The Digital Opportunity for Small Businesses

How improved digital skills and connectivity boost local areas

intuit quickbooks

FOREWORD

Small businesses are the backbone of the UK economy. With 5.9 million small businesses in the UK employing 16.6 million people, they provide nearly half of the UK's total jobs. Entrepreneurship is everywhere and it is powering prosperity.

The small business landscape is vibrant and exciting. That's not to say it is without its challenges – Brexit created uncertainty, productivity has slowed down and consumer confidence is low.

But small businesses are currently positioned at the brink of a huge opportunity, rooted in digital technology.

We believe for small businesses to endure and be successful, they must have digital at their core. Last year, we commissioned The Productivity Payout report, which revealed the digitisation of VAT would act as a catalyst to a £57bn productivity pay-out for UK SMEs over five years[1]. We recently stress tested these results and found Making Tax Digital has already resulted in £815 million[2] in productivity benefits for small businesses.

The connection between digital and productivity is undeniable. But this year, we wanted to build on this theme and uncover in-depth regional insights on how small businesses use digital tools and their levels of connectivity.

Today, I'm delighted to introduce The Digital Opportunity for Small Businesses. For the first time, we have partnered with Oxford Economics to explore the impact of digital behaviours and technologies on small businesses and the wider UK economy.

Oxford Economics examined two key factors – the digital infrastructure available to small businesses, and their use of digital tools.

The research found that digital infrastructure isn't evenly distributed, and rural areas suffer most from poor connectivity. However, the opportunity is huge – balancing access to digital infrastructure, with technology developments such as 5G, could boost UK GDP by £5.4 billion. We must continue to push for equal rollout of the likes of 5G to help small business connectivity across the UK.

The study also found that even in locations with good digital infrastructure, businesses lack the inclination to use digital capabilities and, as a result, are not reaching their full potential. There are as many as 97 regions with above average infrastructure, meaning small businesses in these regions could embrace digital tools now. The research shows that if small businesses improve their digital skills, it could boost UK GDP by £9.9 billion.

These findings are staggering and underline why we're so passionate about small businesses making the most of the digital tools available. By doing so, they can be more productive and – most importantly – ensure they are best equipped to make their business a success.

I am regularly speaking to small business owners across the country. I understand the challenges they can face on a daily basis, just to keep on an even keel. With right digital tools and support in place, you can run and grow your business with confidence.

Together, we can embrace this untapped digital opportunity.

We hope you enjoy the report.

Chris Evans, Vice President and UK Country Director, Intuit QuickBooks

1 Intuit QuickBooks and Volterra Partners, *The Productivity Payout*, February 2019
2 Intuit QuickBooks research, October 2019


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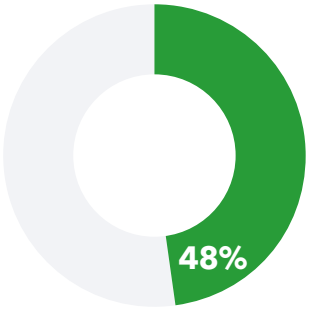
THE SMB DIGITAL OPPORTUNITY

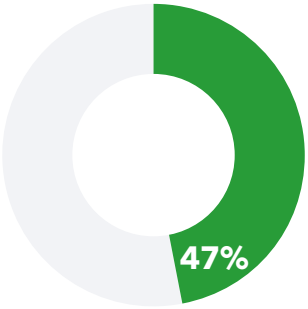
UK SMALL BUSINESS PROFILE

16.6 million workers



47.9% of UK's total employment

£2,168 billion annual turnover



47.3% of UK's total turnover

DIGITAL USAGE

Only **46.7%** of SMBs have a website

6.9% of their turnover comes from web sales or EDI*

8.6% use customer management software

THE SMB DIGITAL OPPORTUNITY

SMBs' existing contribution to GDP:

£782 bn

* Electronic Data Interchange

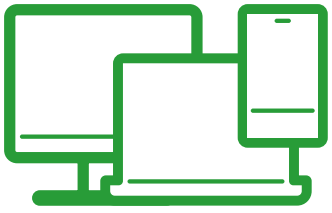
Improved connectivity:

+£5.4 bn

Boost to UK GDP via SMBs if below-average NUTS3 areas were raised to national average.

