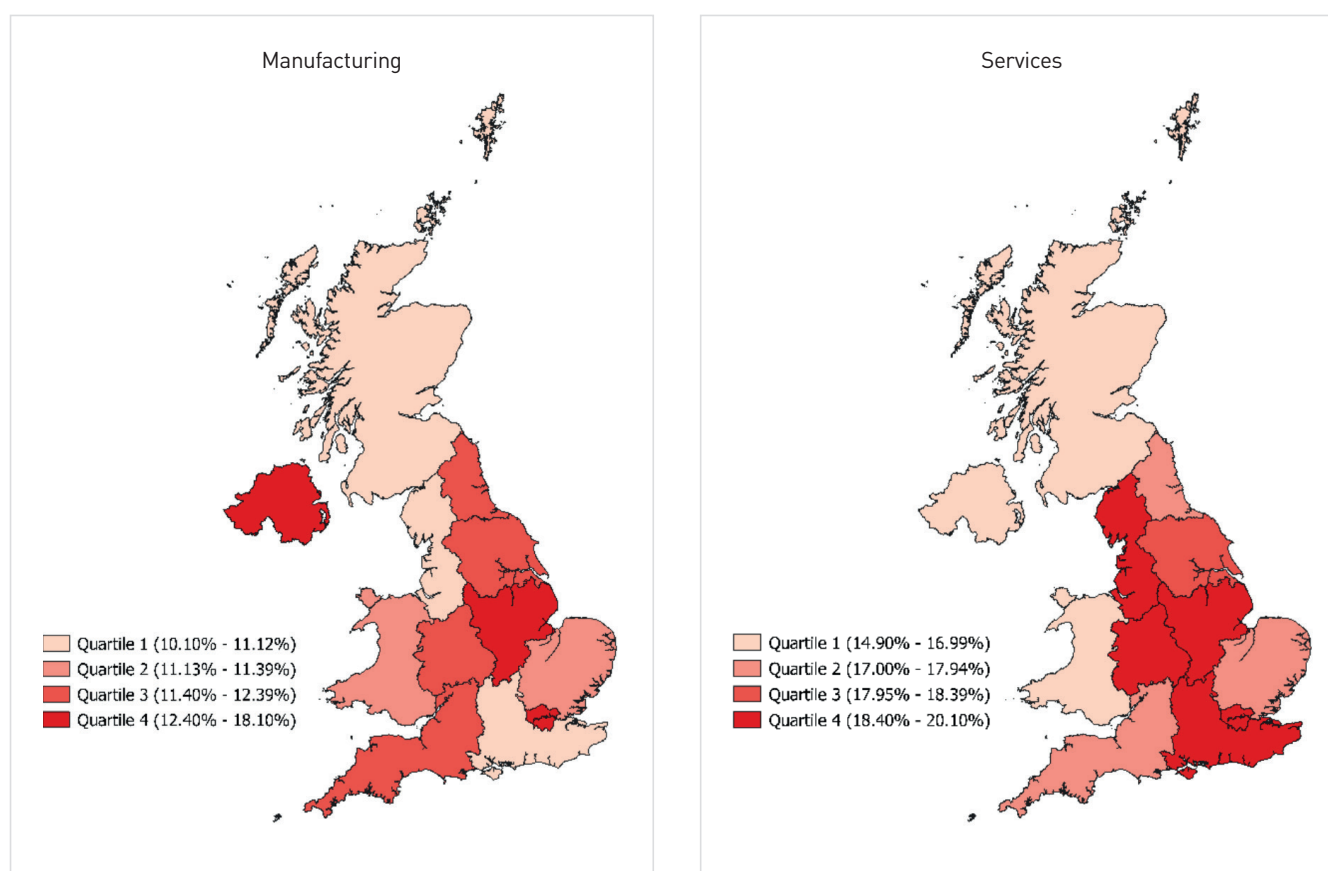
Third, using the now more commonly used 10 per cent annual growth threshold over the three years, Figure 2.6 shows a similar pattern with the incidence rate of manufacturing firms with at least 10 employees lower than for the services sector: 11.6 per cent compared to 18.4 per cent respectively.

Figure 2.6: OECD High-Growth Firm Incidence Rate (10% Threshold)



Source: ONS BSD (2010-2018)

Figure 2.7: OECD High-Growth Firm Incidence Rate (10% Threshold): 2015-2018



Source: ONS BSD (2015-2018)

Relaxing the OECD HGF definition to a 10 per cent threshold does not change the national/regional patterns very much at all for the two sectors (Figure 2.7). Business growth is again strong in Northern Ireland in manufacturing but not so much in the services sector. Scotland exhibits a below national average incidence rate of HGFs in both manufacturing and services. London has above average incidence rates on this HGF definition and the Midlands performs more strongly on this metric, especially the East Midlands.

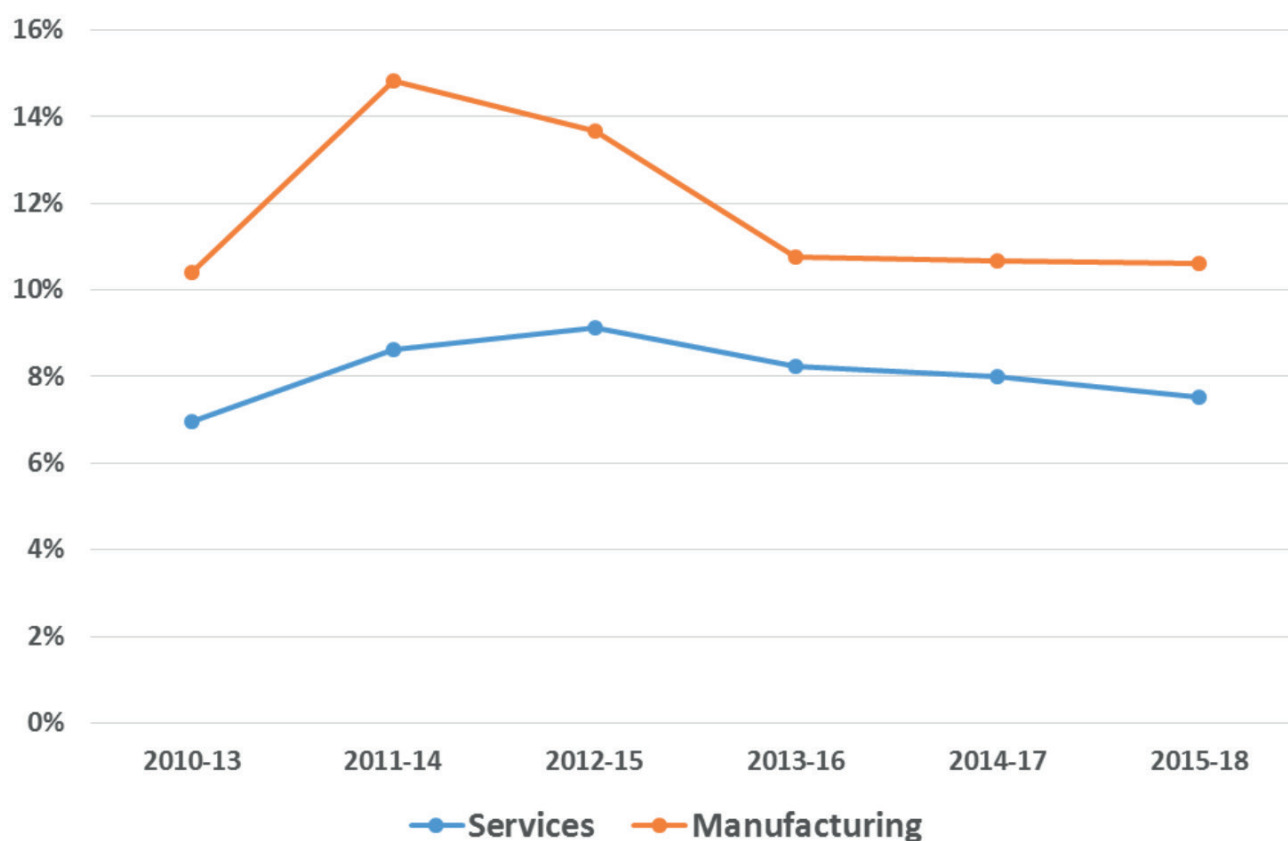
The final business growth metric we look at relates to a proxy measure of productivity (turnover per employee). We devised this growth metric for two reasons. First, our previous research showed that there was a very poor correlation between jobs growth, increases in revenues and productivity gains. Indeed, we found that only 5% of the OECD's high-growth firms (employment definition) recorded productivity growth in the period 2008-2015.⁵ Second, the current 'Long Tail Productivity Review'⁶ prompted us to probe and extend the evidence base using the datasets we have access to on the population of employer enterprises rather than the sole reliance on ONS survey data which normally excludes the smaller businesses.

