

**STATE OF SMALL
BUSINESS BRITAIN
REPORT 2018**



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The State of Small Business Britain

Part A: SME trends and recent research

Stephen Roper and Mark Hart

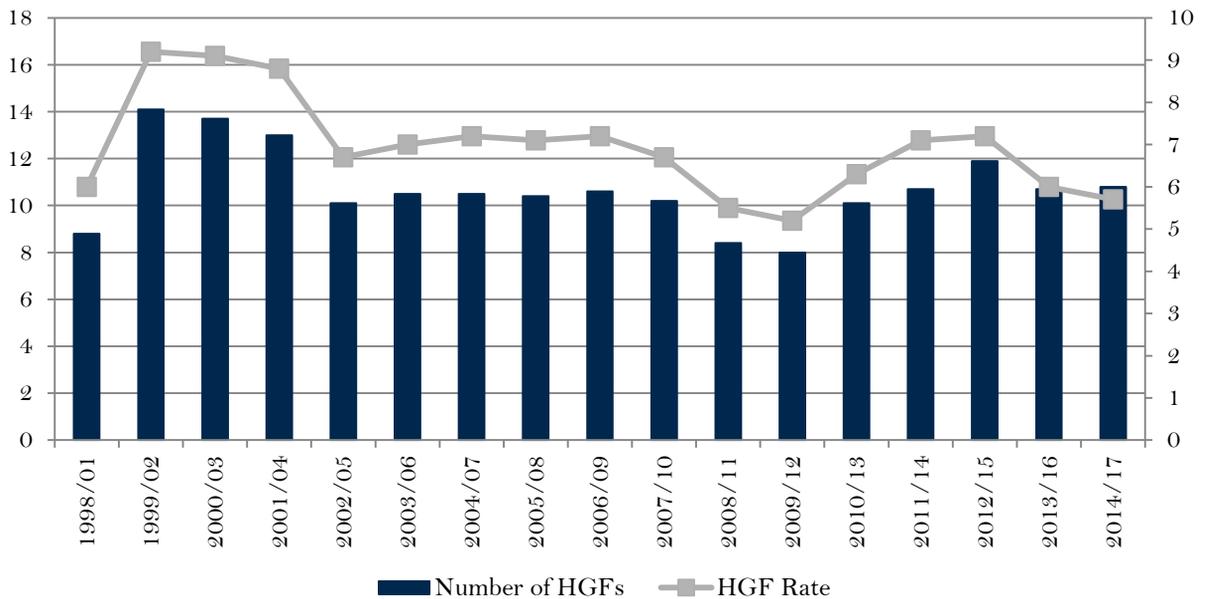
SME Trends and recent research

1. Overview

The most recent survey evidence suggests that the profile of growth achieved by the UK's SME population has remained broadly stable since 2015. In 2017, 36 per cent of SME employers reported turnover growth in the Longitudinal Small Business Survey (LSBS), with 19 per cent of firms reporting a fall¹. These proportions were broadly similar to those in 2015 and 2016. Expectations of growth also remain broadly stable, with 47 per cent of LSBS respondents expecting turnover to increase during 2018. Evidence from the same survey also provides some welcome news about SME exporting with the proportion of exporting firms rising 2pp between 2016 and 2017.

Looking at data from the longitudinal Business Structure Database (itself based on VAT and PAYE data) can provide a long-term picture of the proportion of high-growth firms (HGFs) in the UK. A high-growth firm is here defined using the standard OECD definition: more than 10 employees, three years old and has achieved average growth of either sales or employment of 20 per cent pa for the last three years². In 2017 there were around 11,000 such firms in the UK, accounting for around 6 per cent of the eligible population of SMEs. Figures were broadly similar to those in 2016 (Figure 1.1). We also know that this small group of high-growth firms, whether start-ups scaling or more established businesses growing rapidly for the first or second time, continue to have had a disproportionate impact on job creation. While we continue to measure and report this OECD metric we will see later in this report that a single-minded preoccupation with HGFs may not be a sensible focus for policy-makers. Not only are these measures somewhat artificially defined, they also have the disadvantage of rendering invisible the reality of growth for the majority of businesses.

Figure 1.1: Trend in high-growth firms in the UK: Number and rate (1998-2017)



Source: ERC analysis of the Business Structure Database (BSD)

¹ See https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/710553/LSBS_2017_cross-sectional_SME_Employer_report.pdf.

² This has now been revised to a threshold of 10% growth per annum for a three year period.

In terms of early-stage enterprise, data from the Global Entrepreneurship Monitor (GEM) indicated that in 2017 (the most recent data available) the proportion of the adult population in the UK engaged in early-stage enterprise (the GEM Total Early-Stage Entrepreneurial Activity or TEA rate) was 8.7 per cent. This was markedly higher than the long run rate of around 6 per cent observed before 2010, notably higher than France or Germany, but lower than the US. The GEM UK report, in association with the Royal Bank of Scotland, will be published in July 2018.

The LSBS suggests some underlying concerns, however, about future levels of ambition and SMEs' willingness to borrow and invest for future growth. In the 2017 survey, 62 per cent of SME employers indicated that they planned to growth the turnover of their business over the next three years, the lowest figure since the survey began in 2007/8. At the same time SME's willingness to seek external finance has also fallen consistently since 2010.

SMEs' willingness to invest has also softened. In 2017, the LSBS suggests that 49 per cent of SME employers had arranged or funded training in the previous year. This was a fall of 6 percentage points on 2016 and the lowest level since 2010. There is also consistent evidence of some retrenchment in terms of other intangible investment and innovation activity among SMEs. The LSBS has identified a fall in levels of product and service innovation activity among SMEs since 2015. This pattern is supported by data from the UK Innovation Survey 2017, published in May this year, which suggested that the proportion of 'innovation active' SMEs fell from 53 per cent in 2012-14 to 49 per cent in 2014-16. Over the same period the proportions of firms investing in aspects of their innovation activity also fell: computer software (27% to 19%), computer hardware (24% to 13%), new marketing methods (12% to 4%) and launch advertising (8% to 3%).

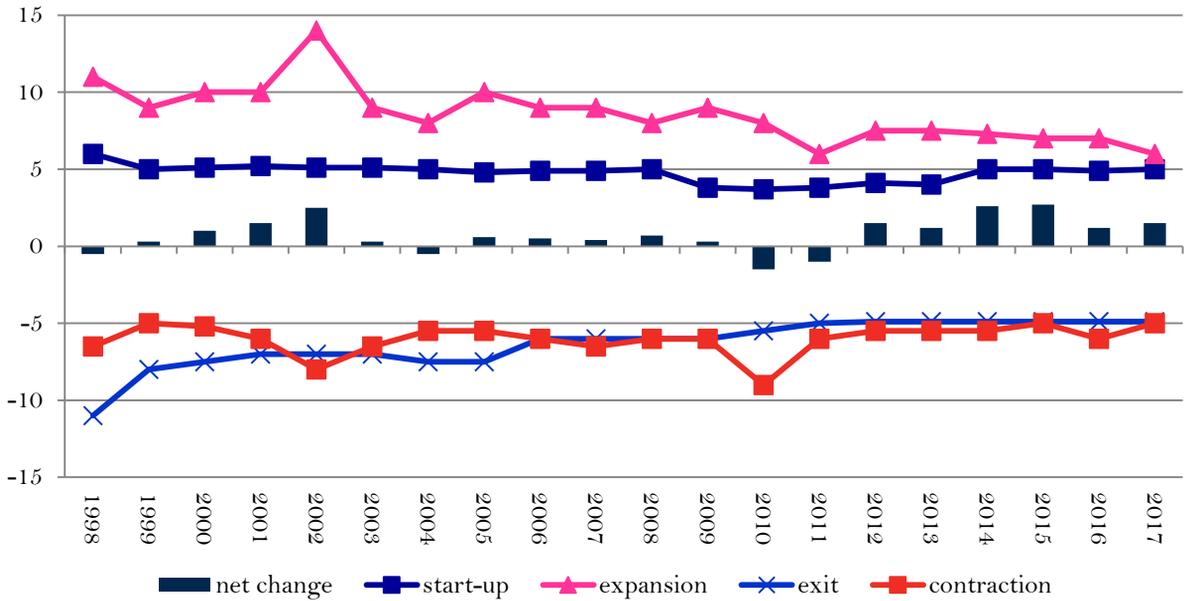
Trends in start-up, growth and retrenchment all play an important role in shaping job creation in both gross and net terms and together form a measure of business dynamism in the economy. The number of start-ups in an economy is often seen as the headline metric of 'enterprise' and 'entrepreneurial ability'. Start-ups have been rising steadily in the UK in recent years but seems to have stagnated in 2017. Many start-ups fail within a few years, so start-ups contribute to both job creation and job destruction. A small subset of start-ups, however, grow quickly, and contribute disproportionately to net job growth and to improvements in industry productivity.

Workers also move among firms at tremendous rates which means that gross job creation and destruction are much larger than net job creation. As workers reallocate, it is argued that productivity increases, knowledge diffuses, and the structure of production changes. There is a standard methodology to undertake this analysis of job reallocation rates which we have just completed for the UK (Figure 1.2). Based on ERC analysis of the Business Structure Database (BSD) net job creation rose slightly from 2016 to 2017 due to a reduction in job losses in contractions and a slight rise in jobs created in new firms.

We can see that there was very little variation in these rates of job creation and destruction over the period – summing all the components together we arrive at the job reallocation rate which at 22% in 2017 is only slightly lower than what it was 20 years ago due to the strong rise in start-up rates. This contrasts with the US where there is growing evidence that business dynamism and entrepreneurial activity are declining as over the last 30 years the number of start-ups and the scale of job reallocation rates have been in decline.³

³ Goldschlag, N and Tabarrok, A (2018) "Is regulation to blame for the decline in American entrepreneurship", *Economic Policy*, 33 Issue 93 pp 5-44.

Figure 1.2: Job creation and destruction by component, 1998-2017



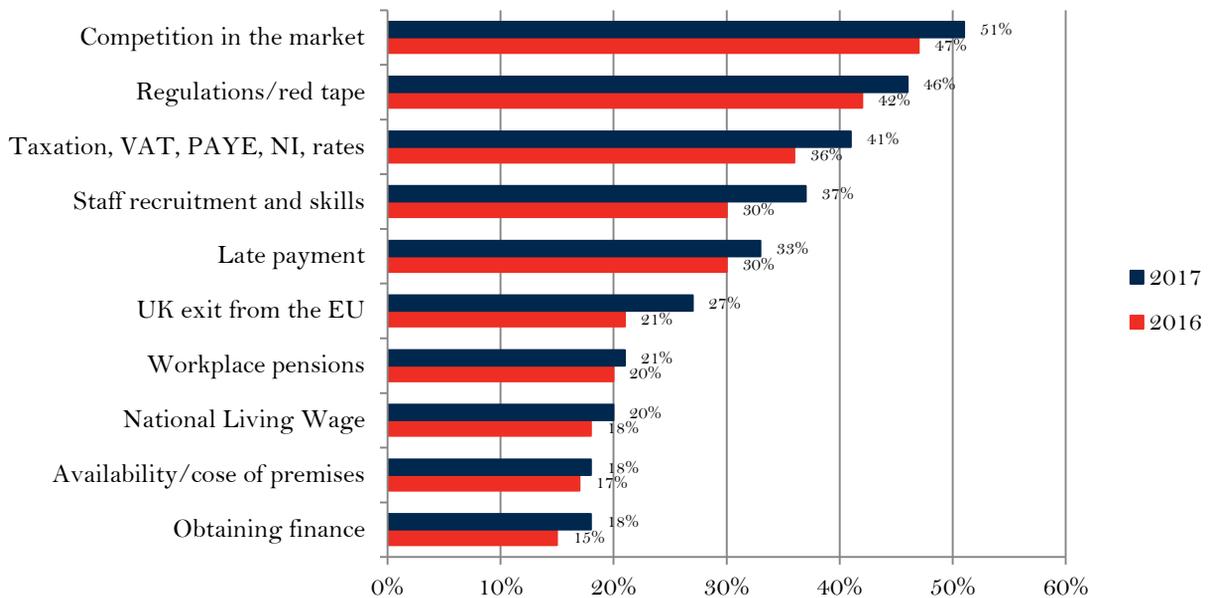
Source: ERC analysis of the Business Structure Database (BSD)

2 SME Challenges and opportunities

Brexit dominates current public debate and will impact on some SMEs. LSBS data (collected in 2017 Q4) suggests that 54 per cent of SMEs thought Brexit would have no impact on their business with 27 per cent anticipating a detrimental effect and 8 per cent a positive benefit. (The other 11 per cent of SMEs were uncertain). Perhaps more telling in the long-term, however, will be the impact of Brexit uncertainty on investments which might drive future growth. The LSBS again suggests that 28 per cent of firms intending to increase export sales had scaled down this activity due to Brexit. Similarly, 10 per cent of SMEs had scaled back plans to develop new products/services and 9 per cent had reduced capital and R&D spend. Conversely, 1-4 per cent of firms were scaling up export activity, innovation etc. in response to Brexit.

Aside from Brexit, more perennial concerns remain important with competition, red tape and regulation most commonly cited by SMEs as obstacles to their success (Figure 2.1). Notably over the last two years only around 1:6 SMEs have seen access to finance as a particular issue. Among those firms which did cite Brexit as an obstacle to the success of their business uncertainty about regulatory changes (81 per cent), future access to EU markets (63 per cent) and potential increases in input costs (56 per cent) were the dominant issues.

Figure 2.1: Proportion of SME employers citing each major obstacle to success



Source: LSBS 2017, SME Employers Report, p. 24.

3 Benchmarking local growth

The ERC UK Local Growth Dashboard has been published annually since 2014. Its purpose is to present a set of growth metrics for start-ups and existing firms across a range of subnational geographies in the UK with a specific focus on each of the 38 English Local Enterprise Partnership (LEP) areas. Due to the lags in the ONS datasets we use these metrics all refer to data in 2016 and do not yet reflect any effect of the Brexit uncertainty. They do, however, provide a crucial set of baseline metrics against which to monitor any such effects going forward.

The growth metrics which are used in the Dashboard are:

- 3-year survival rates of start-ups (2014-17)
- Proportion of 2014 start-ups that reach £1m+ T/O (2014-17)
- Proportion of £1-2m T/O businesses born before 2013 which grow to £3m+ T/O (2014-17)
- High-Growth Firm (OECD Definition) Incidence Rate (2014-17) – using both the traditional 20% threshold and the revised 10% threshold
- Small High-Growth Incidence Rate⁴ (2014-17) – a metric adopting a methodology advocated to avoid the exclusion of firms with less than 10 employees from the OECD definition
- Productivity Growth metric (2014-17) – a new metric this year looking at firms who growth both in terms of jobs and revenues but have a faster rate of growth in revenues

⁴ However, the US Bureau of Labor Statistics (BLS) has argued that the OECD measure was too narrow and were concerned with the exclusion of firms with less than ten employees in the first year of the three year growth period. The BLS alternative measure 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 refer to these as Small High Growth Firms (SHGFs). The ‘eight or more’ figure in the BLS definition was arrived at by multiplying the lower threshold of the OECD measure, ten employees, by the compound growth ratio, 1.728: if a firm with less than 10 employees added eight jobs, it would have contributed about the same amount to job creation as would a firm with ten jobs which grew by a factor of 1.728 and therefore satisfied the OECD criterion [Clayton, Sadeghi, Spletzer and Talan, “High-employment-growth firms: defining and counting them”, Monthly Labor Review, June 2013].