Enhanced digital usage:

+£9.9 bn

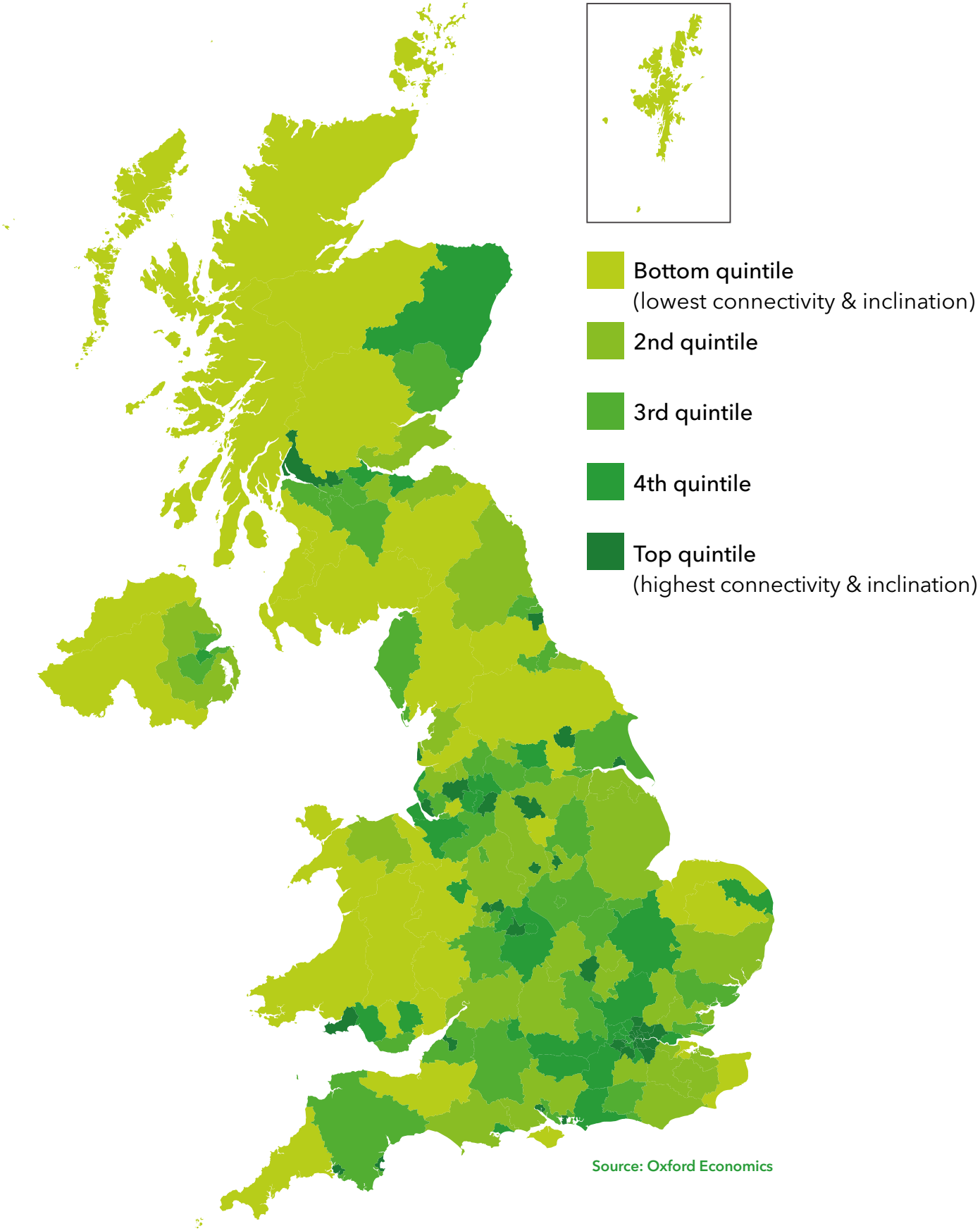


Boost to UK GDP if SMB workers' digital skills in below-average areas were raised to industry averages.

Total potential boost to GDP:

+£15.3 bn

THE SMB DIGITAL PROPENSITY INDEX



Source: Oxford Economics

EXECUTIVE SUMMARY

Small and medium-sized businesses (SMBs) are the backbone of the UK economy.[1] Entrepreneurship is everywhere and is crucial for the UK's growth. Accounting for 99% of businesses in the UK, and employing 16.6 million people in 2019, SMBs provide nearly half (48%) of the UK's total jobs, increasing to over 60% of private sector jobs. In 2018, SMBs sold £2,168 billion worth of goods and services, accounting for 47.3% of the UK's total turnover, and contributed an estimated £782 billion to the national GDP that year.