⁵ British Business Bank (2018) "Small Business Finance Markets Report", February 2018.
<https://www.british-business-bank.co.uk/research/small-business-finance-markets-report-2018/>

⁶ BEIS business productivity review
(https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/712342/Business_Productivity_Review_call_for_evidence_.pdf)

Figure 2.8 shows that 10.6 per cent of all manufacturing businesses in the UK achieved positive productivity gains (revenue per employee) while still increasing jobs over the period 2015-2018 compared to 7.5 per cent in the services sector. For manufacturing this represent a fall of 4 percentage points since 2011-14 and one percentage point for services over the same period.

Figure 2.8: Proportion of Firms with Positive Productivity Growth
(Where Turnover and Employment Both Increased but Turnover Grew at a Faster Rate)



Source: ONS BSD (2010-2018)

5. Business Growth in the Automotive Sector

In recent months the state of the automotive sector⁷ in the UK has been the focus of much analysis and commentary in the context of Brexit. Here we set out new analysis on the state of the sector by using the ERC's longitudinal firm-level dataset, based on the ONS BSD, to set out some of our usual business growth metrics.⁸

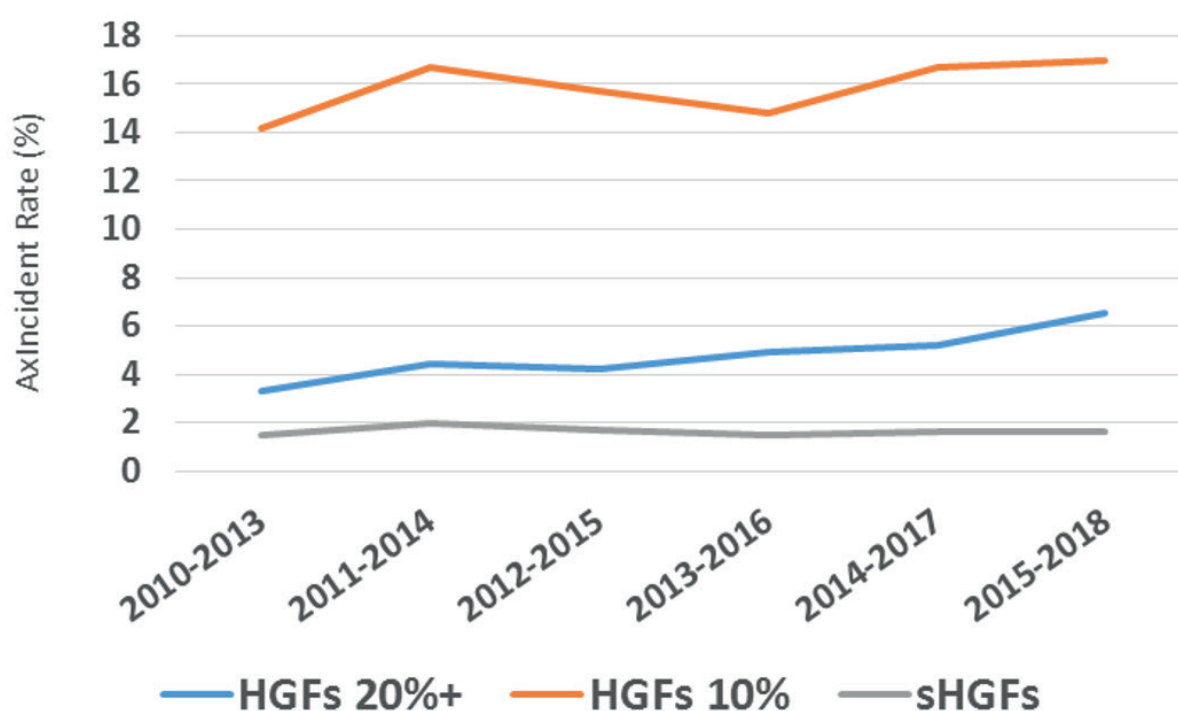
By way of context there are now 162,696 employees in the automotive sector in 2018 which reflects a number of years of steady growth since the Great Recession and it is now back at levels before its decline of around 17%. A third of the employment is in businesses headquartered in the West Midlands with a further 11 per cent in the East Midlands. There are now 4,139 firms in the sector ranging from household OEMs to large numbers of SMEs. This does represent a decrease of around 1,600 firms since pre-recession but is still the highest number since 2011 when we have seen increasing numbers of firms years on year in that period.

⁷ Defined as: Division 29 of Section C - Manufacture of motor vehicles, trailers and semi-trailers; and Class 30.91 - Manufacture of motorcycles (SIC 2007).

⁸ It is important to remember that there are lags in the ONS BSD dataset available to researchers so the 2016-18 period we report below will not accurately reflect a post-referendum period.

The three main business growth metrics (i.e., OCED HGFs – 20% and 10% annual employment growth threshold over the three year period plus the variant to include micro-businesses) show a more positive trend in recent years (Figure 2.9). The proportion of businesses with 10 or more employees that can be categorised as high-growth (20% annual threshold) has doubled between 2010-13 and 2015-18 (3.3% to 6.5%). There has also been a much more modest increase in the number of HGFs defined using the broader 10 per cent annual growth threshold and for sHGFs there has been no change over this period.

Figure 2.9: High-Growth Firm Incidence Rates in the Automotive Sector (2010-2018)



Source: ONS BSD (2010-18)

Post-recession 2017 recorded the highest number of start-ups in the automotive sector (539) but this fell back sharply in 2018 to 392. Similarly, when looking at “alternative” business growth metrics based on year-to-year growth in employment, turnover and productivity, we can start to see a downward trend between 2017 and 2018:

- Number of automotive firms (all sizes) with more than 10% growth in employment is down from 28.7% in 2012 to 23% in 2018 (from 28.2% to 20.5% in West Midlands);
- Number of automotive firms (all sizes) with more than 10% growth in turnover is down from 14.9% in 2017 to 10.6% in 2018;
- Number of automotive firms (all sizes) with more than 10% growth in labour productivity (i.e., turnover per employee) is down from 17.2% in 2017 to 12.9% in 2018.

6. Summary

The message for an examination of the trends in business growth metrics in the post-2010 period are clear and worrying in the current climate of political and economic uncertainty. While there has been some recovery from the losses of the Great Recession the manufacturing sector has not performed well in recent years. Numbers of start-ups have fallen in the last 12 months and the proportion of fast-growing firms, using a range of international metrics, is in decline and well below those observed in the business and professional services sector and indeed in the private sector overall. The proportion of businesses with positive productivity growth in the sector is above average compared to services and the rest of the private sector nationally, but has been declining in the last five years.

Although there is evidence of fast-growth in the sector with the incidence rates of HGFs increasing in recent years especially for the traditional 20 per cent threshold of annual employment growth there are a set of metrics which show decline between 2017 and 2018 which does not bode well for the sector and is perhaps beginning to pick up the effects of the post-referendum environment for the sector.

However, while the services sector has grown well since 2010, there are clear signs that fewer businesses are now achieving the minimum thresholds of fast-growth for the business growth metrics we have analysed than in the immediate recovery period after the recession.

Looking across the UK we do observe some important national/regional contrasts in these business growth metrics with, for example, more Northern Ireland manufacturing businesses recording faster growth in marked contrast to Scotland. The same is true to a lesser extent when we compare Wales with Scotland. Fewer business in the manufacturing sector in the West Midlands are achieving rapid growth compared to other parts of the UK.

When we look at services London stands out as having higher proportions of businesses achieving faster-growth while once again Scotland performs relatively badly compared to other parts of the UK, irrespective of which business growth metric is examined. Interestingly, when we use the definition of high-growth which includes micro-businesses there is a clear core-periphery pattern with the more peripheral nations and regions performing relatively well compared to more core or southern regions with, of course, the exception of London.

The ERC research team are currently concluding a study for Scottish Enterprise into the various explanations which may be driving these trends and spatial patterns. A number of plausible reasons have been advanced to explain what might be happening in Scotland⁹:

- The Scottish independence referendum in 2014 which created some uncertainty and investment caution.
- The oil and gas recession following a dramatic drop in the price of oil from \$112pb in June 2014 to \$36pb in January 2016¹⁰ which affected economic activity in the Aberdeen area and Shetlands in particular, but which was also visible in a slower pace of growth in business starts in the east of Scotland than in the west of Scotland. Before this period, Aberdeen was a start-up hotspot in Scotland.
- The UK Brexit referendum in 2016 and the associated continuing uncertainty made Scots even more cautious than they otherwise would be, especially as 2 in 3 Scots voted to stay in and feared the consequences of Brexit rather than, as in England, the majority welcomed or ignored it.

There is some empirical evidence to support these possible reasons. Entrepreneurial growth is a function of overall business activity in a region and where this is subdued due to consumer and business caution, entrepreneurial growth will be lower.¹¹ The Scots were much slower to start and grow businesses than the English were after the Great Recession, and in the north- east and more rural areas of Scotland, start-up rates declined against the trend across the UK.