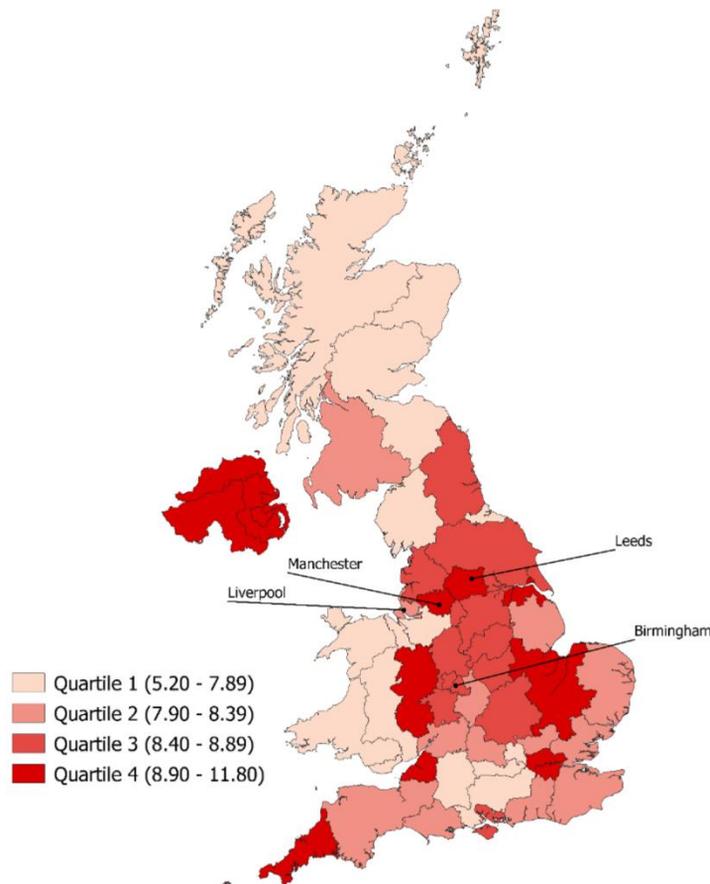
The new productivity metric reveals that only 8.4% of all employer enterprises in the UK achieved positive productivity gains (revenue per employee) while still increasing jobs over the period 2014-17. We devised this metric as a result of our previous research which showed that there was a very poor 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

Perhaps surprisingly, Northern Ireland had the highest proportion in the UK at 11% while the proportion in Wales and Scotland was 7.4% for both home nations which was below the average of 8.5% for England (Figure 3.1). Across the English LEPs the pattern is complex with the West of England, the North (Leeds City Region and Greater Manchester) and London having the highest proportions of firms with productivity growth measured in this way. Only Greater Cambridgeshire and Greater Peterborough LEP in the 'south' had above average proportions of firms with productivity growth. Indeed, many of the LEPs in the south of England (Bucks; Swindon and Wiltshire; Thames Valley Berkshire and Enterprise M3 had below average proportion of these firms.

Alongside productivity, the other Dashboard growth metrics we present later in this report will also show that there are a minority of firms engaged in growth whether it be increasing jobs or revenues. Critically, we can now see that there are many areas of the UK where, irrespective of the growth metric used, there has been a persistent absence of firms that grow rapidly. This is a matter of some concern as the next 12 months provide some acute economic challenges for the UK's small business leaders to negotiate.

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

Figure 3.1: Proportion of job-creating firms with positive productivity growth 2014-17 (where turnover and employment both increased but turnover grew at a faster rate)



Source: ERC analysis of the Business Structure Database (BSD)

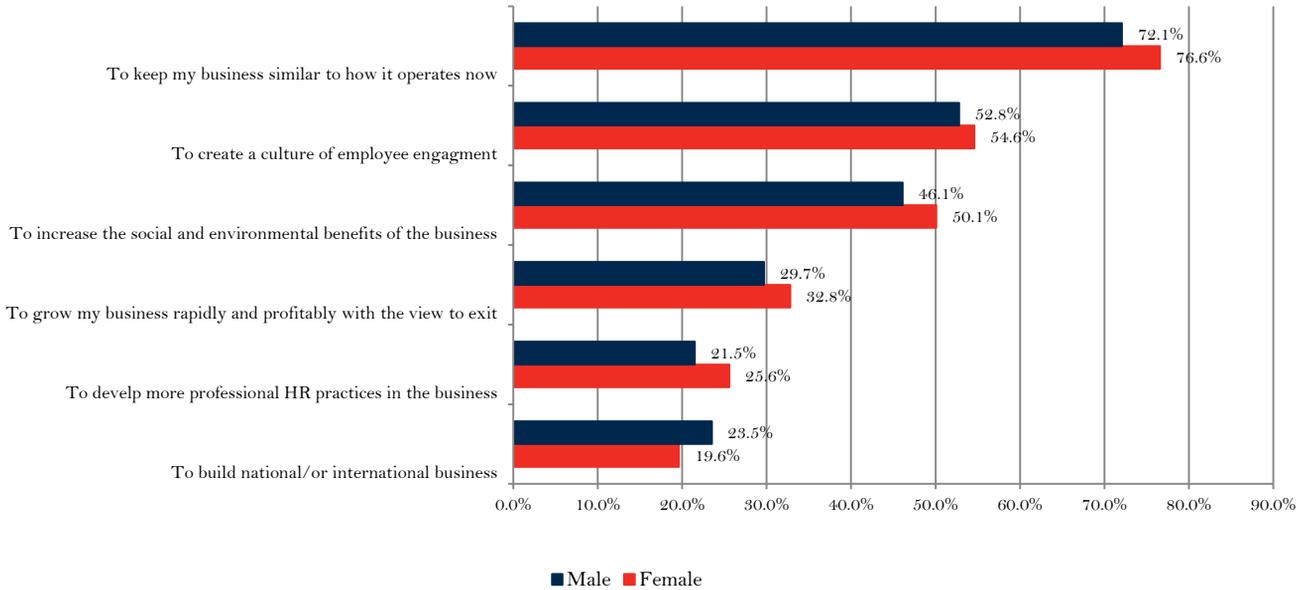
4 Micro-business Britain

In later sections of this report we provide an overview of the Micro-business Britain project focussing on ambition, innovation and digital adoption among micro-businesses. In 2017 there were 1.11m micro-businesses (with 1-9 employees) in the UK, employing around 4.09m people (17.6 per cent of the workforce). This group of firms accounted for £552bn in sales, 14.7 per cent of that by all UK firms.

The picture that emerges is that most micro-businesses are mature, and many are homebased. They are closely related to the families which own and run them, and that in most cases the founder is still involved. Reflecting the wider LSBS results, growth in sales has been modest for most firms over the last year. Nearly two-thirds of micro-businesses rely solely on internal funding, with around a third using external funding sources.

Previous studies have strongly linked owner-managers' growth ambition to the subsequent growth and performance of the firm. In the Micro-business Britain survey, we use a new set of ambition questions which reflect individuals' aspirations for their own future and for the future of their business. Notable contrasts are evident in terms of ambition with 73.7 per cent of all respondents aiming to 'keep their business similar to how it operates now', and a more ambitious 22.1 per cent of respondents aim to build a 'national or international business'. Little difference is evident between male and female business owners (Figure 4.1). Individuals' personal ambitions suggest a rather different set of priorities, with a marked emphasis on 'freedom' and 'flexibility'

Figure 4.1: Business objectives: By gender of business owner

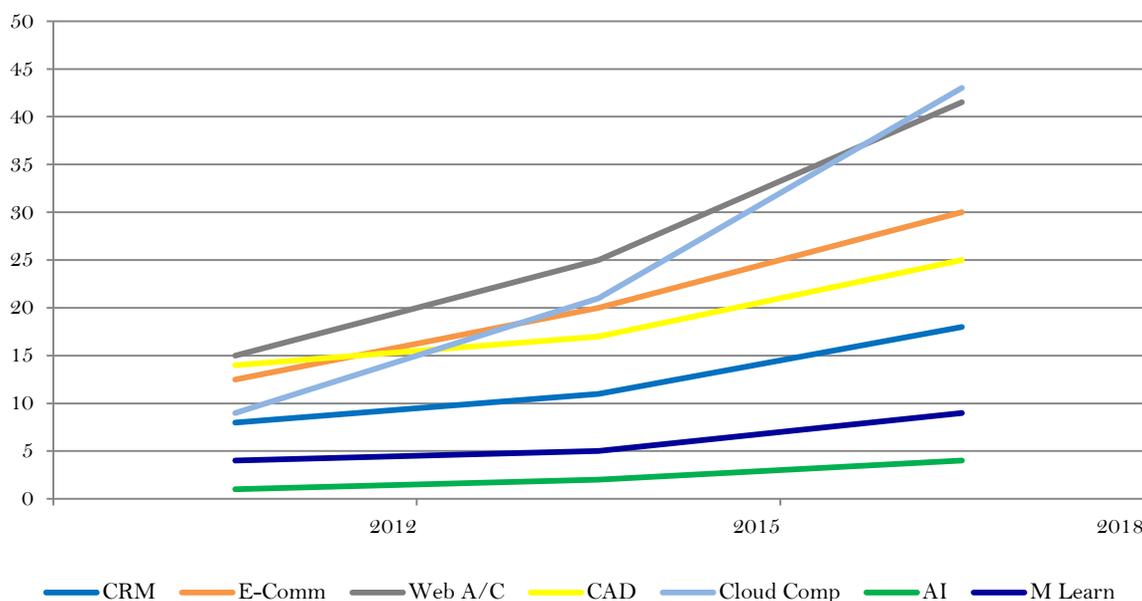


Source: Micro-business Britain Survey, 2018.

While gender differences in levels of ambition are relatively small we see larger regional differences in the proportions of micro-business owners aiming to grow their business. In terms of this metric London stands out with 35.9 per cent of business owners aiming to achieve national and/or international recognition. Levels of growth ambition among micro-businesses are markedly lower in other regions

One novel aspect of the Micro-business Britain survey is the focus on digital adoption. This has increased sharply in recent years (Figure 4.2) with web-based accounting software and cloud computing used by more than 40 per cent of micro-businesses. E-Commerce is used by 30 per cent of firms, with 25 and 18 per cent of firms using CAD and CRM software respectively. 9 per cent of firms use Machine Learning technologies, and only 3 per cent of micro-businesses are using AI. Almost one in four firms (25.3 per cent) use none of these digital technologies

Figure 4.2: Digital Adoption in UK Micro-businesses 2012-2018



Source: Micro-business Britain Survey, 2018.

Adoption of these digital technologies is strongly linked to sales per employee, a measure of productivity. Use of cloud-based computing leads to an increase of 13.5 per cent in sales per employee after three or more years while using a CRM adds 18.4 per cent to sales per employee over three years. E-commerce adds 7.5 per cent to sales per employee over three years while web-based accounting software leads to an increase in sales per employee of 11.8 per cent over three years. Computer aided design has a slightly smaller impact, increasing sales per employee by 7.1 per cent.

5. Research round-up

In this section we provide a brief review of insights from recent ERC and related SME research. A number of recent studies have been based on the first two waves of the LSBS with the third wave of this longitudinal survey due to be available to researchers over the next couple of months.

Andrew Henley and Meng Song (2018)⁶, for example, focus on the sub-sample of sole-proprietorships and micro-businesses in the LSBS (3,882 businesses) to examine the effects of business support. They find evidence that innovating micro-businesses are most likely to have formal business plans, use external advice or information and be aware of business support available from the government. However, these factors have no direct impact on exporting but may have an indirect on exporting through innovation. They also find evidence of a learning-by-exporting effect.

⁶ Henley, A and Song, M (2018) 'Management Capability, Business Support and the Performance of Microbusinesses in the UK', ERC Research Paper 68.

In a related analysis⁷, based on LSBS data for all SMEs, Areti Gkypali, Jim Love and Stephen Roper consider learning-to-export and learning-by-exporting effects. They identify a significant group of firms which while having products/services which are suitable for exporting make a strategic choice not to export. These 'domestically - focused firms' (DFFs) typically have higher productivity than other non-exporters – the learning-to-export effect – but lower productivity than exporting SMEs which also benefit from the learning-by-exporting effect. As in the paper by Henley and Song, Gkypali et al. (2018) also identify a strong link from innovation to exporting with the effect working primarily through export capability. That is, innovation shapes export capability but not necessarily firms' subsequent decision to enter export markets.

The link between exporting and productivity (sales per employee) is also reflected in another LSBS study by Rowena Barrett and colleagues⁸. Exploiting the time lag between Year 1 and Year 2 of the LSBS they consider the drivers of labour productivity. Among their key findings are:

- The trade coefficient is positive and significant, which means that firms with higher export intensity show better productivity performance.
- A significant and positive link between labour productivity and measures of strategic management, business capability, business networking, training and the technology intensity of firms.
- Strategic Management Practices, Training and Management Capability have a positive and significant influence on labour productivity.
- Strategic planning, as measured by a plan to improve leadership capability and a plan to sell goods to new overseas markets (a measure of innovation), significantly affects labour productivity.
- Management capability to access external finance and training to improve IT skills has significant and positive effects on productivity.
- Having their own website significantly affects productivity in firms positively as compared to firms without a website.

These papers suggest the important contribution of innovation to firm performance. Maximising the value of innovation depends on the effective management and organisation of the innovation process and another ERC Research Paper considers how firms can best balance the different resource and organisational requirements of 'exploration' and 'exploitation' in the innovation process⁹. Based on survey data on UK services Roper et al. (2018) find some strong contrasts, with more 'organic' practices associated with exploration and more 'mechanistic' practices better supporting exploration. The results suggest very different organisational strategies for services firms adopting business models which emphasise exploration, exploitation or both.

⁷ Gkypali, A Love, J H and Roper, S (2018) 'Export status and SME productivity: Learning-to-export versus learning-by-exporting', ERC Research Paper 71.

⁸ Barrett, R Shahiduzzaman, M and Kowalkiewicz, M (2018) 'Productivity of the UK's small and medium sized enterprises: insights from the Longitudinal Small Business Survey', ERC Research Paper 67.

⁹ Roper, S Bourke, J and Love, J H (2018) 'Organisational capital, exploration and exploitation: Econometric evidence for UK services firms', ERC Research Paper 65.

Finance, leadership and management and business support provide the focus for three other recent ERC research papers. Ross Brown and colleagues return to the theme of discouraged borrowers using the LSBS data¹⁰. They estimate that around one-in-ten SMEs across the UK (perhaps around half a million in total) are discouraged borrowers with potential implications for firms' ability to invest for growth. Discouragement appears greatest in London (15.7 per cent of firms) and, outside the capital, in more peripheral regions. Fear of rejection is one reason for discouragement but risk aversion – an unwillingness to borrow – proves a more important driver of discouragement. Another – forthcoming – ERC research paper suggests that financial rationing due to discouragement can have particularly detrimental growth impacts.

Business support and its effects on performance is the focus of a paper by Geoff Gregson and colleagues¹¹. This emphasises the importance of context and ambition in shaping the probability that firms engage with business support and the subsequent impact. Younger firms are less likely to seek business advice but where they do this is likely to relate to finance. Loss making firms are more likely to seek advice on cost reduction though efficiency improvement and financial management. Profitability is positively related to business advice about training and business growth, particularly where advice is paid for by the firm. The importance of context is also a key theme in the paper by Jonathan Levie and Enrico Vanino looking at the relationship between performance and the size and diversity of firms' leadership teams¹². Team diversity – defined in terms of ethnicity, gender and experience – and size are positively linked to innovation, export and growth performance. Effect sizes often vary, however, depending on the nature of the firm.

¹⁰ Brown, R Liñares-Zegarra, J and Wilson, J (2018) 'An empirical examination of discouraged borrowers in the UK. Research', ERC Research Paper 69.

¹¹ Gregson, G Mahdavi, H Raby, S and Saunders, C (2018) Business support and SME performance: exploratory analysis of the Longitudinal Small Business Survey 2015 and 2016, ERC Research Paper 70.

¹² Levie, J Vanino, E (2018) 'Team size, diversity and performance of new ventures and SMEs: a meta-analysis', ERC Research Paper 64.



The State of Small Business Britain

Part B: Micro-business Britain

Pathways to productivity – ambition, innovation, adoption

Stephen Roper, Mark Hart, Jane Bourke and Katherine Hathaway

Acknowledgements

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Micro-business Britain - Executive Summary

In 2017 there were 1.11m micro-businesses (with 1-9 employees) in the UK, employing around 4.09m people (17.6 per cent of the workforce). This group of firms accounted for £552bn in sales, 14.7 per cent of that by all UK firms. The Micro-business Britain Survey sheds new light on this diverse segment of the SME population in the UK and addresses important gaps in our understanding relating to innovation, technology adoption, ambition and productivity.

Understanding the UK's micro-businesses

The Micro-business Britain survey enables us to paint a distinct and vivid portrait of UK micro-businesses and their links to the households from which their owners originate. On average micro-businesses have median employment of 4.00 (mean, 3.34) and median turnover of £250,000 (mean £664,000). Around 85.6 per cent of firms reported generating a profit or surplus in the year prior to the survey. Micro-businesses in each UK region reported positive turnover growth, with growth across the UK averaging 2.8 per cent. This varied significantly both within and between regions, however, with the highest average turnover growth rate in the East of England.

On average businesses in the survey had been established for more than 22.8 years, with only 26.4 per cent either 10 years old or newer¹³. More than half of all micro-businesses (53.8 per cent) are home-based, having the same business and residential address. 70.1 per cent of them are family-owned and 59.0 per cent were both family owned and managed. In the vast majority of micro-businesses (81.9 per cent) the founder was still involved.

34.8 per cent of micro-businesses are led by a single person, with 45.1 per cent of micro-businesses have a leadership team of two. In the remaining businesses, where there are three or more members of the leadership team, 37.2 per cent are women and 9.8 per cent from ethnic minority backgrounds.

Around a third of micro-businesses are selling to either businesses or consumers outside the UK (33.3 per cent) and, on average, micro-businesses derive around 8.7 per cent of sales from outside the UK. The proportion of firms exporting differs significantly between regions with London and the North East having the largest proportions of exporting firms (Figure 2.3).

External finance was being used by 39.4 per cent of micro-businesses on average with use highest in Northern Ireland. (46.1 per cent) and lowest in Yorkshire and Humber (32.6 per cent).