An untapped opportunity for UK SMBs

The uptake of digital technology among UK SMBs lags behind large UK firms or their SMB counterparts in Europe. Findings from the Office for National Statistics (ONS) show that only 6.9% of UK SMBs' turnover comes from web-based sales, compared with more than 25% for large UK firms. Moreover, only 46.7% of SMBs have a website to support their business, compared to 95.6% of large firms[2].

16.6 mn

Total number of people who worked within UK SMBs at the beginning of 2019—more than 60% of all jobs in the private sector.

UK SMBs are less likely to adopt the digital tools that could help manage their businesses more effectivity. In 2018, only 8.6% of SMBs used customer management software to collect, store, and share information about their customers, while just 4.5% used it to analyse information about customers for marketing purposes. This compares with 62.9% and 47.6% respectively for large firms, according to the ONS survey.

At a micro level, the shortage of skills has contibuted this divide. At a macro level, digital infrastructure is hindering uptake. However, there is an untapped digital opportunity for SMBs. Embracing new innovation and technology will enable SMBs to boost productivity and drive competitiveness. For the UK economy, this means the opportunity to increase GDP and raise the standard of living.

1 SMBs are defined as all businesses operating in the private sector with between 0 and 249 employees.
2 The Office for National Statistics' (ONS) e-commerce and information and communication technologies (ICT) activity survey, 2018

Grasping the digital opportunity

Oxford Economics has created the *SMB Digital Propensity Index* to understand the digital opportunity. This first-of-its-kind Index highlights how digital infrastructure and SMBs' inclination and ability to use digital tools vary across the UK's 173 NUTS3 regions, and also its industrial sectors.

The research found that **upskilling SMB staff in regions where uptake of digital tools in the workplace is below average and bringing them up to the national average could boost UK GDP by £9.9 billion or 0.5%.**

SMBs provide a greater share of employment in areas with poor digital connectivity. **Improving digital connectivity could lead to a SMB productivity boost worth £5.4 billion, or 0.3% of GDP.**

These two potential 'digital dividends' amount to a total £15.3 billion boost to UK GDP.

£15.3 bn

Potential increase in UK GDP in 2018, if SMBs had greater connectivity and inclination to use digital tools.

In the future, the productivity lift from improving access and uptake of digital tools may go further. As UK's connectivity levels improve and digital technology evolves, such as through the rapid roll out of 5G, the gains for UK SMBs, and the UK economy, may be even greater.

1 INTRODUCTION

This study assesses the potential impact on the UK economy of improved use of digital tools by small and medium-sized businesses (SMBs). Commissioned by Intuit QuickBooks, it has been carried out by Oxford Economics amid a growing awareness of the importance of digital activity to the UK economy and society as a whole.

The Government's UK Digital Strategy, published in 2017, established that:[3]

- "connectivity drives productivity and innovation";
- "no part of the country or group in society should be without adequate connectivity"; and
- "we need to help all businesses become as productive and competitive as those who are in the vanguard. Adopting digital technologies will be crucial to this."

The first part of this report assesses the role of SMBs in the wider UK economy, and in the different industries and localities making up the economy. We go on to examine the extent to which the use of digital tools by SMBs falls short of the average across the business sector as a whole, the reasons underlying this shortfall, and the potential benefits to SMBs, local areas, and the national economy, of improving these regional disparities.

1.1 The importance of SMBs to the UK economy

For the purposes of this report, SMBs comprise all businesses with fewer than 250 employees. This includes the large number of UK firms run solely by their owners and partners ("working proprietors"), the "zero employee" category in the relevant UK dataset, as well as those with 1-249 employees.

5.9 mn

SMBs operating in the private sector at the start of 2019, this is 99.9% of all businesses in operation in the private sector.

At the UK-wide level, the importance of SMBs is clear and well known. In 2019, private sector SMBs accounted for 99.9% of all businesses in that sector, and for 52.2% of sector turnover.[4] These firms provided 16.6 million jobs (for employees plus working proprietors)—equivalent to 60.5% of total private sector employment, and 47.9% of jobs across the entire UK economy.[5]

The importance of SMBs does, however, vary quite significantly between different parts of the UK economy, both by sector of industry and geographical location. Chapter 2 looks at the SMBs' contribution at this more detailed level.