⁹ See Hart, M; Bonner, K; Prashar, N; Ri, A and Roper, S (2019) Analysis and Benchmarking of Business High-Growth Performance in Scotland, Enterprise Research Centre prepared for Scottish Enterprise (forthcoming).

¹⁰ <https://www.macrotrends.net/1369/crude-oil-price-history-chart>

¹¹ Levie, J., Mwaura, S., Sahasranamam, S., Hart, M., Prashar, N. and Bonner, K. (2018). Entrepreneurial Ecosystem – Benchmark Research Final Report. Prepared for Entrepreneurship, Values-based Business and Small Business Policy, The Scottish Government. May. 70pp

The State of Small Business Britain

Part C: Research Focus: The Mittelstand Mindset for a Digital Age

Stephen Roper and Jane Bourke

Research focus: The Mittelstand Mindset for a Digital Age

1. Introduction

Previous ERC research projects have focused on ambition and innovation in smaller UK companies. In this section, reflecting the sectoral focus of the State of Small Business Britain Conference, we report on an on-going project focussed on automotive SMEs in the UK and German Mittelstand.¹

German Mittelstand companies are widely admired for their innovation, operational excellence and high productivity. The independence and 'familiness' of Mittelstand firms also means that their leaders have a uniquely strong identification with their firm. This leads to a strong focus on the long-term development of the firm² – the Mittelstand Mindset – combining an intensity of commitment with a focus on excellence and continual improvement. Balancing their desire for independence may, however, lead Mittelstand firms to eschew the use of external capital and collaboration with external innovation partners. Both may limit the internal resources available to drive growth.

Previous research on Mittelstand firms in Germany has emphasised their focus on innovation, with one study suggesting that innovation investment in Mittelstand firms is twice that in other German companies.³ Other studies have suggested that regions which have more Mittelstand companies also have a higher level of patent activity with associated benefits for local productivity.⁴

International admiration for Mittelstand firms contrasts with some negative German commentary which argues that the Mittelstand style of entrepreneurship compares poorly to that of Silicon Valley, which is defined by high growth rates, high-tech innovation and venture capital funding. The most recent contribution to this debate concludes however that: 'the Mittelstand is an excellent example of every day entrepreneurship, demonstrating how entrepreneurship that builds on a sense of responsibility and solidarity can shape an economy and society and contributes to its world standing. What remains to be seen is whether and to what extent the ongoing digitisation of our economy and society will undermine that typical Mittelstand mindset'.⁵

Indeed, both Mittelstand and non-Mittelstand firms face new challenges from digitisation as we move towards Industry 4.0. Taking full advantage of the benefits of digitisation will require innovation in production and management processes, new business models and skill sets. How are Mittelstand firms in the Germany and the UK approaching these challenges?

Here, we present some initial findings from a project comparing the 'Mittelstand Mindset' in a group of independent small-to-medium firms in the automotive manufacturing sector in the UK and Germany and explore their engagement with the digital economy.

Box 1.1: Surveying Automotive Manufacturing Mittelstand Firms in the UK and Germany

We are conducting a telephone survey of a representative sample of firms with 5-249 employees in automotive manufacturing in the UK and Germany. Firms are included in the survey only if they were independent firms (not subsidiaries) and had been established for three years or more. Survey fieldwork commenced in April 2019. It has proved more difficult than anticipated to persuade German companies to participate in a voluntary survey and to date information has been collected from 39 German automotive firms and 86 UK firms. Survey questions focussed on the elements of the Mittelstand Mindset identified in De Massis et al. (2018) and firms' engagement with digitalisation in Icks et al. 2018.⁶

¹ This project is being conducted in partnership with the High Value Manufacturing Catapult. The views expressed in this report are those of the authors alone.

² Habbershon, T. G., and M. L. Williams. 1999. A resource-based frame- work for assessing the strategic advantages of family firms. *Family Business Review* 12 (1): 1–25.

³ Simon, H. 2007. *Hidden champions des 21. Jahrhunderts*. Frankfurt, Germany: Campus Verlag.

⁴ Berlemann, M., and V. Jahn. 2016. Regional importance of Mittelstand firms and innovation performance. *Regional Studies* 50 (11): 1819–33.

⁵ Pahnke, A. and F. Welter (2019). "The German Mittelstand: antithesis to Silicon Valley entrepreneurship?" *Small Business Economics* 52(2): 345–358.

⁶ De Massis, A.; D. Audretsch; L. Uhlaner; and N. Kammerlander. 2018. Innovation with Limited Resources: Management Lessons from the German Mittelstand. *Journal of Product Innovation Management* 35:125–146. Icks, A.; C. Schroder; S. Brink; C. Dienes; and S. Schneck. 2018. Business process digitisation of SMEs in the manufacturing sector. In *IfM Materialien* Bonn.

2. The Mittelstand Mindset and Industry 4.0

German Mittelstand firms are globally recognised for their innovation, especially regarding product, process, and service innovation. Recent studies have looked at resource use in these firms and argue that there are seven key traits which combine to support innovation in these firms (Figure 1)⁷. These are:

- **A niche or 'super niche' focus** on achieving global market leadership in a tightly defined market segment. Market leadership is typically based on technological superiority and product quality.
- **Firms' globalisation strategy** accompanies these niche market strategies. This prioritises global export sales, a strategy which mitigates market weakness in any specific geography.
- **Customer collaboration** is seen as a key priority in product development. Customer relations are seen as a key priority by Mittelstand leaders often based on personal relationships. Mittelstand firms have a strong preference for selling direct to customers, rarely using third-parties.
- **A preference for self-financing** – related to the desire for independence, this focuses firms on organic growth funded from previous profits. This may limit firms' ability to invest or respond to significant new market opportunities.
- **A long-run mindset** may require lower short-term returns from investments and be consistent with a strategy of incremental improvement. It may also imply conservatism which may be less consistent with the rapid pace of change arising from digitalisation.
- **Superior employee relations** stem from Mittelstand firms' 'familiness' and desire to provide long-term employment and training opportunities.
- **Community embeddedness** – Mittelstand firms are often an important and long-established employer in their local community. Commitment to the development of the firm is often allied with a commitment to local development.

Taken together it is argued that these strategic traits offset Mittelstand firms' lack of financial and human resources and support long-term innovation. These studies omit any significant consideration of collaboration in innovation and/or supply chain issues which may also be important factors. Are these traits of German Mittelstand firms also evident in similar UK companies and how they are likely to influence competitiveness in an era dominated by digitisation?

Evidence on digitisation by UK firms remains limited but a recent study of digitisation by SMEs in Germany stresses the rapidly changing nature of the business environment and suggests that in the German context⁸:

- **There is further potential to establish data-based connections to other firms** - more than three in four companies digitised their business processes between departments within the firm.
- **Digitisation is rarely used for the development of new business models** - almost two thirds of the firms intend to optimise their production and business processes through digitisation. One fifth of the companies already produce smart and connected products.
- **Technical obstacles do not represent major challenges** - firms report that they face organisational challenges when it comes to digitising their internal business processes. Hence, to fully exploit the potential of digitisation, it is necessary to develop organisational innovations.
- **Small businesses overestimate their degree of digitisation** - almost one third of the respondents feel (very) well positioned in the digitisation process. This evaluation might be misleading: small businesses are comparatively less involved in exchanging data between their own departments and the departments of other companies.

How evident are these challenges in Mittelstand firms in Germany and the UK?

⁷ De Massis, A.; D. Audretsch; L. Uhlaner; and N. Kammerlander. 2018. Innovation with Limited Resources: Management Lessons from the German Mittelstand. *Journal of Product Innovation Management* 35:125-146.

⁸ Icks, A.; C. Schroder; S. Brink; C. Dienes; and S. Schneck. 2018. Business process digitisation of SMEs in the manufacturing sector. In *IfM Materialien Bonn*.