A story of ambition – for the individual, for the business

Previous studies have strongly linked owner-managers growth ambition to the subsequent growth and performance of the firm. In the Micro-business Britain survey, we use a new set of ambition questions which reflect individuals' aspirations for their own future and for the future of their business.

73.7 per cent of all respondents aim to 'keep their business similar to how it operates now', and a more ambitious 22.1 per cent of respondents aim to build a 'national or international business'. Individuals' personal ambitions suggest a rather different set of priorities, with a marked emphasis on 'freedom' and 'flexibility'

While gender differences in levels of ambition are relatively small we see larger regional differences in the proportions of micro-business owners aiming to grow their business. In terms of this metric London stands out with 35.9 per cent of business owners aiming to achieve national and/or international recognition. Levels of growth ambition among micro-businesses are markedly lower in other regions

¹³ This is not representative of all micro-businesses in the UK as the sample was designed to exclude those micro-businesses aged three years or less.

Innovation – investments and outcomes

Across the whole sample of micro-businesses 32.4 per cent introduced a new or significantly improved product or service over the previous three years. This proportion varied significantly by region, however, from a high of 38.7 per cent in the North West to a low of 26.9 per cent in Northern Ireland. A lower proportion of firms (23.0 per cent) reported organisational changes or changes in business processes, again with strong regional variation.

10.6 per cent of micro-businesses reported new to the market innovation in products or services in the three years prior to the survey. This varied from a high of 13.0 per cent in the West Midlands to 7.7 per cent in Northern Ireland.

Only around 1:4 micro-firms reporting innovation were actually undertaking R&D. In other words, most micro-business innovation is not linked to R&D but other types of intangible or knowledge investments. Most common among these investments were computer hardware or software (64 per cent of innovators) and advanced machinery (33.4 per cent of innovators).

Collaboration with innovation partners provides another route through which micro-businesses can access new knowledge for innovation and share costs and risks. Around 38.4 per cent of innovating micro-businesses had collaborated for innovation during the three years prior to the survey.

Adoption of digital technologies

Web-based accounting software and cloud computing are the most commonly used digital technologies among UK micro-businesses, with more than 40 per cent of firms using these technologies. E-Commerce is used by 30 per cent of firms, with 25 and 18 per cent of firms using CAD and CRM respectively. 9 per cent of firms use Machine Learning technologies, and only 3 per cent of micro-businesses are using AI.

Almost one in four firms (25.3 per cent) use no digital technology at all. Almost the same number of firms (24.7 per cent) use only one digital technology. Over one in five firms (21.3 per cent) use two digital technologies, with 17 and 8 per cent of firms using three and four digital technologies respectively.

Prior to 2012, the diffusion of digital technologies among micro-businesses was relatively low. For instance, web-based accounting software, CAD and E-Commerce were the most commonly used digital technologies, with approximately one in seven micro-businesses using these technologies in 2012. Fewer than one in ten firms were using cloud computing, and even fewer firms were using CRM, Machine Learning and AI.

Pathways to productivity

We consider how the business characteristics, innovation and adoption behaviour of micro-businesses are linked to their sales per employee, our proxy for labour productivity. Given the cross-sectional nature of our survey data there are limits to this analysis and results in terms of business characteristics and innovation should be interpreted as indicative rather than causal relationships.

As we can establish a clear temporal difference between the date of technology adoption and current turnover per employee, however, these relationships can be regarded as causal. Key results are as follows:

- Being a home-based business, having a larger leadership team, being an exporter and being an organisational innovator are all positively associated with significantly higher levels of sales per employee.
- Within the group of micro-businesses, larger levels of employment, being family owned and having the founder involved are all associated with significantly lower levels of sales per employee.

Our modelling provides strong causal evidence of the impact of digital adoption on the productivity (sales per employee) of micro-businesses when productivity is measured three years after adoption:

Use of cloud-based computing leads to an increase of 13.5 per cent in sales per employee after three or more years;

- CRM use adds 18.4 per cent to sales per employee over three years;
- E-commerce adds 7.5 per cent to sales per employee over three years;
- Web-based accounting software leads to an increase in sales per employee of 11.8 per cent over three years; and,
- Computer aided design leads to a 7.1 per cent increase in sales per employee.

Micro-business Britain

1. Introduction

Micro-businesses (with 1-9 employees) play an important role in all of our lives. They are our plumbers, our builders, our hairdressers and our mechanics. They are also our architects, designers, artists, lawyers and accountants. In 2017, there were 1.11m microbusinesses in the UK, employing around 4.09m people (17.6 per cent of the workforce). This group of firms accounted for £552bn in sales, 14.7 per cent of that by all UK firms.¹⁴

Many micro-businesses start small and stay small. For other entrepreneurs their micro-business is the launchpad for scaling-up. Or, at least, the test-bed for a new business idea or innovation. The Micro-business Britain Survey (Box 1) was designed to shed new light on this diverse segment of the SME population in the UK. This is important because micro-businesses are often excluded from other national and international surveys which might help us understand what drives their growth and productivity. For example, we know very little about the nature of innovation activity in micro-businesses as firms with less than 10 employees are excluded from the flagship UK Innovation Survey. Similarly, micro-businesses are also excluded from the OECD Digital Adoption survey so – until now – we have known very little about the adoption of new technologies by micro-businesses.

The Micro-business Britain project therefore addresses important gaps in our understanding relating to innovation, technology adoption and productivity. It also focuses attention on the individuals – or more correctly the households – which are closely linked to many micro-businesses. What shapes their level of ambition for growth or productivity improvement? How does this influence their investment or engagement with external finance providers? To enrich this insight, the UK survey – which covered 6,200 firms in all parts of the UK – was accompanied by smaller benchmark surveys of micro-businesses in Ireland (1,500) and the US (2,000).

This report provides a preliminary account of the Micro-business Britain survey focussing on regional contrasts in business ambition, innovation and new technology adoption. The report is organised as follows:

- Section 2 profiles the micro-business population highlighting the role of family, home-based businesses and regional diversity within this segment of the SME population.
- Section 3 focuses on ambition: What aspirations do micro-business leaders have for their business? For themselves?
- Section 4 relates to innovation. Schumpeterian arguments related to creative destruction give micro-firms a specific role in the innovation process. Is this justified? How does innovation in micro-firms actually work?
- Section 5 brings in technology adoption. Here, we focus on the adoption of a range of digital technologies. How extensive is their adoption in micro-businesses? How is this changing? What are the enablers and barriers to adoption?
- Section 6 explores pathways to productivity in micro-businesses linking firm characteristics, innovation and digital adoption.

¹⁴ Business Population Estimates for the UK and regions 2017, BEIS Table A, page 3. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/663235/bpe_2017_statistical_release.pdf.

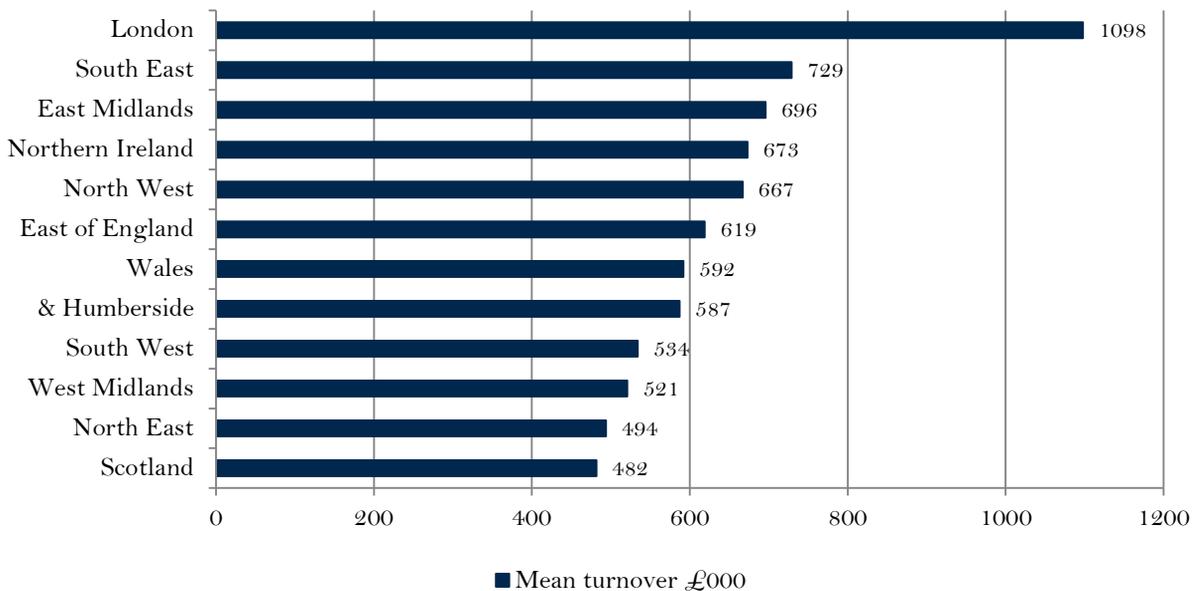
Box 1: The Micro-business Britain Survey

The survey aimed to build a representative picture of established micro-businesses in the UK and collect comparative data on representative groups of micro-businesses in the US and Ireland (Annex 1). The UK survey was undertaken by telephone using a CATI system between 10th January and 21st April 2018 based on a commercially sourced sampling frame. Firms in the 5-9 size-band were oversampled as were firms in Northern Ireland and Wales to prevent particularly small sample sizes in these groups. The focus was on established micro-businesses, i.e., firms with 1-9 employees that have been established for three years or more. Firms were also excluded from the survey if they were branches, divisions or subsidiaries of larger companies, if they were charities or if they were part of the public sector. In the analysis responses are weighted to obtain representative results.

2. Understanding the UK's micro-businesses

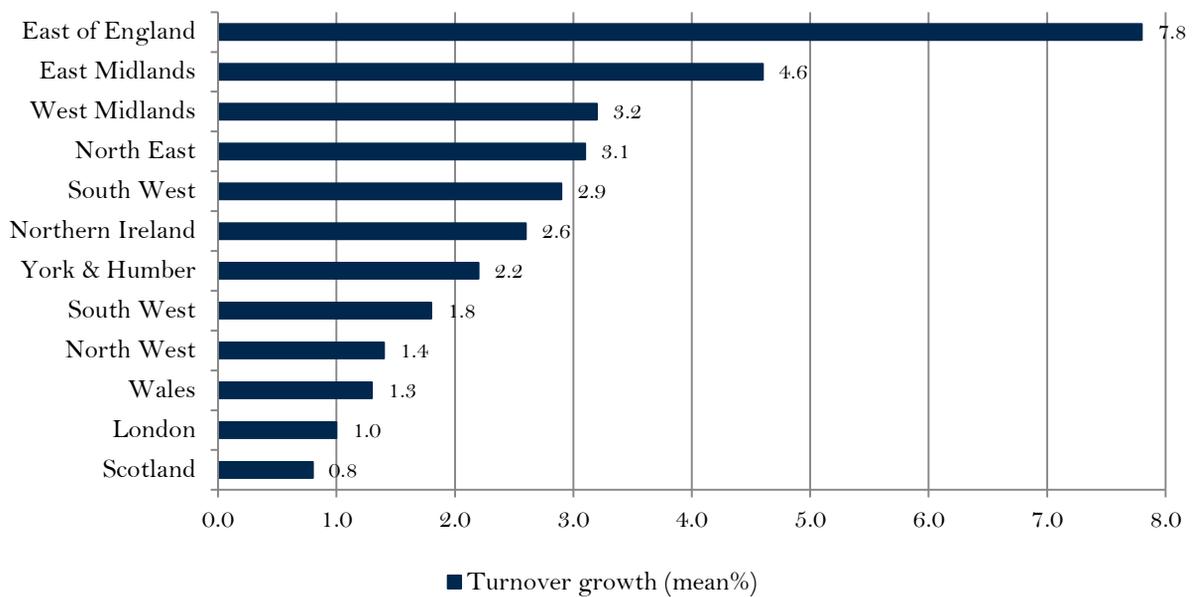
The Micro-business Britain survey enables us to paint a distinct and vivid portrait of UK micro-businesses and their links to the households from which their owners originate. On average micro-businesses have mean employment of 3.34 (median, 4.00) and mean turnover of £664,000 (median, £250,000). Around 85.6 per cent of firms reported generating a profit or surplus in the year prior to the survey. Mean turnover differs significantly by region (Figure 2.1).

Figure 2.1: Mean turnover of micro-businesses: by region



Micro-businesses in each UK region reported positive turnover growth with growth across the UK averaging 2.8 per cent. This varied significantly both within and between regions, however, with the highest average turnover growth rate in the East of England (Figure 2.2).

Figure 2.2: Average turnover growth: By region



On average businesses in the survey had been established for more than 22.8 years, with only 26.4 per cent either 10 years old or newer. This age distribution may have significant impacts on technology adoption and innovation with a number of studies suggesting that innovation levels fall as businesses mature.¹⁵

More than half of all micro-businesses (53.8 per cent) are home-based, having the same business and residential address. 70.1 per cent of them were family-owned and 59.0 per cent were both family owned and managed. Recent evidence suggests that while family ownership has little performance impact, family management of businesses reduces the sophistication of management practice within firms with significant negative productivity impacts.¹⁶

In the vast majority of micro-businesses (81.9 per cent) the founder was still involved. This may have positive and negative effects. The founder may have deep understanding of a sector and extensive social networks which may have positive performance benefits. In other cases ‘founders disease’ may limit the vision or strategic scope of a business with negative performance implications.¹⁷

34.8 per cent of micro-businesses are led by a single person, while 45.1 per cent of microbusinesses have a leadership team of two. In the remaining businesses where there are three or more members of the leadership team, 37.2 per cent are women and 9.8 per cent from ethnic minority backgrounds.

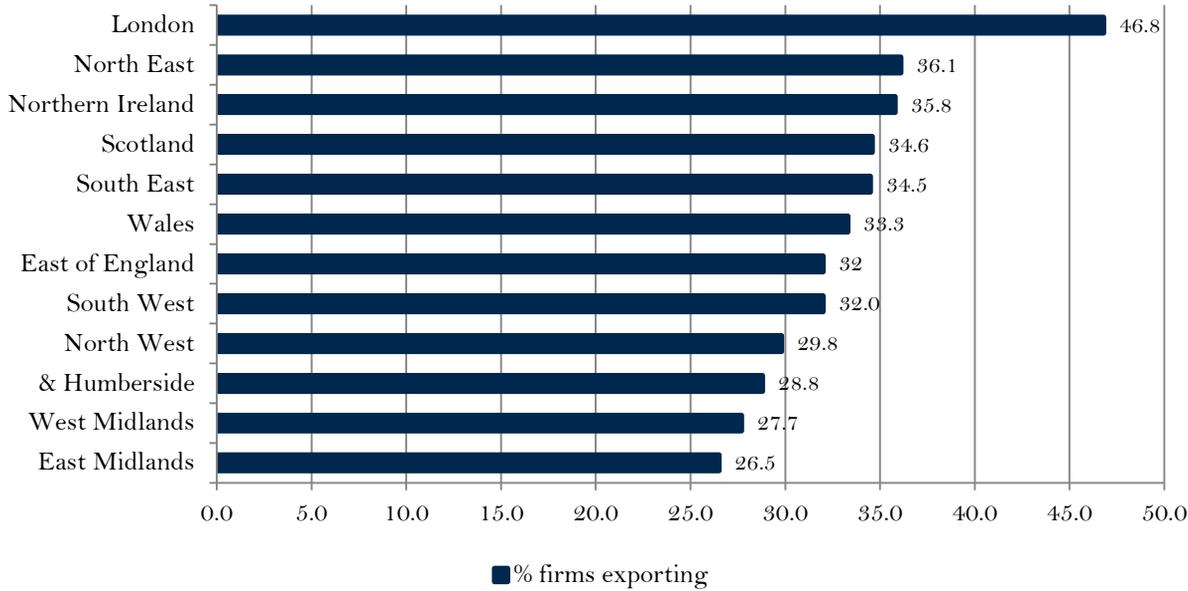
¹⁵ Mazzarol, T., Reboud, S., & Volery, T. (2010). The influence of size, age and growth on innovation management in small firms. *International Journal Of Technology Management*, 52(1-2), 98-117. Balasubramanian, N., & Lee, J. (2008). Firm age and innovation. *Industrial and Corporate Change*, 17(5), 1019-1047.

¹⁶ Awano, G., Heffernan, A., & Robinson, H. (2017). Management practices and productivity among manufacturing businesses in Great Britain: Experimental estimates for 2015.

¹⁷ Willard, G. E., Krueger, D. A., & Feeser, H. R. (1992). In order to grow, must the founder go - a comparison of performance between founder and non-founder managed high-growth manufacturing firms. *Journal of Business Venturing*, 7(3), 181-194.