3 Department for Digital, Culture, Media & Sport, (2017), 'UK Digital Strategy', March.
4 Department of Business, Energy and Innovation Strategy, (2019), 'Business population estimates for the UK and region 2019', 10 October. The "private sector" here covers all organisations essentially operating on a commercial basis, including public corporations but excluding charitable bodies.
5 The whole economy also includes all central and local government bodies, and charitable organisations. If government and charitable bodies with fewer than 250 employees are also included in the definition, then SMBs accounted for 17.8 million jobs, or 51.3% of whole economy employment.

1.2 Why are digital tools underused by UK SMBs?

To assess the extent to which SMBs use digital tools less than their larger counterparts, we analysed detailed results from a range of datasets and surveys, including the annual ONS e-commerce and ICT activity dataset.[6] This analysis, and the reasons behind it, are set out in Chapter 3.

Aspects of digital tool use covered include use of e-commerce channels for sales purposes, the share of turnover derived from these channels, website operation, particular website uses (e.g. online ordering possibilities), employees' use of the internet and smart devices, employees' IT training, employment of specialist IT staff, use of particular types of software, and use of "big data".

At the broadest level, we find that SMBs' underuse of digital tools can be broken down into three key factors:

1. The distribution of SMBs between geographical locations that are well connected to the UK's digital infrastructure, and areas with poor connectivity where businesses (regardless of size) are unable to use digital tools they would otherwise choose to access.
2. The distribution of SMBs between hi-tech industries, where the use of digital tools is very advantageous or even essential, and other sectors, where digital tools are not so important.
3. The extent to which SMBs use digital tools less than their larger counterparts *within the same industry and location type* (with the latter determined by a location's level of digital connectivity).

6 ONS, (2019), 'E-commerce and ICT activity, 2018', 29 November.

1.3 The economic impact of improving SMBs' digital propensity

As part of our analysis, we have constructed the "SMB Digital Propensity Index", explained in detail in Chapter 4. This enables us to rank each of the UK's 173 local (NUTS3) areas based on a range of factors gathered under two broad categories, as follows:[7]

- SMBs' digital connectivity, reflecting the digital infrastructure available because of their geographical location; and
- SMBs' "digital inclination", reflecting the tendency of small businesses in each area to use the digital tools that are already available to them, to the extent that this cannot be explained by their sector of industry.

It is widely accepted that an increased use of digital tools is associated with an increase in GDP contribution per job. We then use the Index to undertake two "thought experiments" exploring the potential economic impact for the UK as a whole if below-average areas for connectivity infrastructure and SMBs' digital skills could be raised to, respectively, national and industry average levels.

Chapter 5 explores SMBs' current use of advanced technologies such as Artificial Intelligence (AI) and Augmented Reality (AR), and argues that the scale of the opportunity digital offers SMBs will only increase in the future. It is followed by a summary of the key conclusions of this study in Chapter 6.

7 Nomenclature of Territorial Units for Statistics (NUTS) areas are geographical regions for which statistics are collected. In England, they are counties or groups of unitary authorities. In Scotland, they are combinations of council areas, local enterprise companies and parts thereof. In Wales, they are groups of unitary authorities. In Northern Ireland, they are groups of district council areas.

2 THE IMPORTANCE OF SMBS TO THE UK ECONOMY

Speaking at the QuickBooks London HQ in March 2019, Kelly Tolhurst, the then Small Business Minister, said: *"micro and small businesses really are the lifeblood of this country. They contribute so much to the communities in which they operate."*[8] But their impact is not felt evenly across the UK, nor is it the same across each industry. In this chapter we initially summarise the total contribution to the UK economy, but then investigate how their impact varies across local regions and in which industries they are most prevalent.