3. Profiling UK and German Mittelstand Firms in the Automotive Sector

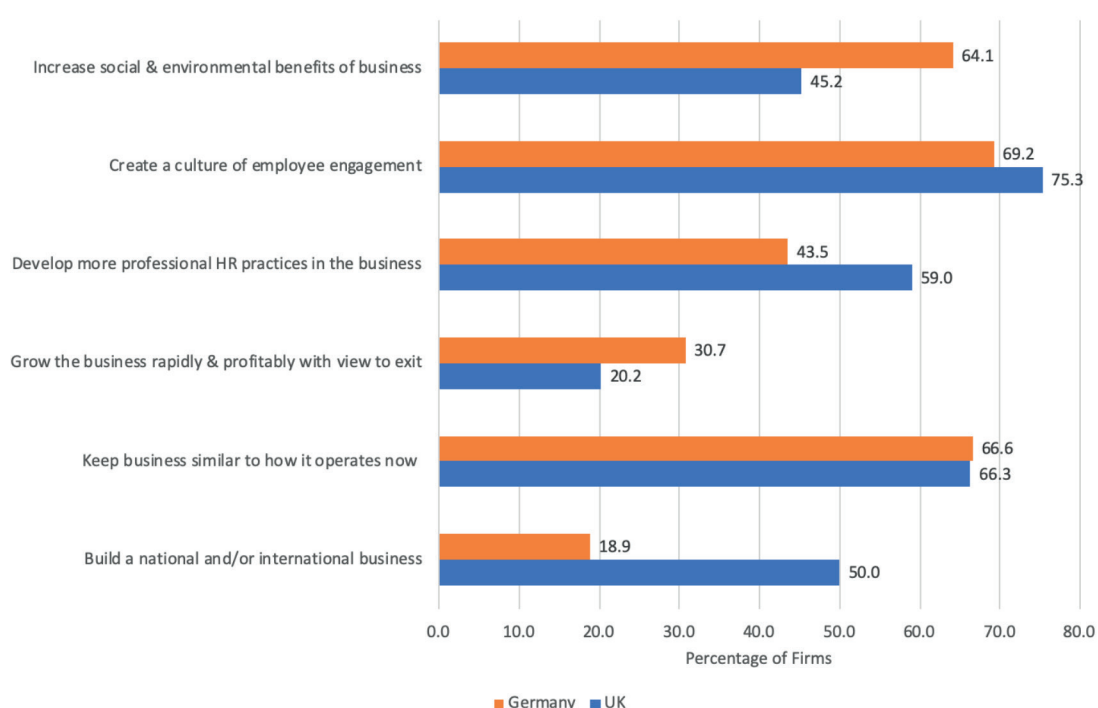
In this section we provide an overview of the UK and German respondents to our survey at this interim point in the study. The focus is on the characteristics of respondent businesses and their broad strategic orientation. On average, UK respondents were smaller than their German counterparts in terms of employment and turnover but had remarkably similar mean levels of sales per employee, an indicator of productivity (Table 3.1). As we might anticipate, German respondents were marginally more export-oriented than their UK counterparts and were, on average, significantly older. 24 per cent of firms' leadership team were female in the UK compared to only 10.5 per cent in Germany. Growth rates were broadly similar across both groups of respondents (Table 3.1).

Table 3.1: Characteristics of UK and German Automotive Respondents

	UK N=86	Germany N=39
Employment	24.9	38.7
Turnover (£m pa)	3.6	4.9
Sales per employee (mean)	140.1	140.0
Export share of sales (%)	15.2	20.0
Business age	31.9	56.6
Female leadership (%)	24.0	10.5
Employment growth (10 plus, mean %pa)	9.6	7.7
Turnover growth (10 plus, mean %pa)	6.0	6.6

Previous studies have strongly linked owner-managers' growth ambition to the subsequent growth and performance of the firm.⁹ Looking at respondents' aspirations for their business over the next three years we consider the proportion of respondents ranking each aspiration as 'important' or 'very important'. UK business leaders prioritised building a national or international business, while German business leaders were more likely to stress increasing the social and environmental benefits of the business (Figure 3.2). Perhaps surprisingly, given the much-discussed long-term emphasis of Mittelstand firms, German respondents were more likely to express a desire to 'grow the business... with a view to exit' than UK firms.

Figure 3.2: Business Objectives of Automotive SMEs Over the Next Three Years: By Country

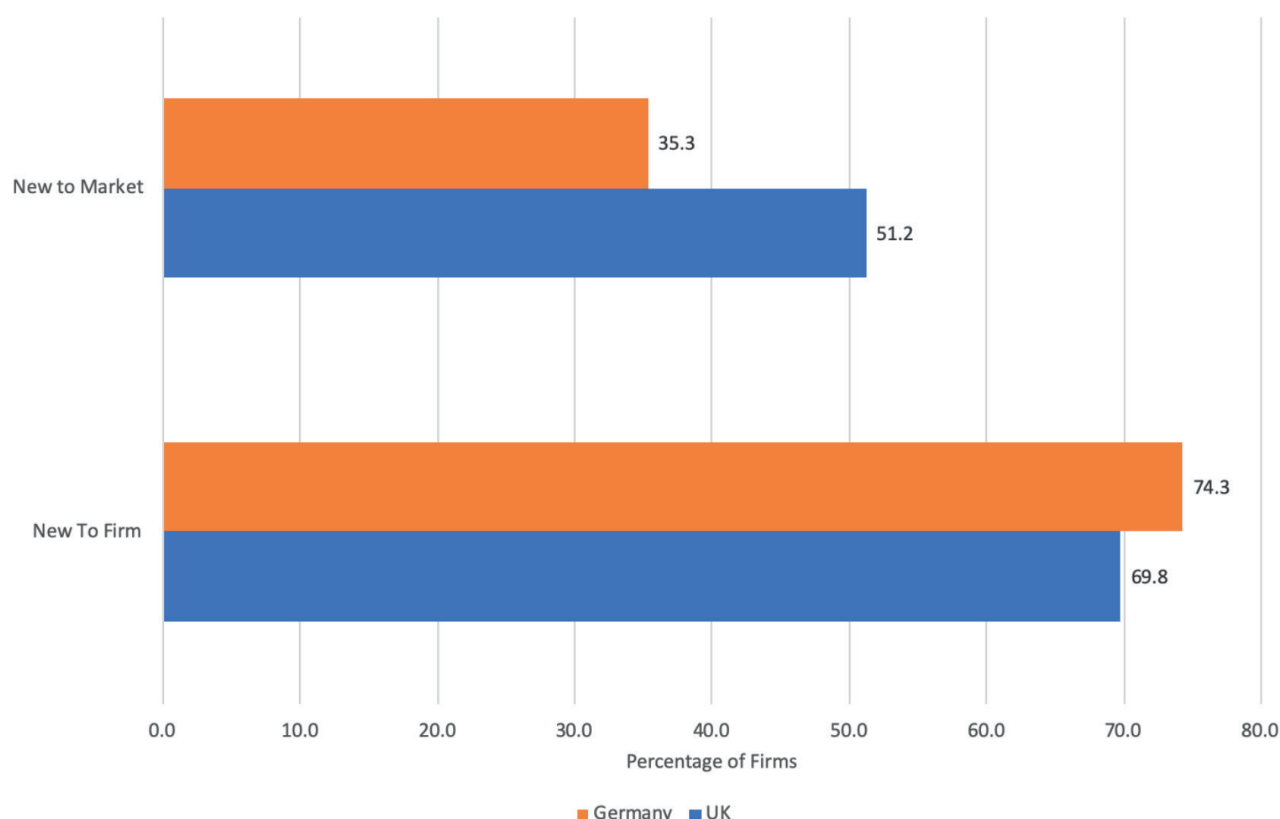


One of the key attributes of Mittelstand companies is their capacity for innovation. In the survey we follow the approach taken in the UK Innovation Survey (and EU Community Innovation.

⁹ Hermans, J., Vanderstraeten, J., Van Witteloostuijn, A., Dejardin, M., Ramdani, D., & Stam, E. (2015). Ambitious entrepreneurship: a review of growth aspirations, intentions and expectations. In *Entrepreneurial growth: individual, firm and region* (Vol. 17, pp. 127-160).

Survey) and focus on firms' innovation activity over the last three years. This reflects the time taken for intangible investments and externally-sourced knowledge to feed through into new products or services and have a discernible impact on firms' bottom line. We also look at two different definitions of 'innovation'. The first relates to 'any new or significantly improved products or services'. The second, more demanding definition, relates to new to the market innovation, innovations which were introduced by firms 'before their competitors'. As anticipated, German firms were marginally more likely to have introduced an innovation while UK firms reported a higher incidence of more radical new-to-the-market innovation (Figure 3.3).

Figure 3.3: Innovation in Mittelstand firms: UK and Germany



The types of innovations reported in the UK varied between automotive companies with many related to improvements to existing products. For example, a 'higher performance clutch, which is more driveable' and 'updates to our existing range - modifications in response to customer feedback'. Other firms highlighted new product innovations - the 'most advanced electronic heating unit ever designed and a world first'. Developments in specialist vehicles were also a form of new innovation for a number of respondents - 'a multipurpose vehicle for councils and the road agency', 'a safety device, an overhead power cable detection new device that fits onto vehicles to detect high voltage lines'. Others stressed developments in electric vehicles, e.g. 'development of a micro electric vehicle' and 'conversion of electric vehicles for people with disabilities'.