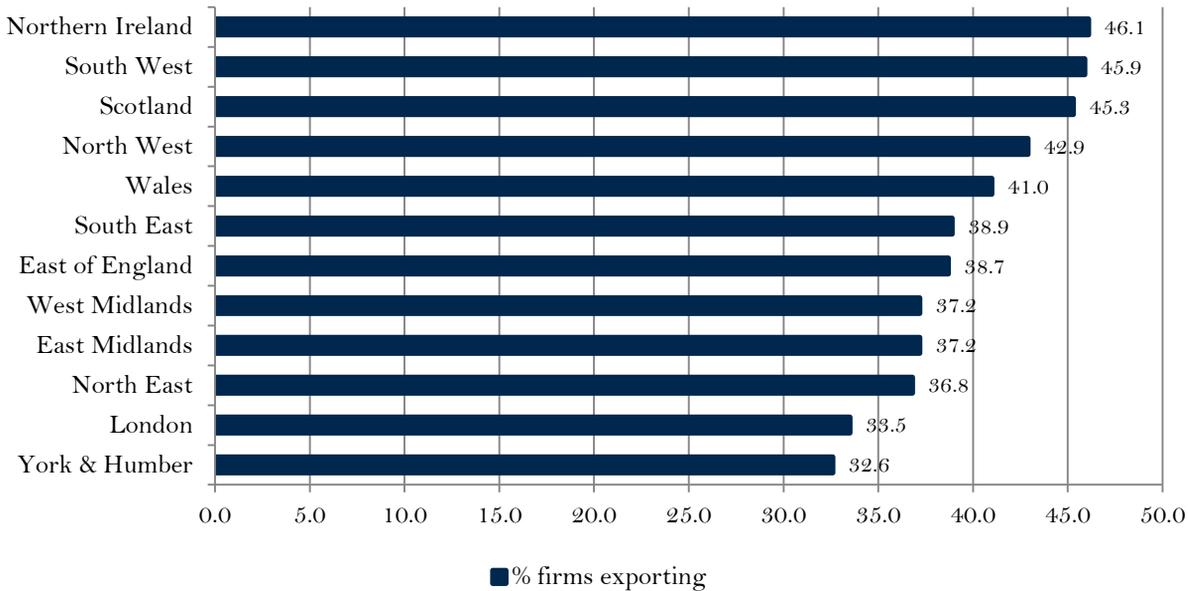
Around a third of micro-businesses are selling to either businesses or consumers outside the UK (33.3 per cent) and on average micro-businesses derive around 8.7 per cent of sales from exports. The proportion of firms exporting differs significantly between regions with London and the North East having the largest proportions of exporting firms (Figure 2.3).

Figure 2.3: Percentage of micro-businesses exporting: By region



External finance was being used by 39.4 per cent of micro-businesses on average with use highest in Northern Ireland. (46.1 per cent) and lowest in Yorkshire and Humber (32.6 per cent) (Figure 2.4).

Figure 2.4: Percentage of micro-businesses using external finance: By region



The picture that emerges is that most micro-businesses are mature, and many are homebased. They are closely related to the families which own and run them, and that in most cases the founder is still involved. Growth in sales has been modest for most firms over the last year with around a third of firms exporting. Nearly two-thirds of firms rely solely on internal funding, with around a third using external funding sources. In the next section we consider the business and personal ambitions of the owner-managers of micro-businesses.

3. A story of ambition – for the individual, for the business

Previous studies have strongly linked owner-managers growth ambition to the subsequent growth and performance of the firm ¹⁸. In the Micro-business Britain survey we use a new set of ambition questions which reflect the dual structure adopted in some business development programmes. In the Dutch Growth Accelerator programme, for example, attendees are asked to reflect on their own individual aspirations for the future and separately on their aspirations for the future of their business ¹⁹. Given the nature of micro-businesses these two sets of aspirations are often strongly interlinked but for many ownermanagers their aspirations for the business will be a means towards a more personal endpoint.

Looking first at respondents' aspirations for their micro-business we consider the proportion of respondents ranking each aspiration as 'important' or 'very important'. This suggests a sharp distinction between 73.7 per cent of all respondents who aim to 'keep their business similar to how it operates now', and a more ambitious 22.1 per cent of all respondents who aim to build a 'national or international business' (Figure 3.1). Other more operational aspirations – employee engagement, HR practices, social benefits - fall between these two extremes. 30.9 per cent of all micro-business owners aim 'to grow their business rapidly and profitably with view to exit'. As Figure 3.1 shows we also see very similar profiles of business objectives for male and female micro-business owners.

Individuals' personal ambitions suggest a rather different set of priorities, with a marked emphasis on 'freedom' and 'flexibility' (Figure 3.2). This is consistent with much of the research literature on self-employment and entrepreneurship which stresses the financial as well as the non-financial benefits of being your own boss. The financial aspect of running a business proves important for some however with 41.3 per cent of all business owners regarding it as important 'to build great wealth or a very high income'. Again, in terms of individual's personal ambitions we see a marked similarity between male and female micro-business owners.

¹⁸ 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).

¹⁹ OECD. (2012). *An International Benchmark analysis of public programmes for high growth firms*. Paris.

Figure 3.1: Business objectives: By gender of business owner

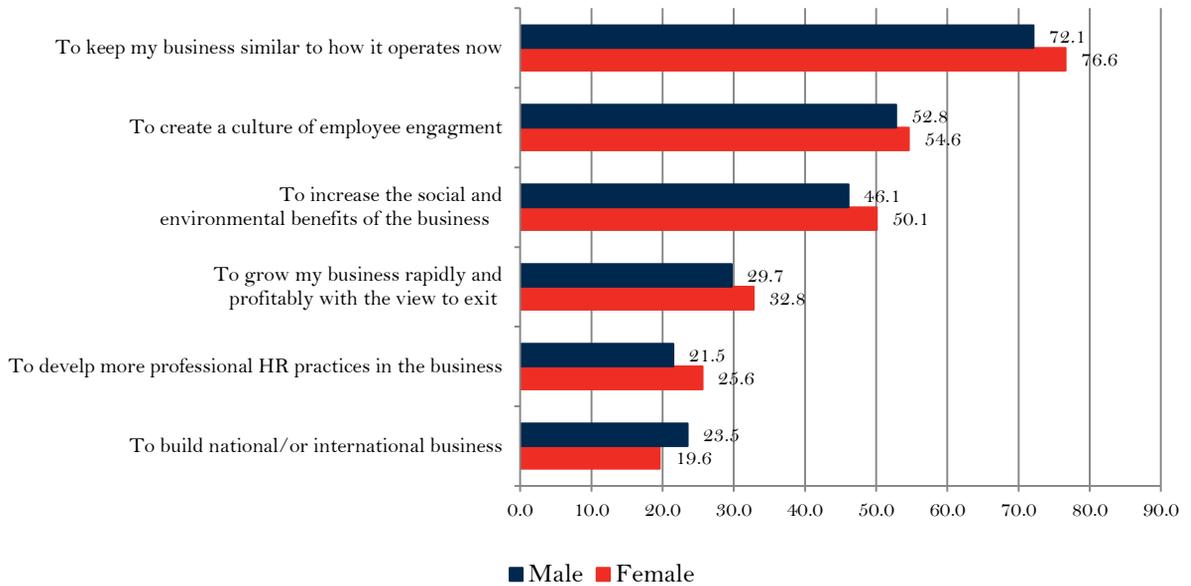
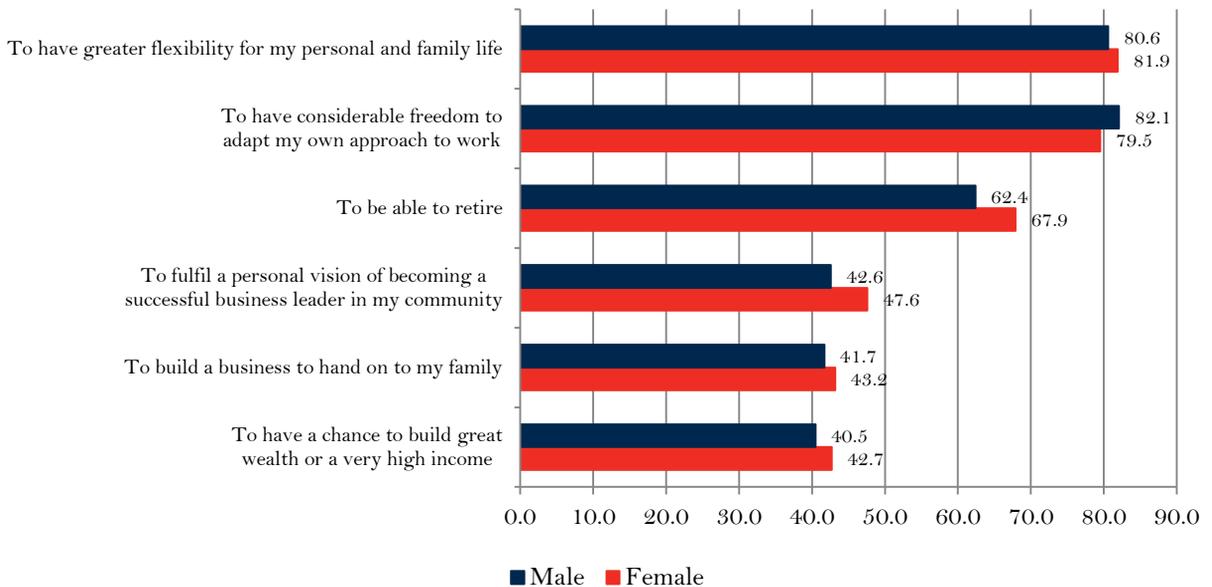
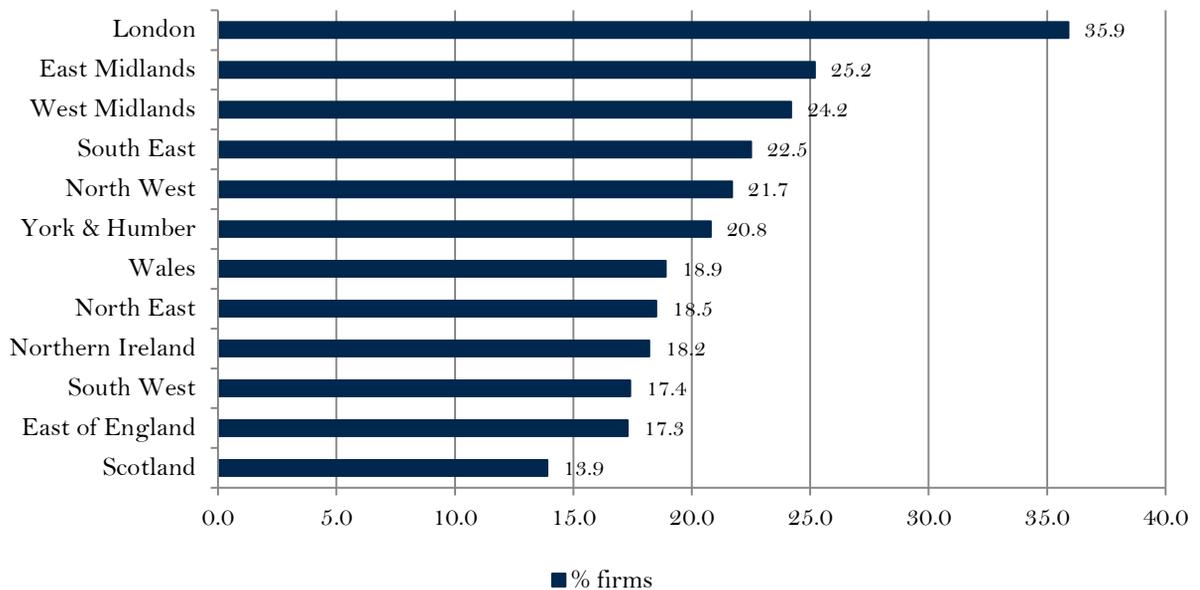


Figure 3.2: Personal ambition: By gender of business owner



While gender differences in levels of ambition are relatively small we see larger regional differences in the proportions of micro-business owners aiming to grow their business (Figure 3.3). In terms of this metric London stands out with 35.9 per cent of business owners aiming to achieve national and/or international recognition. Levels of growth ambition among micro-businesses are markedly lower in other regions

Figure 3.3: Proportion of micro-businesses aiming ‘to build a national or international business’: By region



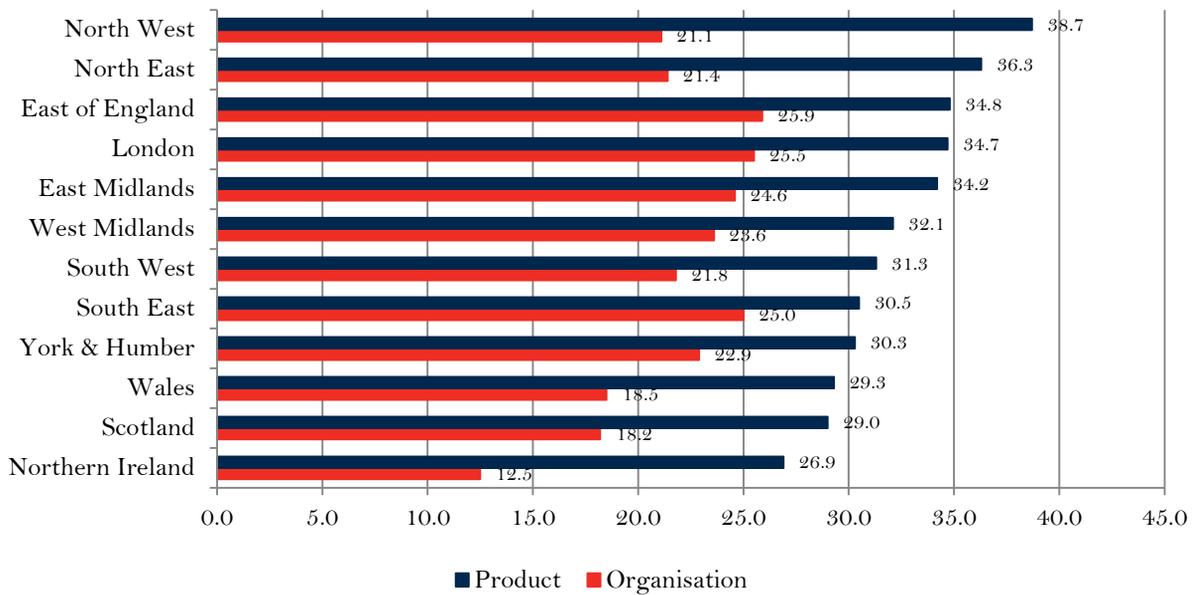
4. Innovation – investments and outcomes

Innovation is a process through which firms’ investments in R&D and other intangibles such as design are integrated with externally sourced knowledge to generate new products, services or business models. In the Micro-business Britain Survey, we follow the approach taken in the UK Innovation Survey (and EU Community Innovation 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. Here we focus on two main questions: How active are micro-businesses across the UK in terms of innovation? And, secondly, how are businesses innovating? Does this involve R&D, or collaboration with other organisations? In each case we consider the regional geography of micro-business innovation across the UK.

Across the whole sample of micro-businesses 32.4 per cent reported introducing a new or significantly improved product or service over the previous three years. This proportion varied significantly by region, however, from a high of 38.7 per cent in the North West to a low of 26.9 per cent in Northern Ireland. A lower proportion of firms (23.0 per cent) reported organisational changes or changes in business processes, again with strong regional variation (Figure 4.1).²⁰

²⁰ Interestingly the correlation between product/service and organisational innovation is relatively weak at 0.188.

Figure 4.1: Percentage of innovating micro-businesses: By region



The nature of the innovations made by firms varied significantly, however, with some firms introducing new and improved products:

‘We increased the range of stock and improved customer service and have additional staff’.

‘We implemented new product design adding new applications to products and services: the company is starting to operate outside of the EU’.

Or, developing new service offerings:

‘Our magazines are now digital, this helps attract customer due to the embedded video advertising’.

‘We developed gamification - the application of game theory to a business environment’.

Other firms were innovating by adopting new approaches to the products and services they trade:

‘We are buying more ethically produced and fair trade stock’.

The nature of organisational change among micro-businesses also varied widely with changes in internal practices, external relationships and new technology adoption. In terms of changes in management practices and external relationships firms highlighted:

‘... job sheets. More streamlined. Every job that goes through now has a worksheet put to it so we can table the jobs up to make sure correct price is met and there is quality and traceability which customers like. Streamlining is the process where from coming through the door it's traceable and more organised on the shop floor’.

‘Changing the way we work with suppliers. We couldn't rely on partners. Now we are more independent to have more control and provide better customer service’.

‘We've gained an association with a world leading academic in our subject’.