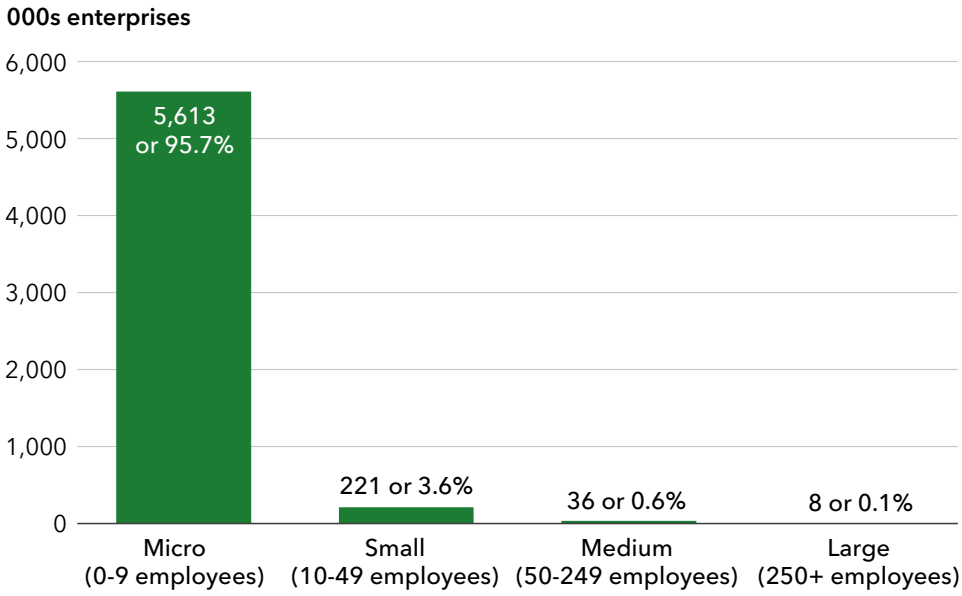
For our analysis, SMBs are defined as private sector (including public corporations and nationalised bodies), government, and non-profit organisations with fewer than 250 employees.

2.1 SMBs' contribution at the national level

According to latest Department of Business, Energy and Innovation Strategy (BEIS) business population estimates, there were 5.9 million businesses operating in the private sector in the UK at the start of 2019.[9] Micro firms which employ less than 10 people were the dominant size of enterprise, comprising 95.7% of all businesses (see Fig. 1), while small firms (10 to 49 employees) ranked second with a 3.6% share of the number of firms.

Private sector SMBs employ 16.6 million people in the UK, equivalent to 47.9% of total employment. If we ignore employment at charities and in the public sector, SMBs' share rises to 60.5% of all jobs.

Fig. 1: Number of businesses operating in the private sector at the start of 2019, by employment size category

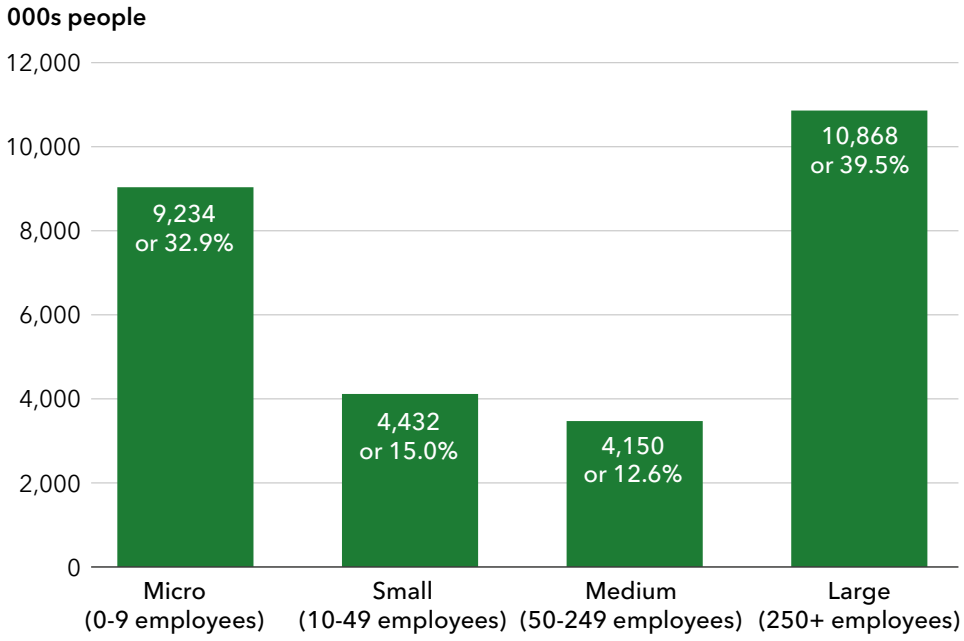


Source: BEIS (2019)

8 https://www.youtube.com/watch?v=gz1ffKbEV8o&t=1s
9 Department of Business, Energy and Innovation Strategy, (2019), 'Business population estimates for the UK and region 2019', 10 October.

Employment within SMBs is concentrated in micro-sized firms. At the start of 2019, they employed over 9 million people, and therefore account for 32.9% of all jobs in the UK. Both small- and medium-sized SMBs employ more than 4 million people, and account for 15.0% and 12.6% of all employment, respectively (Fig. 2).