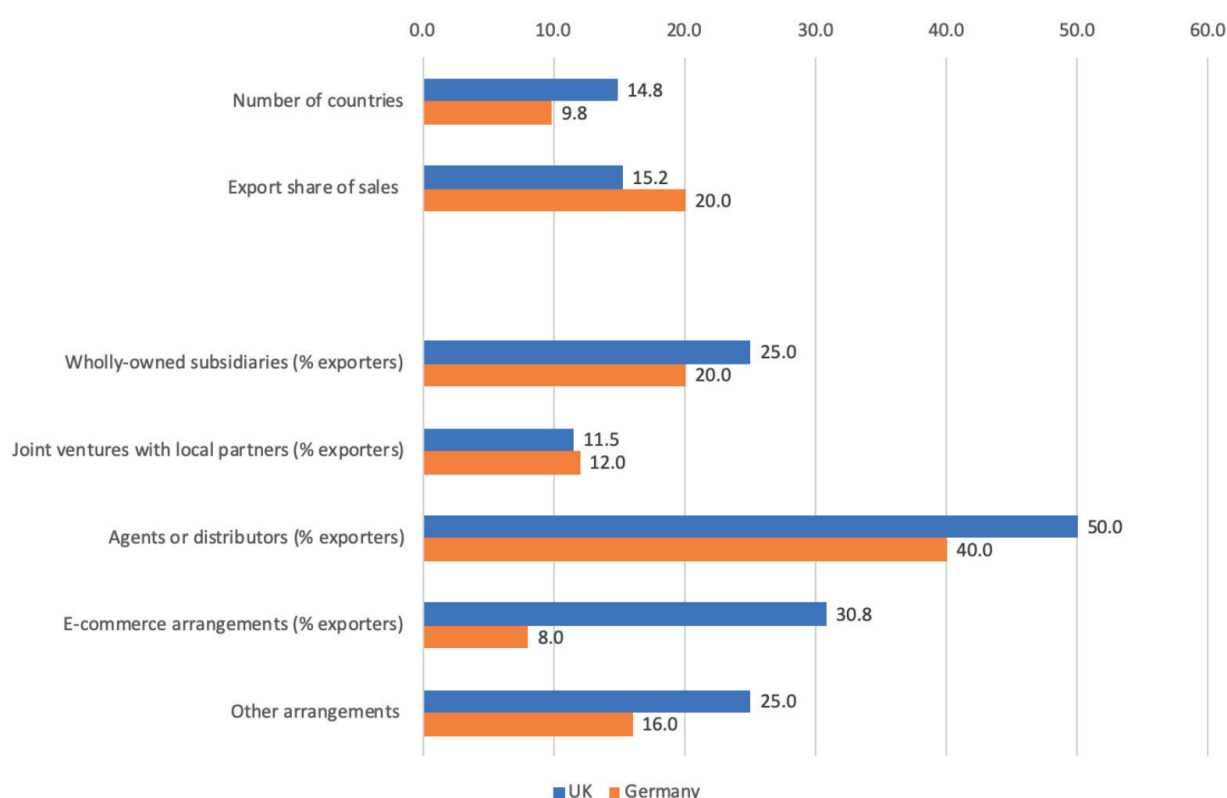
German firms reported a similarly diverse group of innovations including new products (e.g. '... new constructions for electric cars. Constructions, platforms, and cool cases for electric cars'), improved products (e.g. '... expanded our service and portfolio ... It was further development of products, rather than new products'), organisational changes (e.g. '... a new production unit') and changes to IT and systems. For some firms, IT changes were now enabling them to work more efficiently through internal IT development, for example, 'a new ERP system'. For other firms, IT upgrades were part of a regular investment cycle: 'We completely updated our IT. This is renewed in the business every three years, something is always renewed. Machines break and have to be replaced'.

4. The Mittelstand Mindset in UK and German Firms

4.1 Globalised Strategies

As indicated earlier, Mittelstand firms are said to adopt globalisation strategies based around a tightly defined market niche. This helps to hedge market risk, maximises 'learning by exporting' and often results in an extensive export footprint. Our data suggests that despite their smaller size UK respondents are – on average – selling into more national export markets than German firms although export intensity among German firms was marginally higher (Figure 4.1).

Figure 4.1: Countries Exported to Over the Last Year: UK and German Firms



There is some evidence which also suggests that the way in which Mittelstand firms organise and structure their export sales may be different to that in other firms. Reflecting Mittelstand firms' desire to maintain close relationships with customers it is suggested that international sales may be made directly or through local subsidiaries rather than through agents or distributors. Among our respondents, German firms are significantly less likely than their UK counterparts to use E-commerce arrangements, agents or distributors (Figure 4.1). However, we find no evidence that German respondents were more likely to be selling internationally through joint ventures or subsidiaries.

Firms in the UK stressed the advantages of exporting as a way of building scale and increasing sales and profitability:

'Exporting abroad allows us to look further than the UK and make money from foreign markets as we are in a global business'.

And,

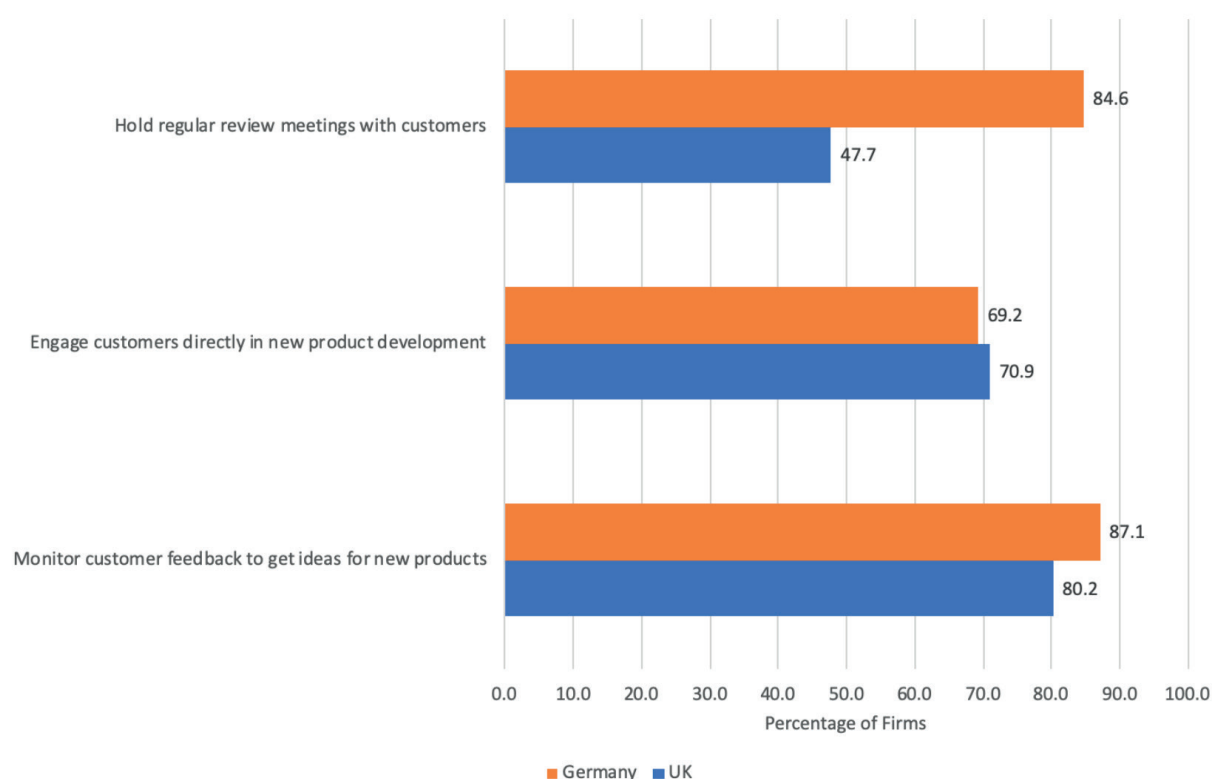
'Exporting exposes us to more customers and more markets. There is also benefits of being able to access the global automotive industry and get access to it'.

Other firms stressed the advantages of spreading customer awareness and the potential for learning-from-exporting: 'We learn new things and more about what's going on in the market'. German firms reported similar advantages related to scale and profitability and also see exporting as a means of spreading risk: 'We are less dependent on the German industry ... more diversified'.

4.2 Customer Collaboration

Maintaining close – often personal – relationships with customers both at home and abroad is seen as a key attribute of Mittelstand firms. One aspect of this is the way in which firms engage with customers – monitoring feedback, holding review meetings and engaging customers in new product development (Figure 4.2). German firms in our group of respondents were much more likely to report holding regular review meetings with customers (85 per cent) compared to UK firms (47.7 per cent). Monitoring feedback and engaging customers in product development was standard practice among both groups of respondents (Figure 4.2).