In terms of new technology adoption, many firms reported:

‘Going digital in everything that we do’:

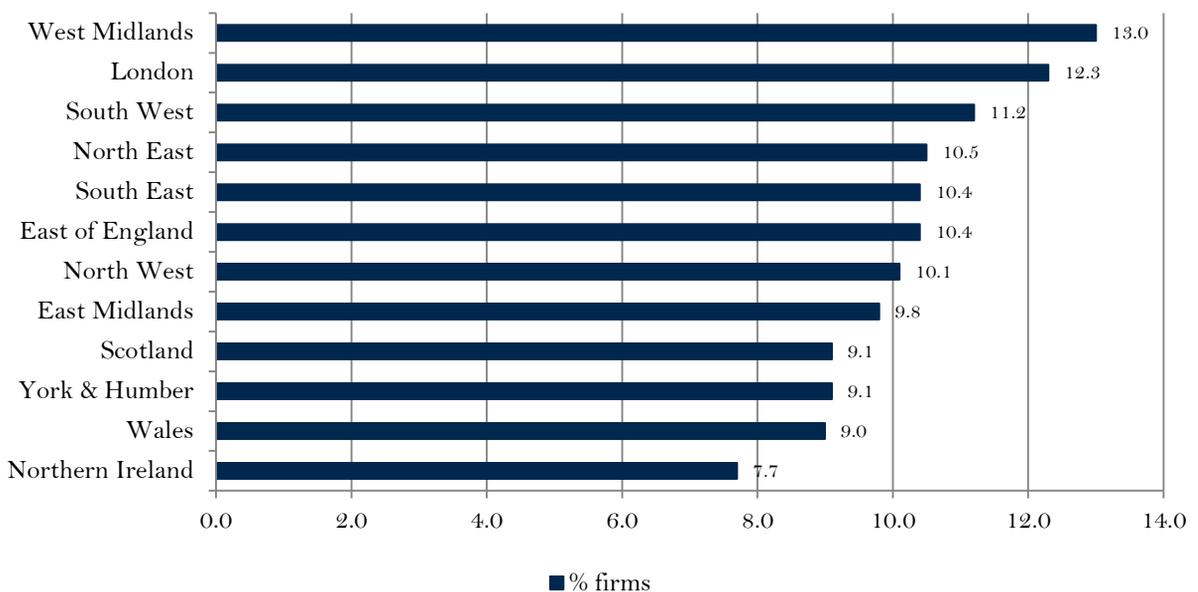
‘We looked at how to digitalise the business. Using digital technology and introducing new products to new markets’.

‘We are using the cloud internet’.

‘The most appropriate change I made is computerising everything such as stocks and accounts’.

Another aspect of firms’ innovation is whether they were developing new to the market innovation (i.e. introduced before their competitors). New to the market innovation may give firms first mover advantage in the market place and deliver higher returns than more incremental product or service improvement. However, the risks can be greater and product and service development more difficult ²¹. Overall, around 10.6 per cent of micro-businesses reported new to the market innovation in products or services in the three-years prior to the survey. This varied from a high of 13.0 per cent in the West Midlands to 7.7 per cent in Northern Ireland (Figure 4.2).

Figure 4.2: Percentage of micro-businesses reporting new to the market innovation



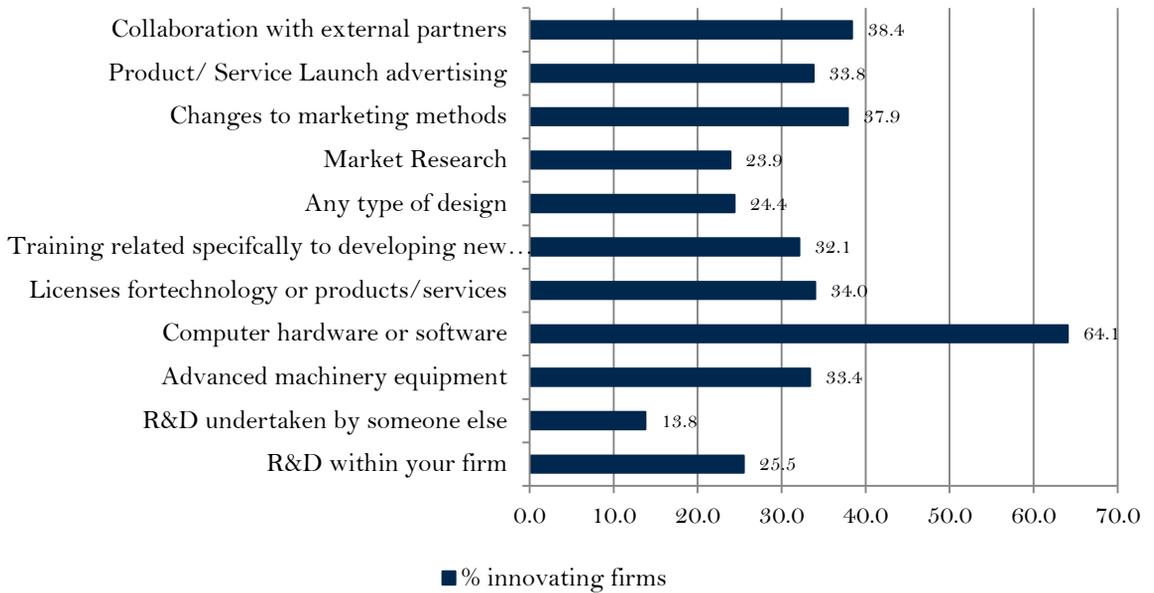
Innovations, whether new to the market or incremental, are the end of a business process which may involve R&D, other intangible investment and knowledge sourced from partners or collaborators. Next, we consider the investments micro-businesses are making to drive their innovation activity and who they are collaborating with. Only around 1:4 microbusinesses reporting innovation were actually undertaking R&D (Figure 4.3). In other words, most micro-business innovation is not linked to R&D but other types of intangible or knowledge investments. Most common among these investments were computer hardware or software (64 per cent of innovators) and advanced machinery (33.4 per cent of innovators) (Figure 4.3).

Collaboration with innovation partners provides another route through which microbusinesses can access new knowledge for innovation and share costs and risks ²². Despite the potential advantages only around 38.4 per cent of innovating micro-businesses had collaborated for innovation during the three years prior to the survey.

²¹ Ulhoi, J. P. (2012). Modes and orders of market entry: revisiting innovation and imitation strategies. *Technology Analysis & Strategic Management*, 24(1), 37-50.

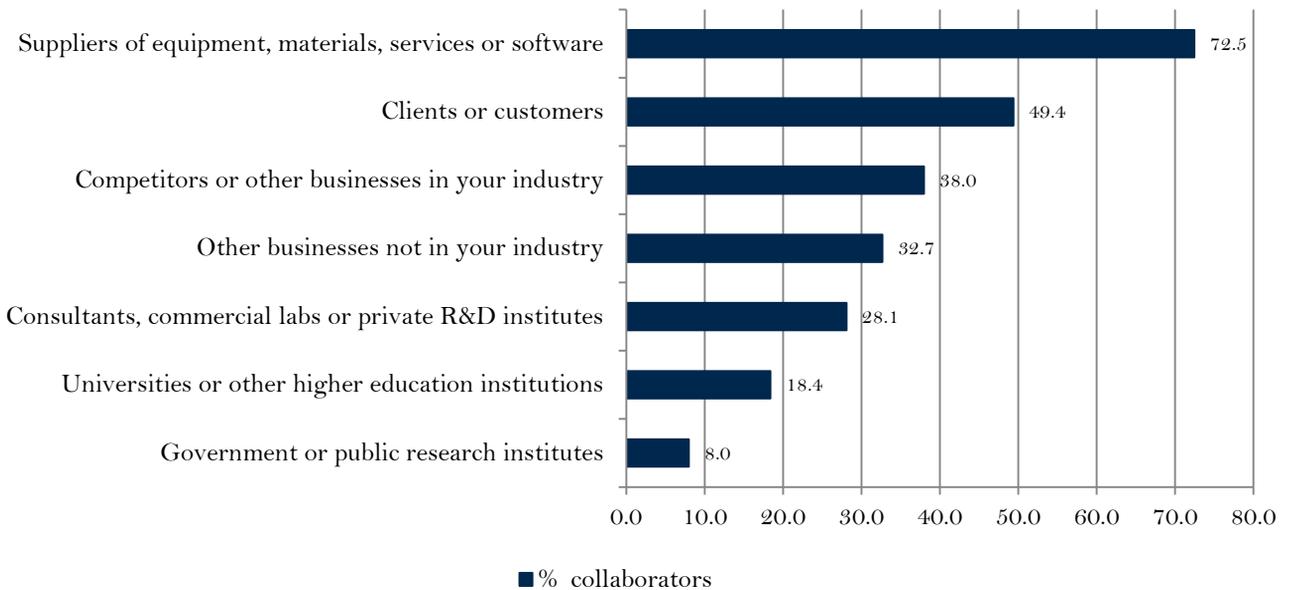
²² Roper, S., & Hewitt-Dundas, N. (2017). Investigating a neglected part of Schumpeter’s creative army: what drives new-to-the-market innovation in micro-enterprises? *Small Business Economics*, 49(3), 559-577.

Figure 4.3: Intangibles investment to support innovation: % innovating micro-businesses



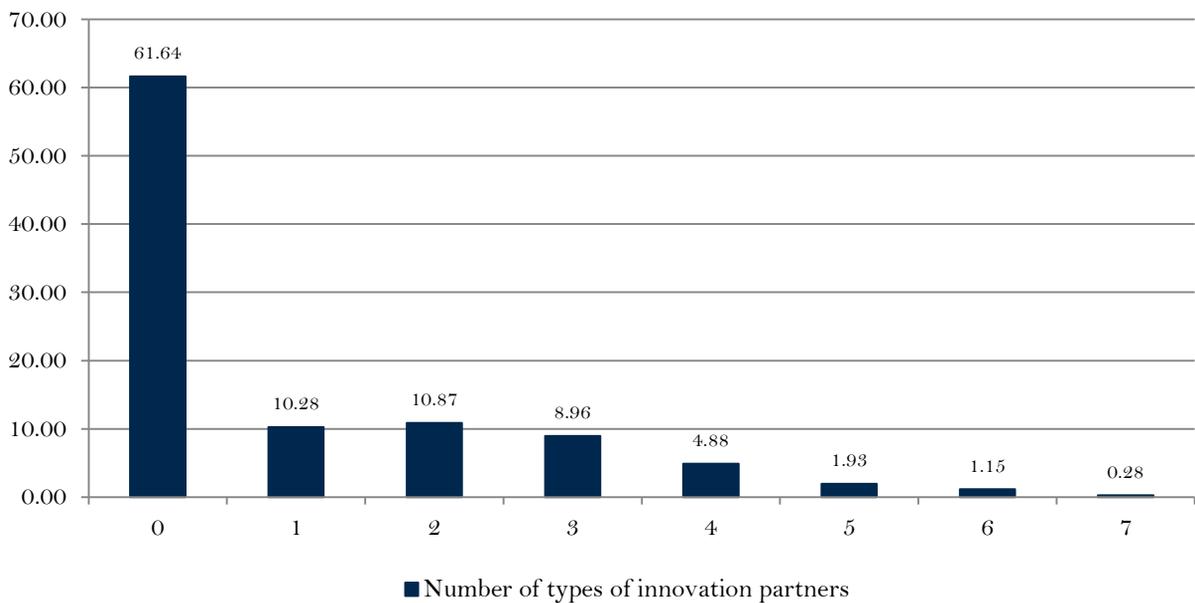
Collaborative micro-business innovators are most likely to be working with suppliers or customers as part of their innovation activity (Figure 4.4). 1:3 micro-businesses which were collaborating for innovation were working with consultants and 1:5 with universities. This pattern is widely observed in other surveys of open innovation where collaboration up and down supply chains are typically most common.

Figure 4.4: Collaboration for innovation: % of innovators collaborating



One other measure of collaboration which is often used in innovation surveys is an indicator of the ‘breadth’ of firms’ innovation collaboration ²³. This measure counts the number of different partner types with which a firm is working as part of its innovation activity. In the Micro-business Britain survey, we identify seven partner types so this breadth measure takes values from 0 to 7 (Figure 4.5). As indicated previously the majority of innovating micro-businesses are solo innovators with no innovation partners. Having one or two types of innovation partner was most common with relatively few innovating micro-businesses have more than two types of partner.

Figure 4.5: Breadth of collaboration among innovating micro-businesses



5. Adoption of digital technologies

5.1 Adoption

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

²³ Laursen, K., & Salter, A. (2006). Open for Innovation: The role of openness in explaining innovation performance among UK manufacturing firms. *Strategic Management Journal*, 27, 131-150.

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.

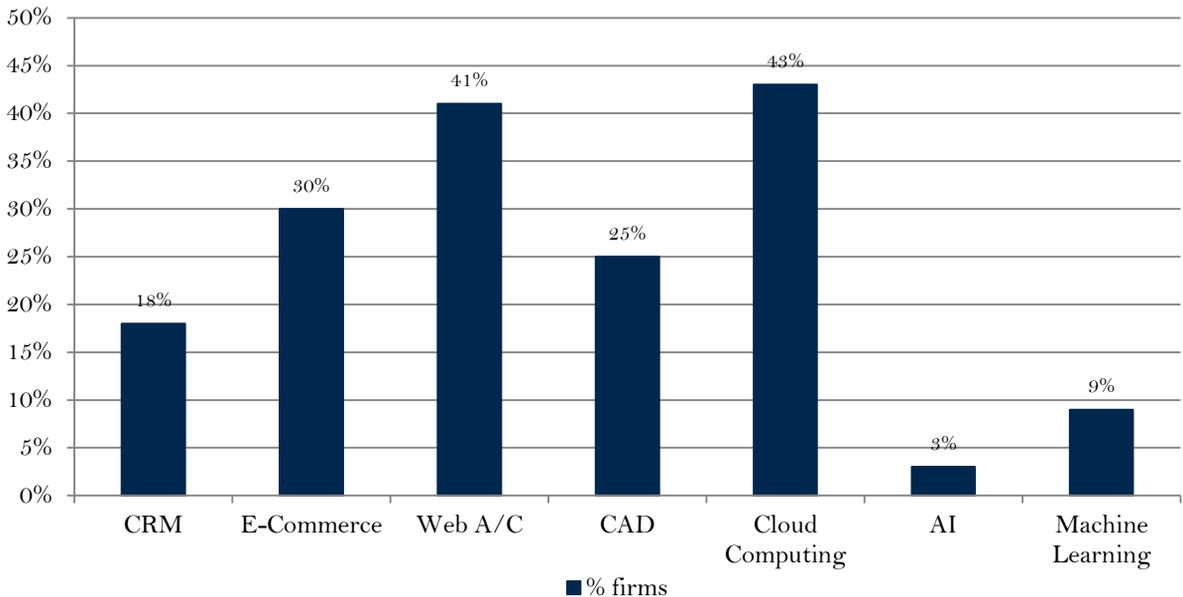
Cloud computing involves the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer.

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.

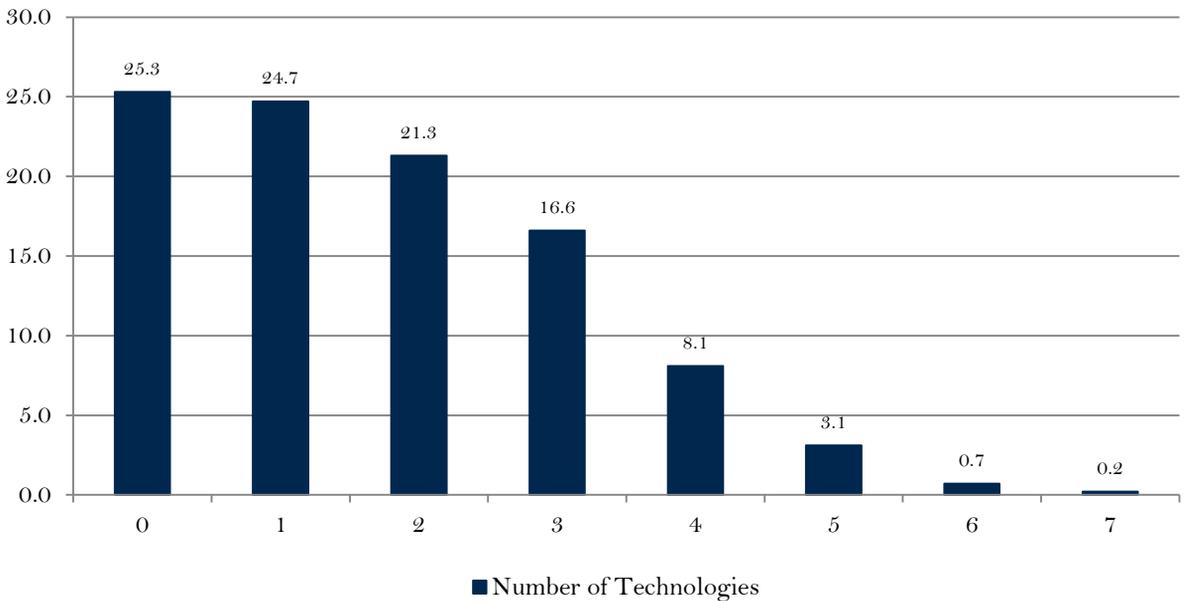
Web-based account software and cloud computing are the most commonly used digital technologies among UK micro-businesses, with over 40 per cent of firms using these technologies. E-Commerce is used by 30 per cent of firms, with 25 and 18 per cent of firms using CAD and CRM respectively. 9 per cent of firms use Machine Learning technologies, and only 3 per cent of micro-businesses are using AI (Figure 5.1).

Figure 5.1: Digital adoption in micro-businesses



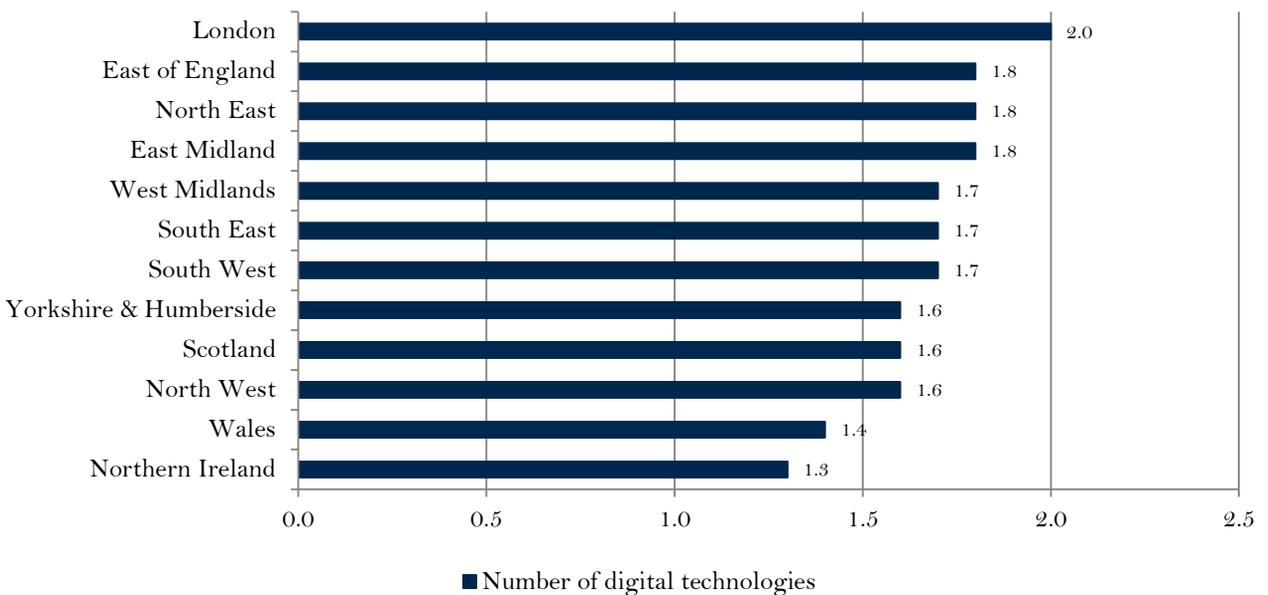
Next, the extent of digital technology use is considered. In other words, how many of the seven technologies are micro-businesses using? One in four firms (25.3 per cent) use none of the digital technologies. Almost the same proportion of firms (24.7 per cent) use only one digital technology. Over one in five firms (21.3 per cent) use two digital technologies, with 17 and 8 per cent of firms using three and four digital technologies respectively. Three per cent of micro-businesses use five technologies, with less than one per cent of firms using more than five technologies (Figure 5.2).

Figure 5.2: Extent of digital adoption by micro-businesses



On average, micro-businesses use 1.7 digital technologies. There is greater use of digital technologies in London, with firms on average using 2.0 digital technologies. The extent of digital technology use is lower in Wales and Northern Ireland, with firms on average using 1.4 and 1.3 digital technologies respectively.

Figure 5.3: Regional breakdown: Extent of digital adoption



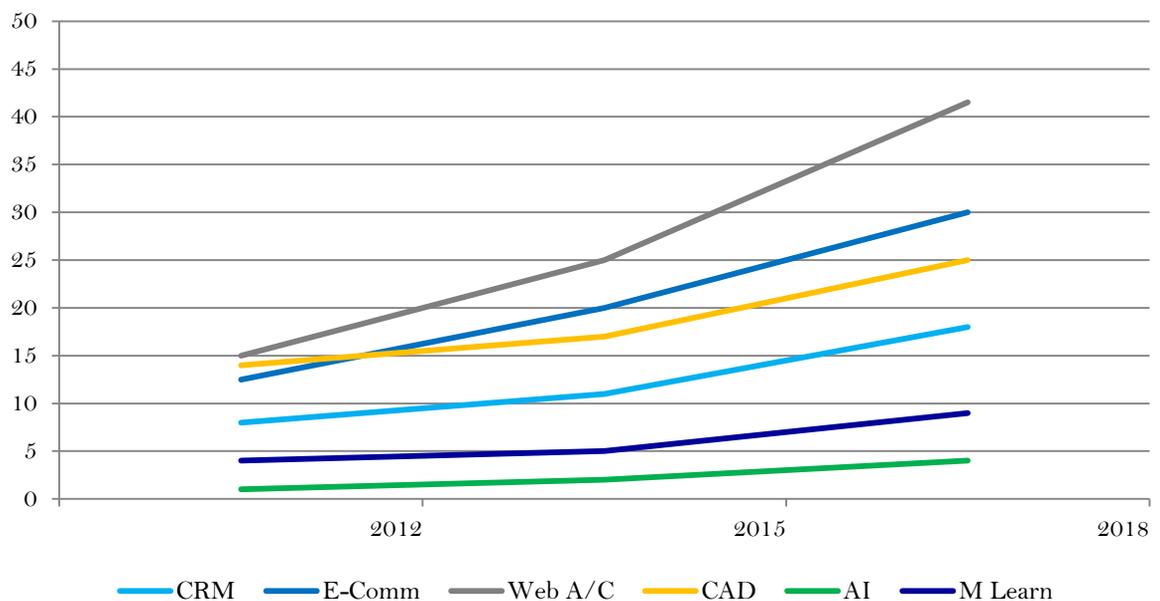
5.2 Trends in Digital Technology Adoption

Prior to 2012, the diffusion of digital technologies among micro-businesses was relatively low. For instance, web-based accounting software, CAD and E-Commerce were the most commonly used digital technologies, with approximately one in seven micro-businesses using these technologies before 2012. Fewer than one in ten firms were using cloud computing, and even fewer firms were using CRM, Machine Learning and AI (Table 5.1 and Figure 5.4).

Table 5.1: Percentage of micro-business adopters of digital technologies

	2012	2015	2018
Customer Relations Management	7%	12%	18%
E-Commerce	12%	21%	30%
Web-based Accounting Software	15%	25%	42%
Computer Aided Design	13%	19%	25%
Cloud Computing	9%	22%	43%
Artificial Intelligence	1%	2%	3%
Machine Learning	3%	5%	9%

Figure 5.4: Digital Adoption in UK Micro-businesses 2012-2018



By 2018, we see increased diffusion of digital technologies among micro-businesses, and as is evident from the diffusion curves some technologies in particular have gained popularity (Figure 5.4). The most commonly used digital technologies by micro-businesses are cloud computing and web-based accounting software with over 40 per cent of firms using these technologies. More than one in three and one in four firms use E-Commerce and CAD respectively. Use of CRM and Machine Learning has increased significantly since 2012 and, in 2018, almost one in five firms are using CRM and one in ten firms are using Machine Learning. Diffusion of AI remains low at only 3 per cent of micro-businesses.

5.3 Perceived Advantages and Disadvantages of Using Digital Technology

Micro-businesses which use digital technologies highlighted many positives of their use, such as cost-savings, efficiency, flexibility and resilience (Box 3). Indeed, for some firms, digital technology is central to their business model, and of particular importance for improved market access. However, some users of digital technology are less convinced of their benefits, highlighting security, cost and time pressures, skills shortages and stress as downsides of their use. This is not surprising given firms can face difficulties in the effective implementation of technologies, creating the potential for disruption effects, learning-byusing effects and time-lags before benefits are realised.²⁴

Box 3: Digital Adoption: Perceived Advantages and Disadvantages

Advantages	
Cost-savings	Cloud technologies have saved us £300 on our electric bill; reduced operating costs
Efficiency	better record keeping; labour saving; can easily recognise customers their frequency or ordering, likes and dislikes
Flexibility	Employees can see what is going on in the business; “can work from home, abroad, different sites
Resilience	made the business a lot more resilient
Business Model	Inherent to our business model; necessary to the business; can’t do the job without
Market Access	Web has given us global reach; 90% of our sales are through the computer; CRM has extended our customer base and generated leads
Disadvantages	
Security	It’s putting data in third party hands; Don’t trust them
Costly	increased costs; not made much difference
Time Consuming	it has complicated everything; Made it slower due to poor internet connection; made it a lot more complicated; what takes 10 minutes takes a lot longer to do now
Skills	It’s hard to get it working; don’t understand them Everything is more stressful for me to be honest; Everything is more stressful now
Stressful	I’m using e-commerce; just a lot of hassle

²⁴ Tyre, M.J. and O. Hauptman. 1992. Effectiveness of Organizational responses to technological change in the production process. *Organization Science* 3:301-320. Bourke, J & S. Roper. 2016. AMT adoption and innovation: An investigation of dynamic and complementary effects. *Technovation*, 55-56: 42–55.

Some of the one in four micro-businesses that have not adopted any digital technologies indicated why: no need for digital technology (*'Computers don't cut hair'; 'we make sandwiches'*); dislike of digital technology (*'Not tech-minded'; 'old school'; 'I loathe technology'*); scale (*'My business isn't big enough to do all these high-tech things'*) and access to internet and broadband (*'Issues with broadband availability'; 'Don't have the internet'*). Previous research has shown that firm size, firm vintage, skills levels and organisational culture influence successful technology implementation, while R&D investments and market conditions appear less important. ²⁵

6. Pathways to Productivity

In this section we consider how the business characteristics, innovation behaviour and adoption behaviour of micro-businesses are linked to sales per employee, our proxy for labour productivity. Previous research has demonstrated, in general, the positive impact of technology adoption on employment, innovation and productivity ²⁶. While much of this work centres on larger businesses, a study of Canadian manufacturing SMEs previously revealed positive growth effects from technology adoption by enabling product innovation, albeit at the expense of productivity by impeding process innovation. ²⁷

Given the cross-sectional nature of our survey data there are limits to this analysis and results in terms of business characteristics and innovation should be interpreted as correlations or measures of association rather than causal relationships. As we can establish a clear temporal difference between technology adoption (prior to 2015) and current turnover per employee, however, these relationships can be regarded as causal.

Turnover per employee (log) is here used as the dependent variable with a range of firm characteristics discussed earlier as explanatory factors. We include each form of digital adoption prior to 2015 in a separate equation in Table 6.1. Each model also includes sectoral dummy variables to control for sectoral differences. In terms of the firm characteristics the key results are as follows:

- Being a home-based businesses, having a larger leadership team, being an exporter and being an organisational innovator are all positively associated with significantly higher levels of sales per employee.
- Within the group of micro-businesses, larger levels of employment, being familyowned and having the founder involved are all associated with significantly lower levels of sales per employee.

Our modelling provides strong causal evidence of the impact of digital adoption on the productivity (sales per employee) of micro-businesses when productivity is measured three years after adoption (Table 6.1):

- Use of cloud-based computing leads to an increase of 13.5 per cent in sales per employee after three or more years;
- CRM use adds 18.4 per cent to sales per employee over three years;
- E-commerce adds 7.5 per cent to sales per employee over three years;
- Web-based accounting software leads to an increase in sales per employee of 11.8 per cent over three years; and,
- Computer aided design leads to a 7.1 per cent increase in sales per employee.

Other digital applications (artificial intelligence and machine learning) have negative impacts on sales per employee but this may reflect low levels of adoption prior to 2015 or the costs of being a very early adopter.

²⁵ Zammuto, R.F. and E.J. O'Connor. 1992. Gaining advanced manufacturing technologies benefits – the roles of organization design and culture. *Academy of Management Review* 17:701-728; Battisti, G.; H. Hollenstein; P. Stoneman; and M. Woerter. 2007. Inter and Intra Firm Diffusion of ICT in the United Kingdom (UK) and Switzerland (CH): An Internationally Comparative Study base on Firm-Level Data. *Economics of Innovation and New Technology* 16:669-687; Arvantis, S. and H. Hollenstein. 2001. The Determinants of the Adoption of Advanced Manufacturing Technology. *Economics of Innovation and New Technology* 10:377-414.

²⁶ Bartelsman, E.; G. Van Leeuwen; and H. Nieuwenhuijsen. 1998. Adoption of Advanced Manufacturing Technology And Firm Performance In The Netherlands. *Economics of Innovation and New Technology* 6:291312; Barge-Gil, A.; M. Jesus Nieto; and L. Santamaria. 2011. Hidden innovators: the role of non-RD activities. *Technology Analysis & Strategic Management* 23:415-432. Bourke, J & S. Roper. 2016. AMT adoption and innovation: An investigation of dynamic and complementary effects. *Technovation*, 55-56: 42-55.

²⁷ Raymond, L.; A.-M. Croteau; and F. Bergeron. 2009. The Integrative Role of IT in Product and Process Innovation: Growth and Productivity Outcomes for Manufacturing. In *Enterprise Information Systems-Bk*, ed. J. Filipe and J. Cordeiro, 27-39.

7. Next steps

The analysis reported here provides a first, and partial, look at the Micro-business Britain survey data. Over the coming months we propose to undertake further analysis using the data to explore the drivers of micro-business performance in more detail as well as to understand the behaviour of specific groups of micro-businesses. For example, the survey includes detailed indications of the household structure from which the owner-manager of each micro-business comes. Given the close inter-relationship between many of these businesses and the family, this context may be important in shaping ambition and future growth. Other analyses will focus in more detail on individual and business resilience and how the psychological resilience of the individual, as measured by the Connor-Davidson scale, is related to business strategies and growth. We will also explore the dynamics of adoption and how past adoption of digital technologies drives current performance.

We welcome your thoughts and comments on the survey and any ideas you may have for interesting research areas or topics.

Table 6.1: Models of value added per employee: all micro-businesses

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Employment (no)	-0.095***	-0.095***	-0.094***	-0.095***	-0.094***	-0.094***	-0.094***
	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
Firm age (years)	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
Home based (0/1)	0.213***	0.209***	0.214***	0.213***	0.212***	0.212***	0.213***
	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032
Family owned (0/1)	-0.059*	-0.055	-0.060*	-0.062*	-0.055	-0.059*	-0.059*
	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
Founder involved (0/1)	-0.099**	-0.097**	-0.100**	-0.101**	-0.100**	-0.097**	-0.096**
	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045
Leadership team (size)	0.130***	0.130***	0.130***	0.129***	0.131***	0.133***	0.133***
	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015
Exporter (0/1)	0.158***	0.161***	0.160***	0.164***	0.164***	0.168***	0.167***
	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
External finance use (0/)	-0.026	-0.027	-0.027	-0.027	-0.026	-0.026	-0.025
	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032
Product/service innovator (0/1)	-0.005	-0.004	0	0	0	0.005	0.003
	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
Organisational innovator (0/1)	0.144***	0.141***	0.148***	0.146***	0.149***	0.151***	0.150***
	-0.037	-0.037	-0.037	-0.037	-0.037	-0.037	-0.037
Cloud-based computing	0.135***						
	-0.038						
CRM database use (0/1)		0.184***					
		-0.049					
E-commerce (0/1)			0.075**				
			-0.038				
Web-based accounting (0/1)				0.118***			
				-0.035			
Computer aided design (0/1)					0.071*		
					-0.04		
Artificial intelligence (0/1)						-0.204*	
						-0.115	
Machine learning (0/1)							-0.07
							-0.068
Constant term	11.551***	11.562***	11.567***	11.556***	11.560***	11.567***	11.567***
	-0.101	-0.101	-0.101	-0.101	-0.101	-0.101	-0.101
N	4975	4975	4975	4975	4975	4975	4975
bic	14998.408	14996.865	15007.109	14999.643	15007.857	15007.856	15009.893

Notes: Standard errors in parentheses. * denotes significance at 1 per cent; ** at 5 per cent; and, *** at 1 per cent. All models include sectoral dummy variables. Observations are weighted to give representative results.