Figure 4.2: Customer Engagement in UK and German Firms

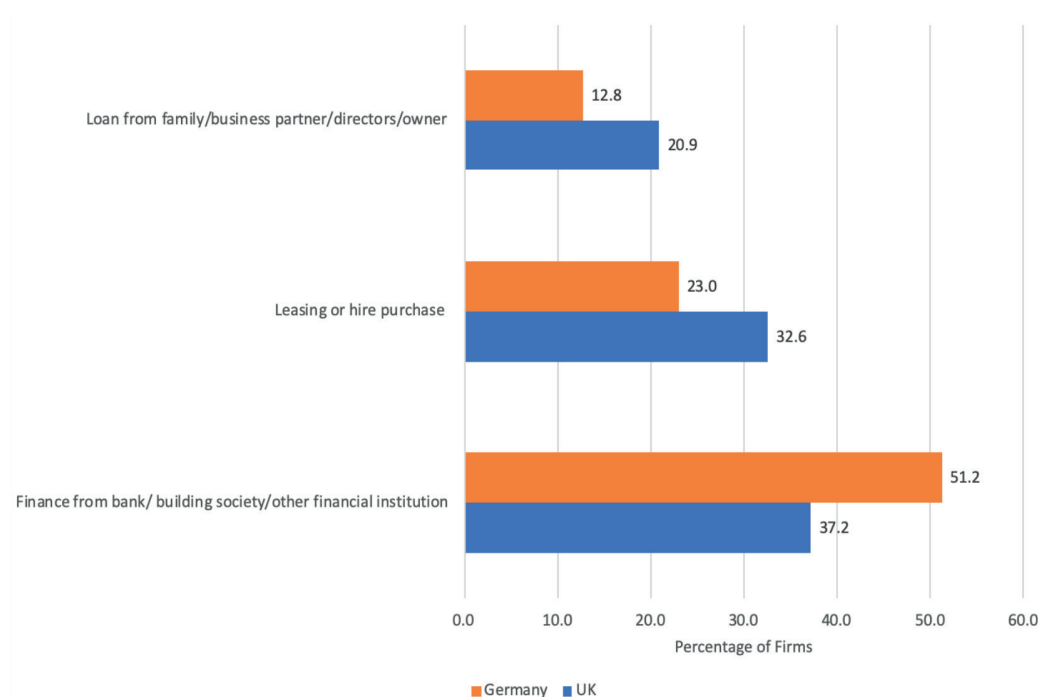


Mittelstand firms are often said to maintain relationships with customers which involve a significant proportion of the workforce. This may help to spread an understanding of customer needs throughout the business and help develop and sustain a business-wide commitment to customer satisfaction and service. We might expect this to be reflected in the proportion of firms' employees who 'regularly have direct contact with customers'. In fact, firms in the UK reported that – on average – 32 per cent of their workforce had contact with customers compared to 25 per cent in Germany.

4.3 Internal and Patient Capital

As indicated earlier, Mittelstand firms generally have a strong preference for internal funding and organic growth. Engagement with external financial institutions may therefore be more limited. Investment decisions may also focus on longer timelines – capital may be more ‘patient’ than in other firms. Among our respondents the proportion of firms using external finance or one sort or another differed relatively little between countries – 55 per cent in the UK and 59 per cent in Germany. UK firms were more likely to have loans from partners or owners and be engaging in lease or hire purchase while German firms were more likely to be relying on bank finance (Figure 4.3).

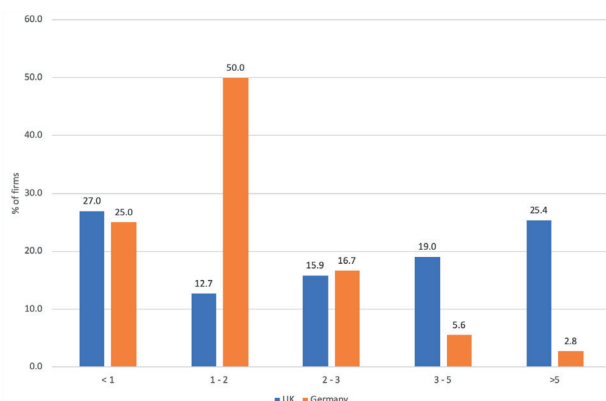
Figure 4.3: Use of External Finance in UK and German Firms



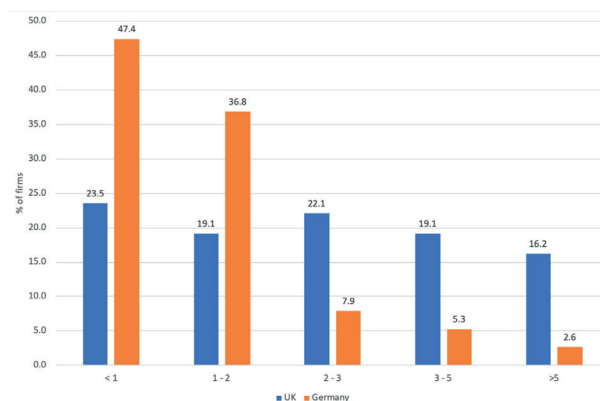
Investment may take many forms and here we consider firms’ planning horizons when making decisions about four different types of investment: production equipment, computer hardware and software and buildings. Figure 4.4 gives the distribution of firms in each country across different planning horizons for each type of investment. For production equipment and computer hardware and software planning horizons in UK firms were notably longer than those in Germany. For buildings the situation is less clear although here again the proportion of UK firms envisaging a time horizon of five years or more was nearly twice that in Germany (Figure 4.4).

Figure 4.4: Planning Horizons in UK and German Independent SMEs

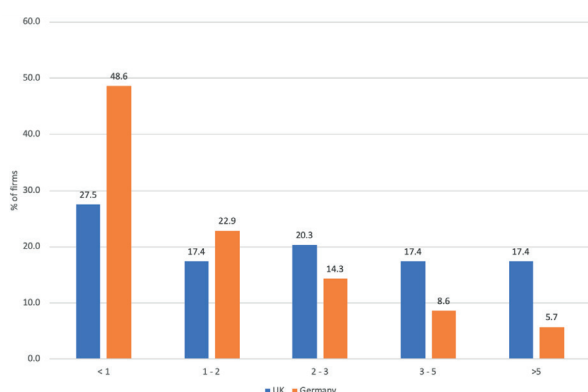
(a) Production Equipment



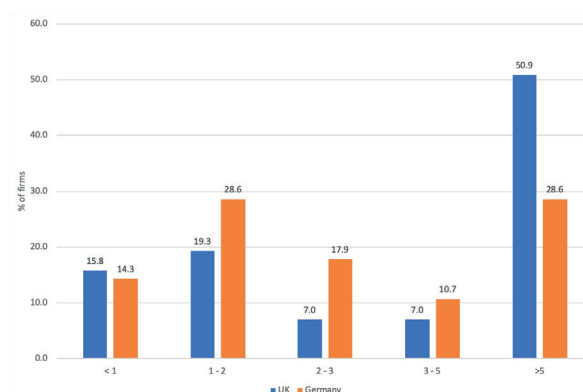
(b) Computer Hardware



(c) Software



(d) Buildings



4.4 Employee Relations and Community Links

The final aspects of the Mittelstand Mindset relate to firms' employee and community relations. We have already seen that 'Increasing the social and environmental benefits of business' was important for a larger percentage of German firms (64 per cent, UK 45 per cent) (Figure 3.2). As part of the survey we also asked whether firms were supporting any kind of activity or initiative which had a social, environmental or community objective. In the UK, around 1:4 firms were engaged in some way with their local community, this figure was higher in Germany at around 62 per cent than in the UK (24 per cent). In around half of firms which reported some community engagement this was said to be having some form of business benefit.

Employee engagement and 'familiness' are often said to be part of the Mittelstand Mindset but here we find little significant difference between UK and German firms: 69 per cent of German firms and 75 per cent of UK respondents regarded it as important to 'create a culture of employee engagement' in their firm (Figure 3.2).

5. Digital Adoption and Integration

5.1 Adopting Digital Technologies

We investigated the adoption of seven digital technologies: Customer relationship management (CRM), E-Commerce, Web-based Accounting Software, Computer-Aided Design (CAD), Cloud computing, Artificial Intelligence (AI) and Machine Learning (Box 2).

Box 2: Description of Digital Technologies

Customer relationship management (CRM) systems use data analysis about customers' history to improve business relationships with customers, specifically focusing on customer retention.

E-commerce involves selling goods and/or services through the company website.

Web-based accounting software is an accounting information system which can be accessed with any device which is internet enabled.

Computer-aided design software aids in the creation, modification, analysis, or optimization of a design.

Cloud computing involves the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

Artificial intelligence is the simulation of human intelligence processes – learning, reasoning and self-correction – by machines, especially computer systems.