Annex 1: The Micro-businesses Britain Survey

A1.1 Introduction

The aim of the Micro-business Britain survey was to provide a representative sample by sector and region, although there was be over-sampling of businesses with 5-9 employees. Micro-businesses were defined as having 1-9 employees. This definition excluded owners and partners but included temporary staff. Businesses were additionally screened to ensure: (a) they had been trading for at least 3 years; (b) they were not branches or subsidiaries of larger businesses; (c) they were not charities or part of the public sector. The survey was conducted using Computer Assisted Telephone Interviewing (CATI). Within each business, a member of the senior management team was sought. In total, 6,254 interviews were completed in the UK.

A1.2 Sampling

Contact sample was initially purchased from Dun & Bradstreet's commercial database. All contacts contained telephone numbers. Targets were proposed in an 18-cell grid comprised of nine grouped sectors²⁸ (ABDE, C, F, G, HI, JKL, M, N, PQRS) within two size bands (1-4 employees; 5-9 employees). Those with 5-9 employees were sampled above their actual proportion (target overall was 40% of interviews whereas, in the UK for example, those with 5-9 employees represent 22% of all micro-businesses). Minimum sample sizes of 500 were targeted for Scotland, Wales and Northern Ireland.

The initial ratio of contacts to target interviews was 5:1, but additional contacts were required because of an unexpectedly high refusal rate, relatively high proportions of unobtainable numbers, and a higher than anticipated number of businesses screening out. See section 6 for more details. In the latter stages of the survey further contacts were purchased from DBS Data Marketing.

A1.3 Fieldwork

In the UK survey, 131 pilot interviews were conducted between the 30th January and 1st February 2018. The survey was then paused so that questionnaire changes could be made as a result of the pilot. The survey resumed on the 5th February and continued until the 4th May. In total, 6,254 CATI interviews were completed an overall response rate of around 9 per cent (Table A1.1). In the UK, 527 interviews were achieved in Scotland, 515 in Wales and 495 in Northern Ireland. The remaining 4,717 were in England.

²⁸ Using SIC 2007 definitions. See Table 1 for further definition of sectors.

Table A1.1: Profile of achieved interviews – by sector and employee size band

	Interviews	%
ABDE - Primary	369	5.90%
C - Manufacturing	592	9.50%
F - Construction	650	10.40%
G - Retail, wholesale	1099	17.60%
HI - Transport, accommodation, food	669	10.70%
JKL - Information, finance, real estate	793	12.70%
M - Professional, scientific	1038	16.60%
N - Administrative services	507	8.10%
PQRS - Other services	537	8.60%
1-4 employees	3947	63.10%
5-9 employees	2307	36.90%
Total	6254	100.00%

A1.4 Weighting

The objective in each country was to weight the data back to represent the correct profile of micro-businesses by employment size and sector. However, the micro-business survey screens out certain types of organisations that are included in official business statistics, such as charities, subsidiaries of larger organisations, and public-sector organisations. The main source that informed sample targets and weighting was the 2017 Business Population Estimates ²⁹ (BPE), for which micro-business figures are based on the Inter-Departmental Business Register ³⁰ (IDBR). The BPE gives figures for enterprises that are in the private or third sector, and therefore it was only necessary to exclude charities.

Because of the over-sampling in Scotland, Wales and Northern Ireland, it was necessary to create a 72-cell grid (9 sector groups x 2 employment size bands x 4 countries). Estimates of the proportion of charities in each of these cells was determined from the 2017 Longitudinal Small Business Survey (LSBS) ³¹, and these were excluded from the weighting targets. The unweighted and weighted figures and percentages for the UK are shown in Table A1.2

²⁹ <https://www.gov.uk/government/statistics/business-population-estimates-2017>

³⁰ <https://www.ons.gov.uk/aboutus/whatwedo/paidservices/interdepartmentalbusinessregisteridbr>. The figures are largely based on the number of enterprises registered for VAT and/or PAYE.

³¹ <https://www.gov.uk/government/statistics/small-business-survey-2017-businesses-with-employees>.

Table A1.2: Unweighted and weighted figures: UK

	Unweighted			Weighted		
	One to four	Five to nine	Total	One to four	Five to nine	Total
ABDE - Primary	255	114	369	270	53	322
	6.5%	4.9%	5.9%	5.5%	3.8%	5.2%
C - Manufacturing	334	258	592	240	109	349
	8.5%	11.2%	9.5%	4.9%	7.9%	5.6%
F - Construction	424	226	650	712	151	863
	10.7%	9.8%	10.4%	14.6%	10.9%	13.8%
G - Retail, wholesale	697	402	1099	861	320	1181
	17.7%	17.4%	17.6%	17.7%	23.2%	18.9%
HI - Transport, accommodation, food	376	293	669	540	230	770
	9.5%	12.7%	10.7%	11.1%	16.6%	12.3%
JKL - Information, finance, real estate	506	287	793	580	135	715
	12.8%	12.4%	12.7%	11.9%	9.8%	11.4%
M - Professional, scientific	682	356	1038	841	160	1000
	17.3%	15.4%	16.6%	17.3%	11.6%	16.0%
N - Administrative services	333	174	507	445	116	561
	8.4%	7.5%	8.1%	9.1%	8.4%	9.0%
PQRS - Other services	340	197	537	383	109	492
	8.6%	8.5%	8.6%	7.9%	7.9%	7.9%
Total	3947	2307	6254	4871	1383	6254
	100%	100%	100%	100%	100%	100%



The State of Small Business Britain

Part C: Benchmarking Local Growth

Mark Hart, Karen Bonner, Neha Prashar and Michael Anyadike-Danes

UK Local Growth Dashboard

1 Introduction

The UK Local Growth Dashboard has been developed by the Enterprise Research Centre (ERC) and builds on the LEP Growth Dashboard first launched in June 2014. 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. Alongside these metrics it provides some other contextual data for each LEP including the changing sectoral composition of local economies over time.

The Local Growth Dashboard can be used as a source of evidence to inform discussions on priorities in business support concerning small business growth and includes easily understood metrics which can be readily updated on an annual basis. This report is designed to simply present the data for others to use and it is not the intention here to investigate the reasons for these variations as that can be found elsewhere in the research outputs of the ERC and the wider research and policy literature.

The growth metrics which are used in the Dashboard are: ³²

- 3-year survival rates of start-ups (2014-17)
- Proportion of 2014 start-ups that reach £1m+ T/O (2014-17)
- Proportion of £1-2m T/O businesses born before 2013 which grow to £3m+ T/O (2014-17)
- High-Growth Firm (OECD Definition) Incidence Rate (2014-17) – using both the traditional 20% threshold and the revised 10% threshold.
- Small High-Growth Incidence Rate (2014-17) – a metric adopting a methodology advocated to avoid the exclusion of firms with less than 10 employees from the OECD definition
- Productivity Growth metric (2014-17) – a new metric this year looking at firms who growth both in terms of jobs and revenues but have a faster rate of growth in revenues

1.1 Data Sources

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) records ³³. 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 T/O calculations and the site-level BSD for the calculation of new and gross new jobs. All the data contained in this report can be downloaded from the Data Hub on the ERC website.

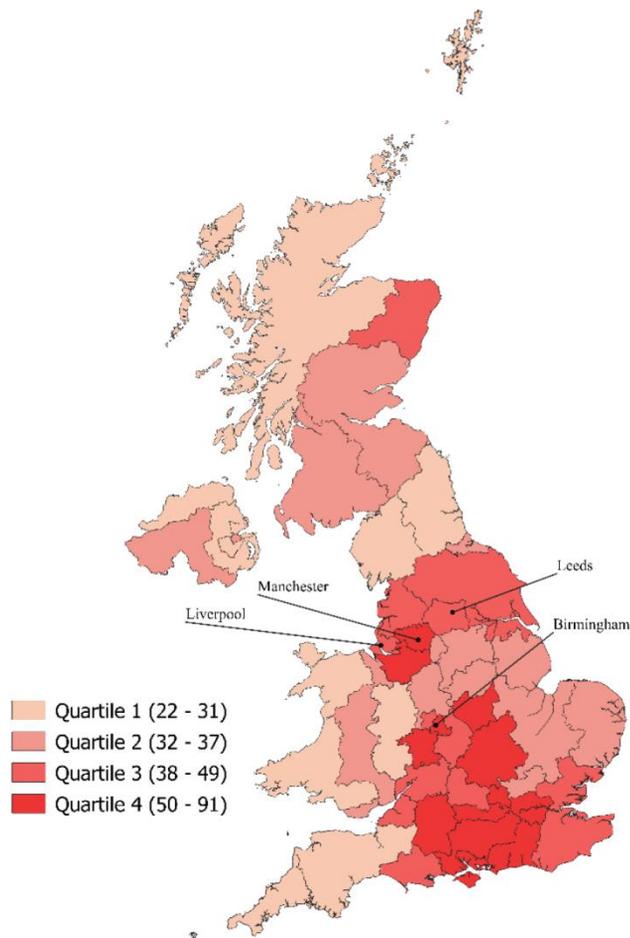
³² Metric Definitions: Start-up is defined as a UK-owned employer firm born in 2017; Start-ups growing to £1m turnover refer to UK-owned firms born in 2014 whose turnover reached at least £1m in 2017; Firms growing to £3m+ turnover refer to UK-owned firms born prior to 2014 that survived to 2017, whose turnover grew from £1-2m in 2014 to at least £3m in 2017; High-Growth is defined by the OECD as annualised average growth in employment of 20% or more over a three year period (2014-17) and restricted to a business having at least 10 employees in 2014.

³³ 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.

2 Growth Metrics

The number of start-ups in an economy is often seen as the headline metric of ‘enterprise’ and ‘entrepreneurial ability’. Start-ups have been rising steadily in recent years but this trend does display some spatial variation across the UK (Figure 1). London and the South East, and especially around the M4 (Swindon and Wiltshire) and M3 (Solent) corridors, have the largest rate of start-ups and there are generally smaller numbers of start-ups as we move north and west. However, there are some notable exceptions in England as there are some LEPs in the Midlands (Worcestershire, South East Midlands and Greater Birmingham and Solihull) and the North West (Greater Manchester) which also exhibit rates of start-up slightly above those in the South East. Generally, start-up rates in Scotland, Northern Ireland and Wales are much lower than in England.

Figure 1: Start-ups per 10,000 Population in the UK (2017): Quartiles



Source: ONS Business Structure Database (BSD)

Since 2013 the ERC research programme has emphasised the importance of small business growth to the objective of driving economic growth and re-balancing the UK economy. So we now turn to a range of business growth metrics which can provide a more fine-grained analysis of the local business dynamic which can inform the development of local, regional and national business support initiatives.

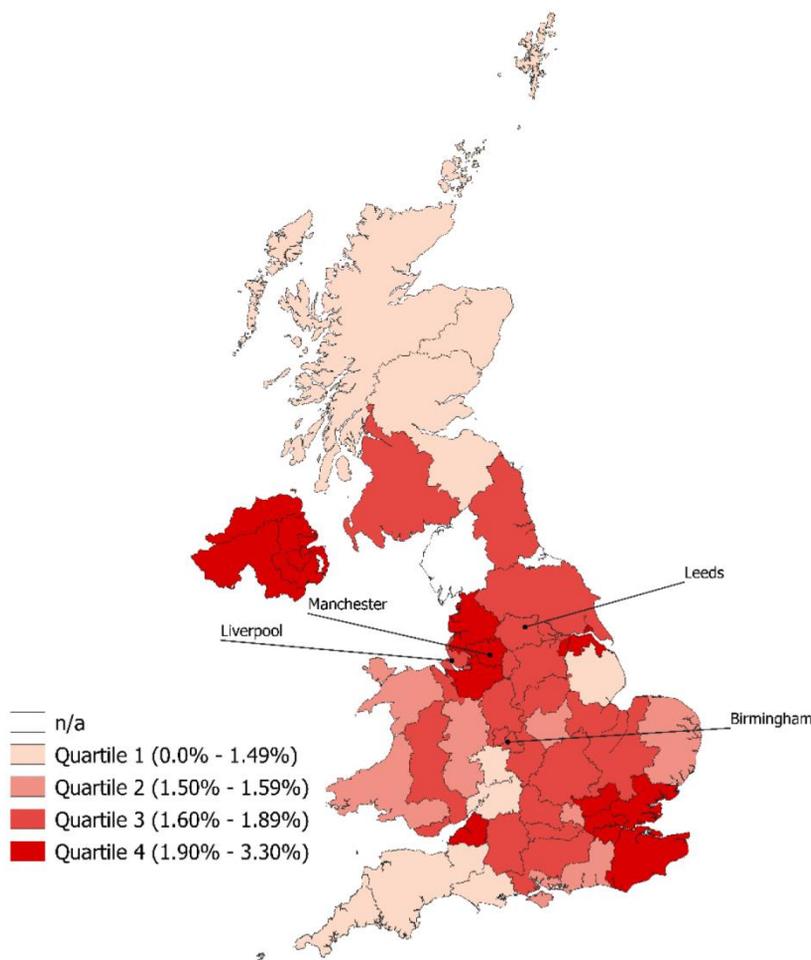
2.1 Growth of Start-ups – Initial Scaling

It is a matter of record that the UK has now a larger number of start-ups than ever before, yet what is less well known is the proportion, if they survive, that go on and generate at least £1m in revenues after 3 years. This threshold, while arbitrary, reflects the ambitions of many entrepreneurs as they strive to sustain and growth their businesses – getting to the ‘first million’ is an often heard metric.

The overall survival rate for this 2014 cohort of start-ups is 54.7% so almost half of all startups do not make it to their third year – a fact that holds for all the cohorts of start-ups we have analysed since 1998.

Figure 2 shows that the proportion of UK-owned start-ups that achieve this early indication of ‘scale’ is very small indeed (1.9% nationally) but that there is a great deal of variation between the Home Nations and across local economic areas or LEAs in England. Northern Ireland stands out as having above average proportions of start-ups (2.7%) achieving the £1m+ threshold after 3 years trading with Outer Belfast and the East of NI (combined) having the highest proportion in the UK (3.3%). This result for Northern Ireland is consistent with the analysis in previous years. Wales (1.5%) and Scotland (1.3%) are below the UK average which is again consistent with a previous cohort of start-ups in 2013.

Figure 2: Proportion of Start-ups Generating £1m+ Revenues after 3 Years in the UK (2017): Quartiles



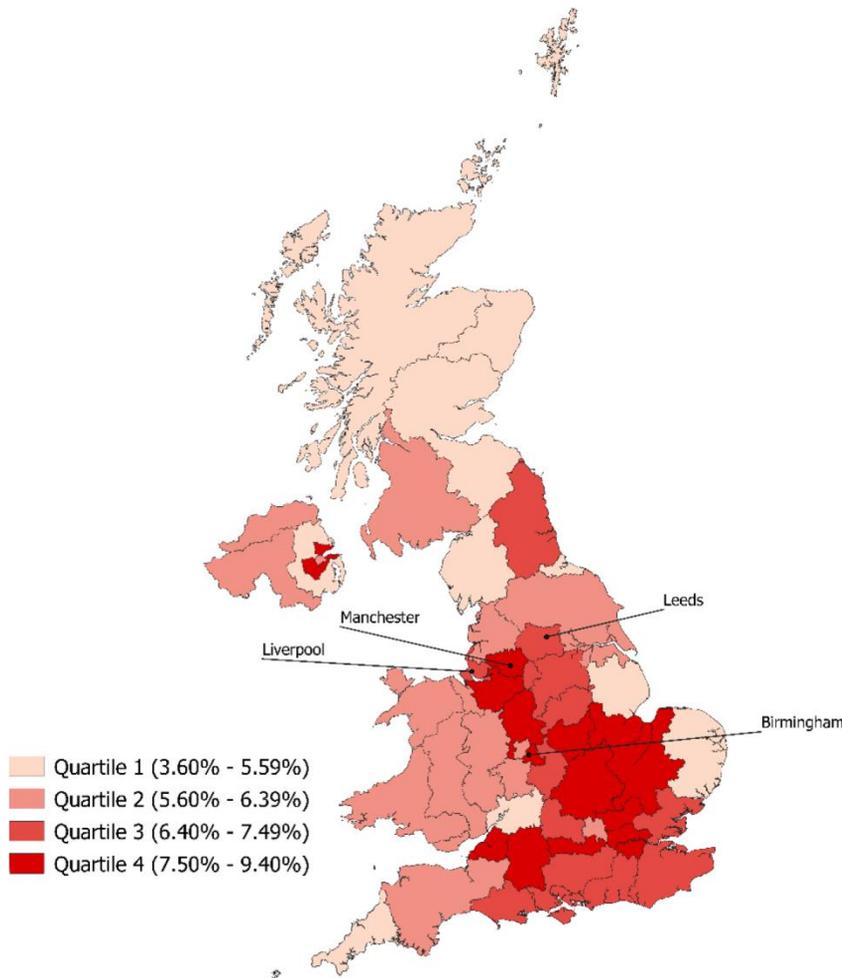
Across the LEPs in England there are a number of above average 'hotspots' including London and the South East, Hertfordshire, Greater Manchester, Cheshire and Warrington, Lancashire and the West of England.

Of note are those local economies with relatively high levels of start-up activity that have the lowest proportions of their start-ups achieving at least £1m in revenues after three years. Worcestershire stands out as an example of this group with start-ups well above the UK average and recorded the highest number outside London. Again, this is consistent with the pattern observed in previous years.

2.2 Growth of Existing Businesses - Stepping Up

Across the UK we observe that 7.2% of existing firms with turnover of £1-2m per annum in 2014 grow to at least £3m turnover in 2017 which is slightly higher to that observed in 2014 and 2015 (i.e., 6%) and marginally higher than in 2016 (7%). This metric of businesses scaling varies greatly across the UK with the three Home Nations of Scotland, Wales and Northern Ireland (except the Outer Belfast region) having lower proportions of these businesses than most areas in England (Figure 3).

Figure 3: Firms (born<2013) turnover £1-2m in 2014 and reaching £3m+ in 2017 in the UK: Quartiles



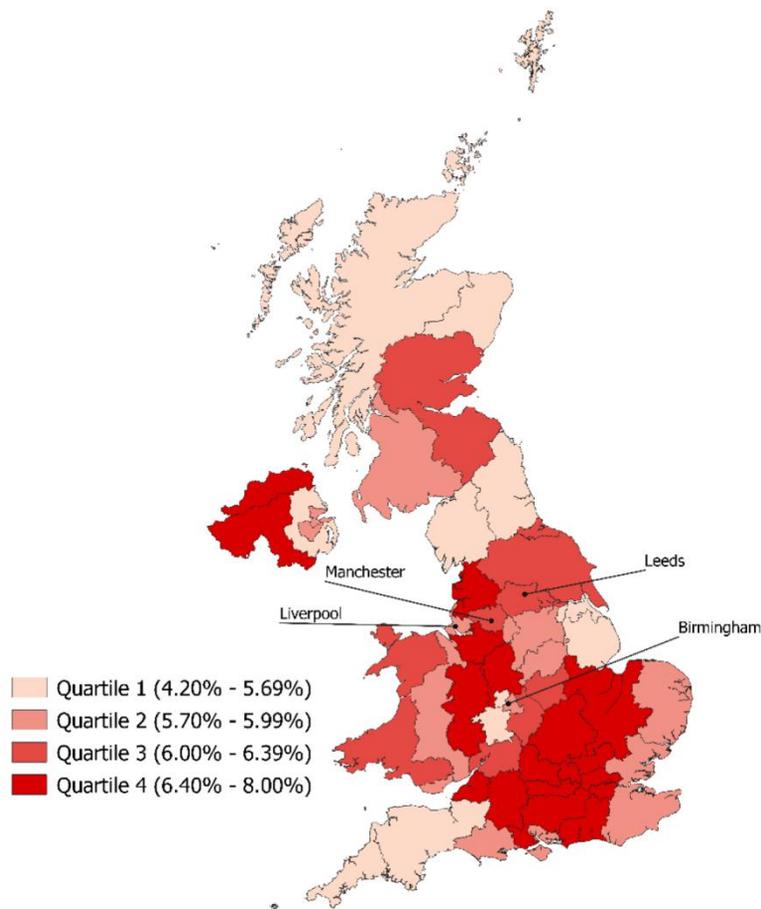
Source: ONS Business Structure Database (BSD)

Within England there is a much more complex pattern across the LEPs. Outside London, which records the highest proportion (9.4%), the broad pattern is that of LEPs along the M4 corridor and a spine from London through the Midlands to Manchester having above average proportions of these scaling firms.

2.3 High-Growth Firms

The number of high-growth firms (HGFs), as defined by the OECD ³⁴, in the UK declined very slightly in the 2014-17 period – the absolute number fell from 11,855 (2012/15) to 10,718 (2014/17) which means that the overall incidence rate is now 6.3% for the UK compared to 7.5% in the previous period. The incidence rate of high-growth firms in England varies from 4.4% in the Black Country to 8.0% in London (Figure 4). The spatial pattern within this range is shows that, apart from the border areas of Northern Ireland which record above average incidence rates, there is a clear concentration around the arc from Cambridge to Bristol and the LEPS along the M4 and M3 corridors. This represents a retrenchment to the south compared to previous years.

Figure 4: High-Growth Firm Incidence Rate (20% threshold) in England (2014-17): Quartiles

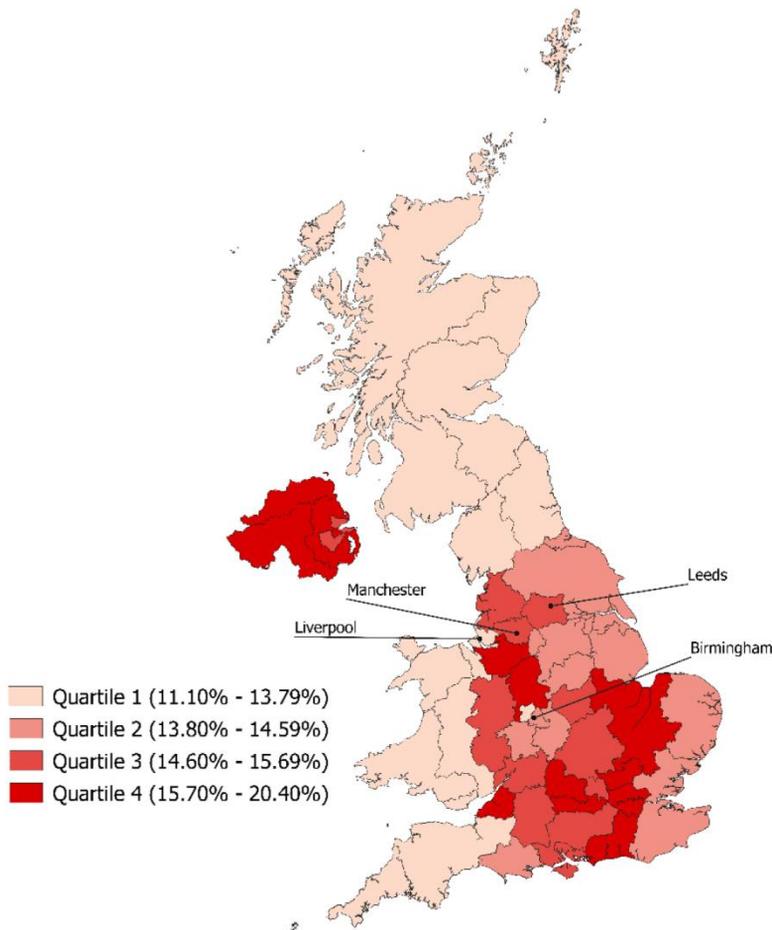


Source: ONS Business Structure Database (BSD)

In recent years the OECD have decided to relax their 20% threshold for the definition of a HGF to 10% for both measures (i.e., using employment or revenue). Figure 5 shows this definition for the first time and the picture is a stark one. Again Northern Ireland stands apart from Wales and Scotland with all sub-regions having a proportion above the UK average of 15% with North of NI (20.4%) and the West and South region of NI (18.1%) having the highest rates in the UK. In England the pattern is not dissimilar to that for the more constrained growth rate of 20% with LEP areas in the south having higher incidence rates. The pattern can be portrayed by a southern ‘triangle’ connecting Cambridge, Bristol and Brighton. Herefordshire (18%) and the West of England (17.8%) have the highest rates just ahead of London (17.2%).

³⁴ High-Growth is defined as annualised average growth in employment of 20% or more over a three year period (2012-15) and restricted to a business having at least 10 employees in 2014.

Figure 5: High-Growth Firm Incidence Rate (10% threshold) in England (2014-17): Quartiles



Source: ONS Business Structure Database (BSD)

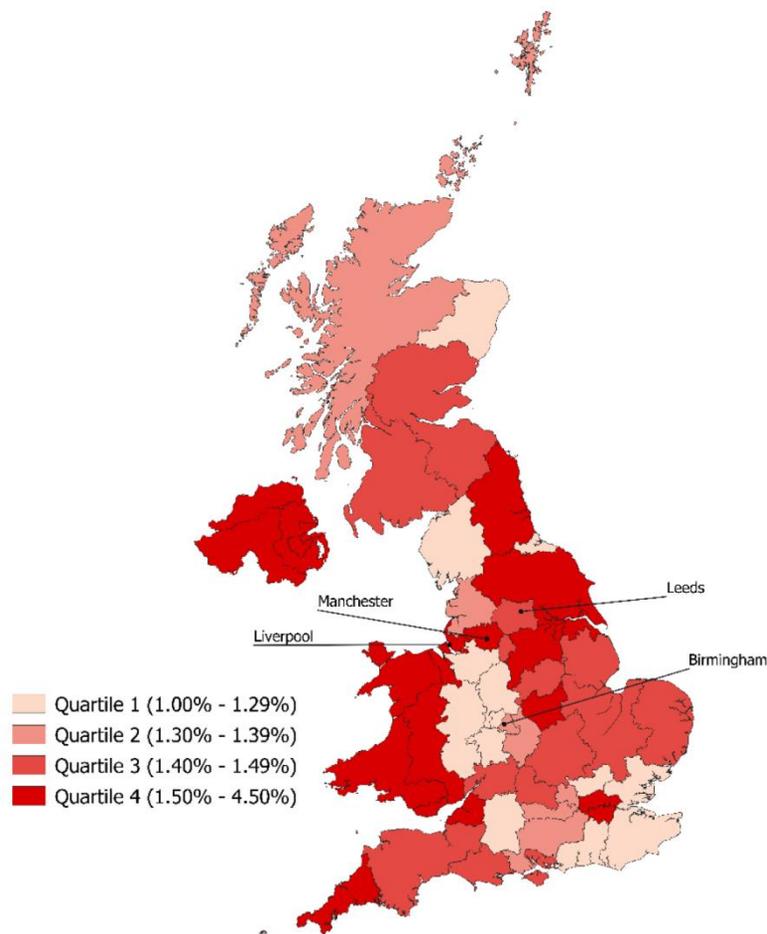
2.4 Small High-Growth Firms

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).

Overall, the UK SHGF incidence rate is 1.5% for the 2014-17 period which is lower than in previous periods: 2.0% in 2012-15 and 2.4% in 2011-14. As with the HGF measure the SHGF measure exhibits a complex geography and in general, stands in contrast to that for the HGF measure (Figure 6). The only common feature is that London dominates on both measures. However, there is very little variation across England with the incidence rates ranging from 1.7% in London to 1.1% in Hertfordshire.

Beyond the capital, however, it is the more peripheral parts of England together with the northern powerhouse cities of Liverpool and Manchester that record above average shares of SHGFs. The three home nations perform well on this metric with Northern Ireland recoding the highest rate of 3.2%. The highest rates in the UK are in Northern Ireland sub-regions with the highest being in Belfast (4.5%) while, as we observed last year, the Humber and the North East LEPs also have above average incidence rates of SHGFs. LEPs in the West Midlands are clearly not performing well on this growth metric as indeed are the HGF 'hotspots' in the south we saw earlier.

Figure 6: Small High-growth Firm Incidence Rate in England (2014-17): Quartiles



Source: ONS Business Structure Database (BSD)

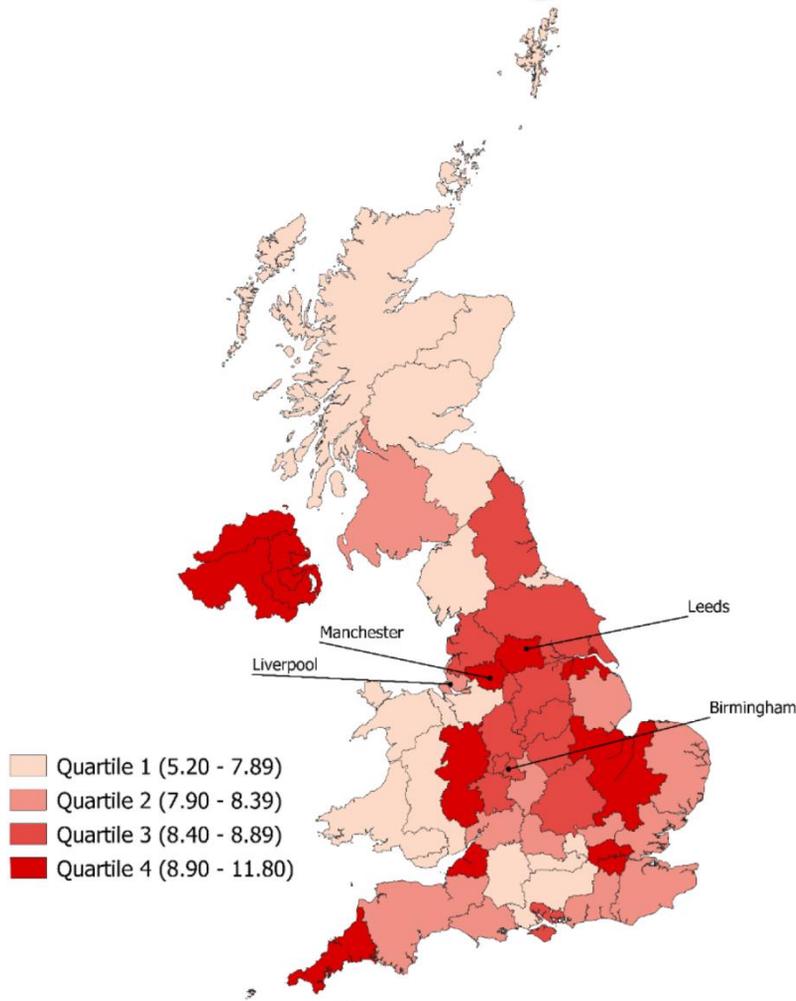
The introduction of this new variation on the official OECD HGF measure is an important innovation and provides a more comprehensive overview of growth in local businesses. The fact that it provides a rather different geography across the English LEPs underlines the importance of resisting the acceptance of a single metric for ‘high-growth’ firms and this metric serves to capture the growth in the micro-business sector where, as we have seen from the ERC’s new ‘Micro-Business Britain’ survey, there is not only growth but significant levels of ambition and innovative business practices.

2.5 Productivity Growth

We devised this growth metric for two reasons. First, as a result of our previous research which 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 2008-2015³⁵. Second, the current ‘Long Tail Productivity Review’ 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.

³⁵ British Business Bank (2018) “Small Business Finance Markets Report”, February 2018. <https://www.britishbusiness-bank.co.uk/research/small-business-finance-markets-report-2018/>

Figure 7: Proportion of firms with positive productivity growth 2014–17 (where turnover and employment both increased but turnover grew at a faster rate)



Source: ONS Business Structure Database (BSD)

The new productivity metric reveals that only 8.4% of all job-creating employer enterprises in the UK achieved positive productivity gains (revenue per employee) while still increasing jobs over the period 2014–17. Perhaps surprisingly, Northern Ireland had the highest proportion in the UK at 11% while the proportion in Wales and Scotland was 7.4% for both home nations which was below the average of 8.5% for England (Figure 7).

Across the English LEPs the pattern is complex with the West of England, the North (Leeds City Region and Greater Manchester) and London having the highest proportions of firms with productivity growth measured in this way. Only Greater Cambridgeshire and Greater Peterborough LEP in the ‘south’ had above average proportions of firms with productivity growth. Indeed, many of the LEPs in the south of England (Bucks; Swindon and Wiltshire; Thames Valley Berkshire and Enterprise M3 had below average proportion of these firms.

3 Conclusion

This overview of a range of business growth metrics has underlined the fact that, irrespective of the measure adopted, there are very few firms in the UK which can be categorised as ‘high-growth’ or ‘scaling’ and indeed contributing to productivity growth. We also know that this small group of firms, whether start-ups scaling or more established businesses growing rapidly for the first or second time, have had a disproportionate impact on job creation. They are crucial to the growth of the UK economy and the re-balancing of the economy away from London and the South East but the evidence points to little impact on the ‘productivity gap’. The maps show a complex LEP geography of ‘growth’ which challenges some of the preconceptions about the ‘hotspots’ of business growth across England. There is evidence of strong business growth underpinning the development of the Northern Powerhouse but there are some faulty valves in the Midlands Engine which need urgent attention – especially in the West Midlands.

A single-minded preoccupation with HGFs and indeed SHGFs, whatever definition the OECD decide to use, may not be a sensible focus for policy-makers as they seek to address the growth and productivity problems confronting the UK economy. Not only are these measures somewhat artificially defined, they also have the disadvantage of rendering invisible the reality of growth for the majority of businesses which is usually episodic and not constrained by an arbitrary 3-year period.

As we have argued on many previous occasions it would be more informative to concentrate on the importance of creating a growth pipeline at local level and monitoring its development over time. Tracking cohorts of start-ups over time, and other groups of established firms as they begin to engage in a range of activity which prepares them for future growth, would be a more meaningful focus for business support policy and demands richer data.

The ERC research team have turned their attention to the geography of ‘high-growth’ episodes in the life of a business and this will be disseminated later in 2018.



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