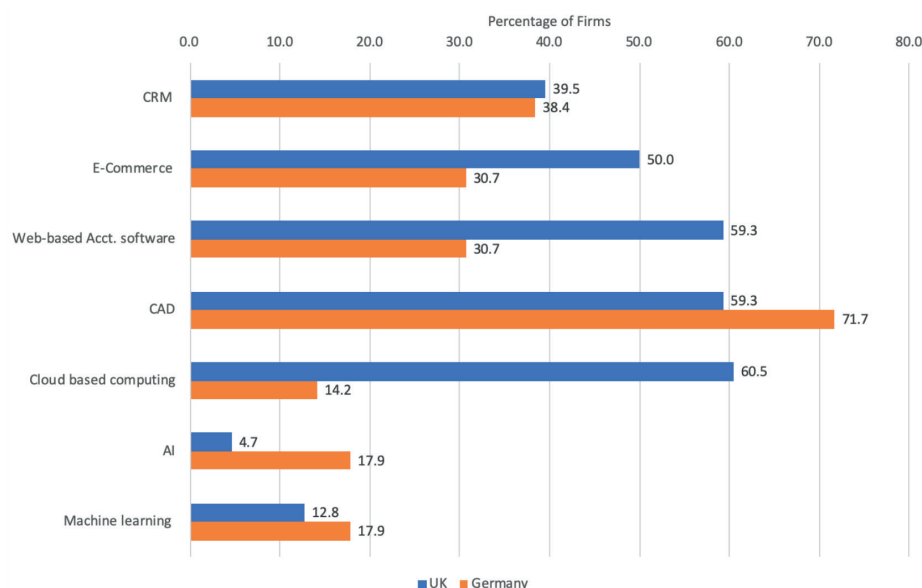
Machine learning technologies use statistical techniques to give computers the ability to “learn” (i.e., progressively improve performance on a specific task) with data, without being explicitly programmed.

Cloud-based computing, web-based accounting software and CAD are the most commonly used technologies in UK automotive firms with 60.5, 59.3 and 59.3 per cent of firms using these technologies (Figure 5.1). However, adoption of cloud-based computing and web-based accounting software is lower in Germany, with 30.7 per cent of firms using web-based accounting software and 14.2 per cent of firms using cloud-based computing. In contrast, adoption of CAD is higher in Germany with 71.7 per cent of firms surveyed using this technology. In fact, CAD is the most commonly used digital technology among German automotive firms.

E-commerce is more prevalent among UK automotive firms. Half of the firms surveyed use e-commerce, compared to 30.7 per cent in Germany. However, adoption of CRM is broadly similar for UK and German firms, with less than 40 per cent of firms using this digital technology.

In relation to the more emergent technologies of AI and machine learning, adoption is higher in German firms. 17.9 per cent of firms use both AI and machine learning. This compares with adoption levels of 4.7 and 12.8 per cent respectively in UK firms.

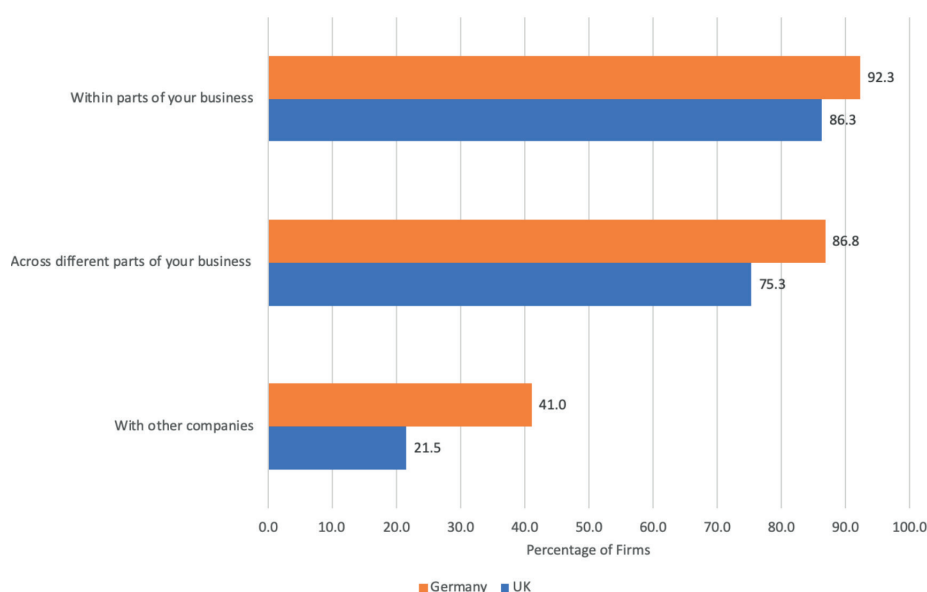
Figure 5.1: Digital Adoption by Automotive Firms in the UK and Germany



5.2 Connectivity Within and Between Firms

Connectivity and data sharing between equipment, business departments and firms is essential to maximise the benefits of digitisation and data analytics. In this section we consider the extent to which automotive SMEs in the UK and Germany have networks which can share data within and between firms. Specifically, we asked firms whether 'computers, machines and systems in different parts of their business are networked to share data (a) with other firms (b) with other parts of the business or (c) within parts of the business.

Figure 5.2: Digital Adoption by Automotive Firms in the UK and Germany



Network connectivity within parts of the business is broadly similar for German and UK automotive firms, with 92.3 and 86.3 per cent of firms respectively stating that computers, machines and systems in different parts of their business are networked to share data within

parts of the business (see Figure 5.2). Network connectivity with other parts of the business is slightly better in German firms with 86.8 per cent of firms with computers, machines and systems networked to share data with other parts of the business. This compares to 75.3 per cent of automotive firms in the UK. However, network connectivity with other firms is considerably higher in German automotive firms compared to UK automotive firms. 41 per cent of German firms have network connectivity with other firms' capabilities, while approximately only one in five UK firms are networked to share data with other firms.

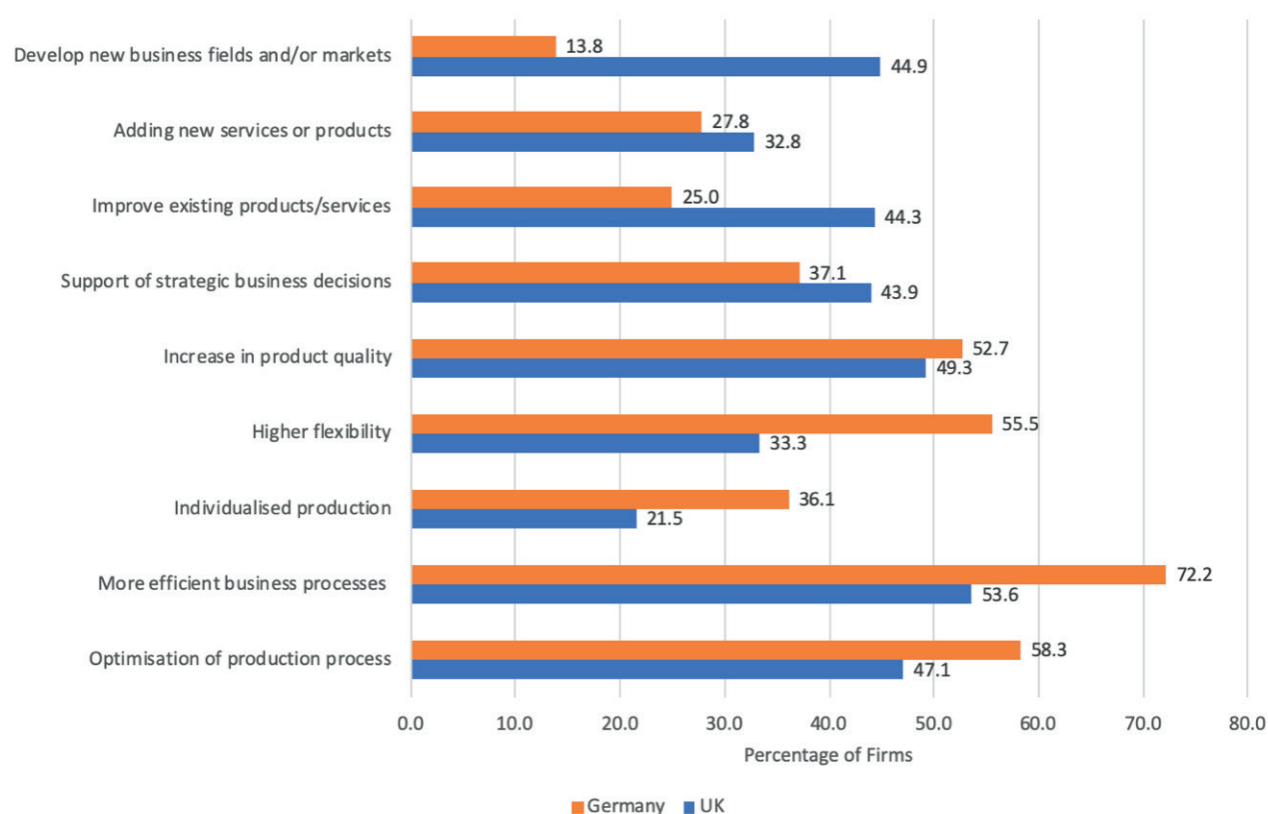
Shared data networks can be expensive and difficult to implement, so what is the rationale for this investment in automotive firms? Figure 5.3 summarises the proportion of independent automotive SMEs which had implemented either in-house or inter-firm data sharing networks indicating that particular motives for networking were 'very important'. There are some marked differences in the importance assigned to different motives for implementing networking and data sharing in German and UK automotive firms. In general, German firms appear to place a higher value on the impact of connectivity to more efficient and flexible production processes, while UK firms are more likely to consider it important for strategic reasons, new/improved product development and entering new markets.

The two most important reasons identified by German automotive firms for implementing networking and data sharing are more efficient business processes and optimising of production processes. 72.2 and 58.3 per cent of firms respectively consider these two reasons very important. Both reasons are considered important by a smaller proportion of firms in the UK (53.6 and 47.1 per cent respectively).

Higher flexibility is also important for German firms, with more than half of firms identifying it as a very important motive for networking and data sharing. However, only one-third of UK firms consider higher flexibility a reason for implementing networking and data sharing. Approximately half of all German and UK firms surveyed considered increased product quality an important reason for networking and data sharing.

UK firms were more likely to identify the following as very important motives for implementing networking and data sharing than their German counterparts: develop new business fields and/or markets (44.9 versus 13.8 per cent); improving existing products or services (44.3 versus 25.0 per cent) and support of strategic business decisions (43.9 versus 37.1 per cent).

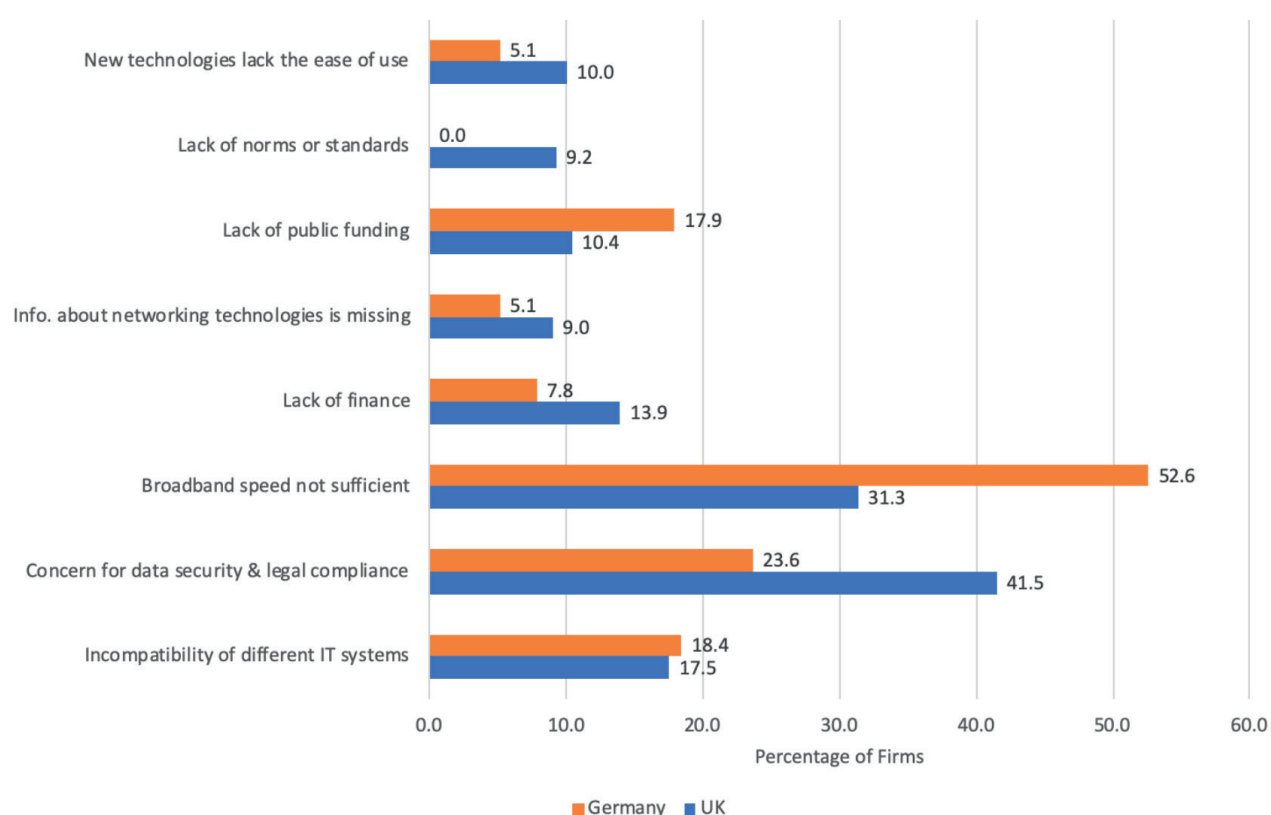
Figure 5.3: Reasons for Implementing Networking and Data Sharing: Independent Firms with some Data Networking



Implementing data sharing can also be challenging due to technical considerations, resource constraints or attitudinal or skills barriers. As part of the survey we asked firms how important a number of barriers were in implementing their networks, or where they had not implemented data networks, how important the barriers were in stopping them doing so. Table 5.4 summarises their responses focussing on the proportion of independent SMEs reporting each barrier to be a 'large issue'.

Insufficient broadband speed and concerns for data security and legal compliance were identified as the greatest barriers to implementing networking and data shared by firms in Germany and the UK. Insufficient broadband speed was identified as important by more than half of German automotive firms and almost one-third of UK automotive firms. Concerns for data security and legal compliance was identified as an important barrier by 41.5 and 23.6 of UK and German firms. The next most important barrier to implementing networking and data shared identified by German (18.4 per cent) and UK firms (17.5 per cent) was incompatibility of IT systems.

Figure 5.4: Barriers to Implementing Networking and Data Sharing: Independent Firms with some Data Networking



5.3 Smart Products

Another aspect of Industry 4.0 relates to the 'Internet of things' or internet-enabled products which have the capability to be networked with other devices and share data. We asked firms whether any of the products they produced met this description. 19 per cent of firms in the UK and 21 per cent in Germany confirmed that some of the products they produce could be described as 'smart' products.

6. Summary of Interim Findings

It has been suggested that there are seven key traits which define Mittelstand Mindset. At this point in the study a comparison of our UK and German respondents we find no very clear distinction on five of the key traits:

- We find little evidence that German automotive SMEs have **niche market strategies** based on innovation: In fact, UK firms were more likely to introduce new to the market innovations.
- In term of **globalised strategies** UK firms - on average - also export to more countries than German respondents. Approaches to international marketing are relatively similar.
- We find little difference in the proportion of UK and German firms using some form of **external finance**. German firms are more bank dependent however than UK firms. This provides little support for the argument that Mittelstand firms exhibit a strong preference for self-financing.
- We find little evidence that German respondents have a **longer-run mindset** than our UK respondents – in fact, planning horizons are longer in the UK.
- Finally, both UK and German respondents exhibit very similar priorities when it comes to employee relations, with the majority of firms in both countries regarding a climate of **employee engagement** as important.

In terms of two other traits we do find clear differences between our UK and German respondents. Interestingly, both of these traits relate to firms' relationships with other customers and other organisations:

- In terms of **community embeddedness**, German firms in our sample were significantly more likely to be supporting community or environmental activities than our UK companies.
- **Customer collaboration** - German respondents were significantly more likely to have regular review meetings with customers than our UK respondents, perhaps suggesting a rather different attitude to relationships with customers. Other aspects of customer collaboration were broadly similar, however.

In addition, customer collaboration by German firms is likely aided by the higher levels of interfirm connectivity reported by German firms. While network connectivity within parts of the business is broadly similar for German and UK automotive firms, German firms are significantly more likely to be networked to share data with other firms.

German firms identify more efficient and improved production processes as important motivations for network connectivity and data sharing. These are important motivations for UK firms also, but they are also more likely to consider connectivity important for strategic reasons, new/improved product development and entering new markets than their German counterparts.

Both UK and German firms reported insufficient broadband speed and data security and legal compliance as the main barriers to implementing data sharing. Broadband speed was identified as the most important barrier for German firms, while concerns around data security and legal compliance is the greatest challenge to data sharing for UK firms.

In relation to digital technology adoption, we see some marked differences in the digital technologies favoured by German and UK firms. Levels of adoption are higher for CAD, AI and machine learning in German firms, while UK firms are more likely to adopt cloud-based computing, web-based accounting software and e-commerce. It appears that motivations for digital adoption decisions are more likely to be around product development for German firms and operational functions for UK firms.

Our interim results emphasise both the similarities and differences between the Mittelstand model of entrepreneurship in Germany and that in the UK. Similarities are evident in terms of a range of market-facing and operational capabilities. Differences are most evident in terms of customer collaboration, community links and inter-firm connectivity. As Pahnke and Welter (2019) comment, the Mittelstand is entrepreneurship that 'builds on a sense of responsibility and solidarity'. Our results suggest that the connectedness and embeddedness which this requires seems less evident across UK firms.

Annex 1: ERC Publications 2018-2019

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