Fig. 2: Employment at private sector businesses in the UK at the start of 2019, by employment size category



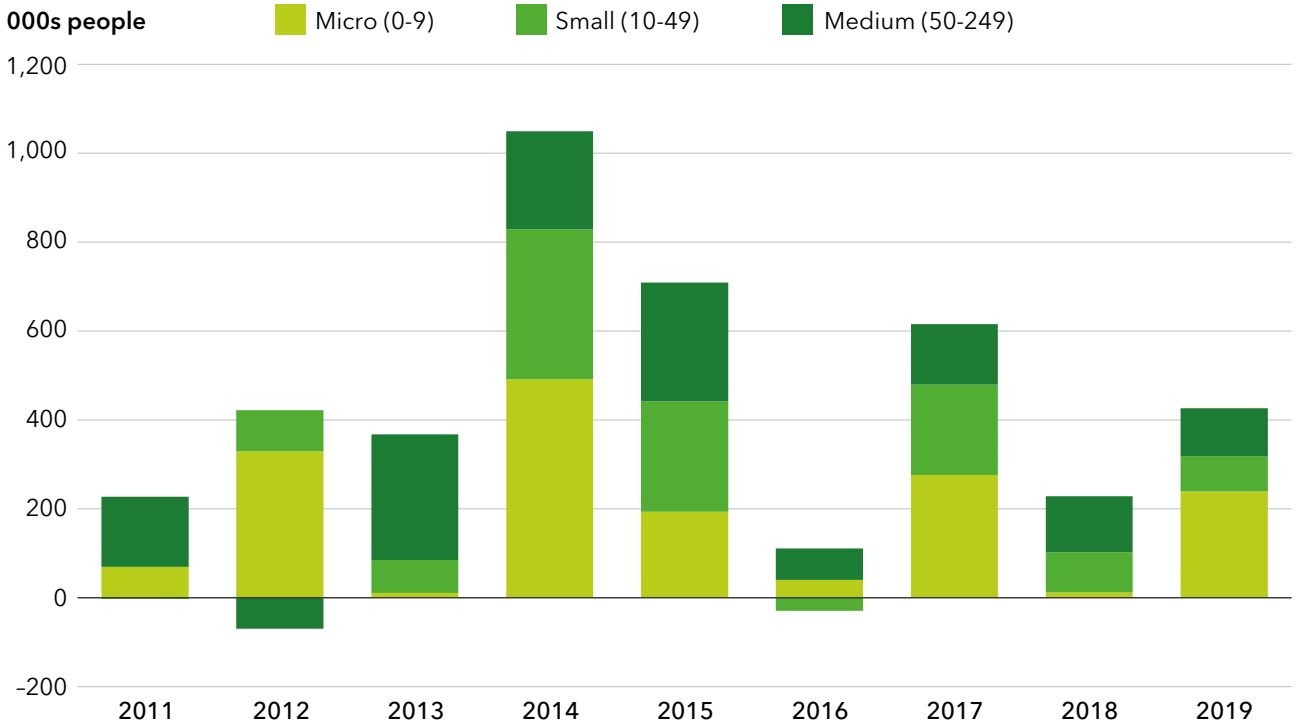
Source: BEIS (2019)

SMBs operating in the private sector have provided much of the impetus to job growth over the last decade. Between 2010 and 2019, employment at private sector SMBs rose by 3.0 million. This compares to a growth of 1.2 million at large (over 250 employees) private sector firms. This has more than offset the 389,000 contraction in public sector employment. Micro SMBs have provided 56.2% of the growth in employment in private sector SMBs (Fig. 3).

3 mn

more jobs at SMBs at the start of 2019 than in 2010.

Fig. 3: Annual change in employment at SMBs operating in the private sector (2011-2019)



Source: BEIS (2019), Oxford Economics

SMBs operating in the private sector are estimated to have received £2,168 billion in revenue in 2018. This equates to 52.2% of all sales by private businesses. SMBs are estimated to have generated a £782 billion gross value added contribution to GDP in 2018. To give an impression of scale, this is 4.6 times the contribution to GDP made by the manufacturing sector.[10] Alternatively, it is 7.6 times the gross value added contribution to GDP made by the construction industry.

Split by size, it is the micros (0-9 employees) which make the biggest contribution to national income. In 2018, they contributed £356 billion or 45.5% of private sector SMBs' total. The contributions made by small and medium sized firms were of a similar size, at £210 billion and £217 billion, respectively.

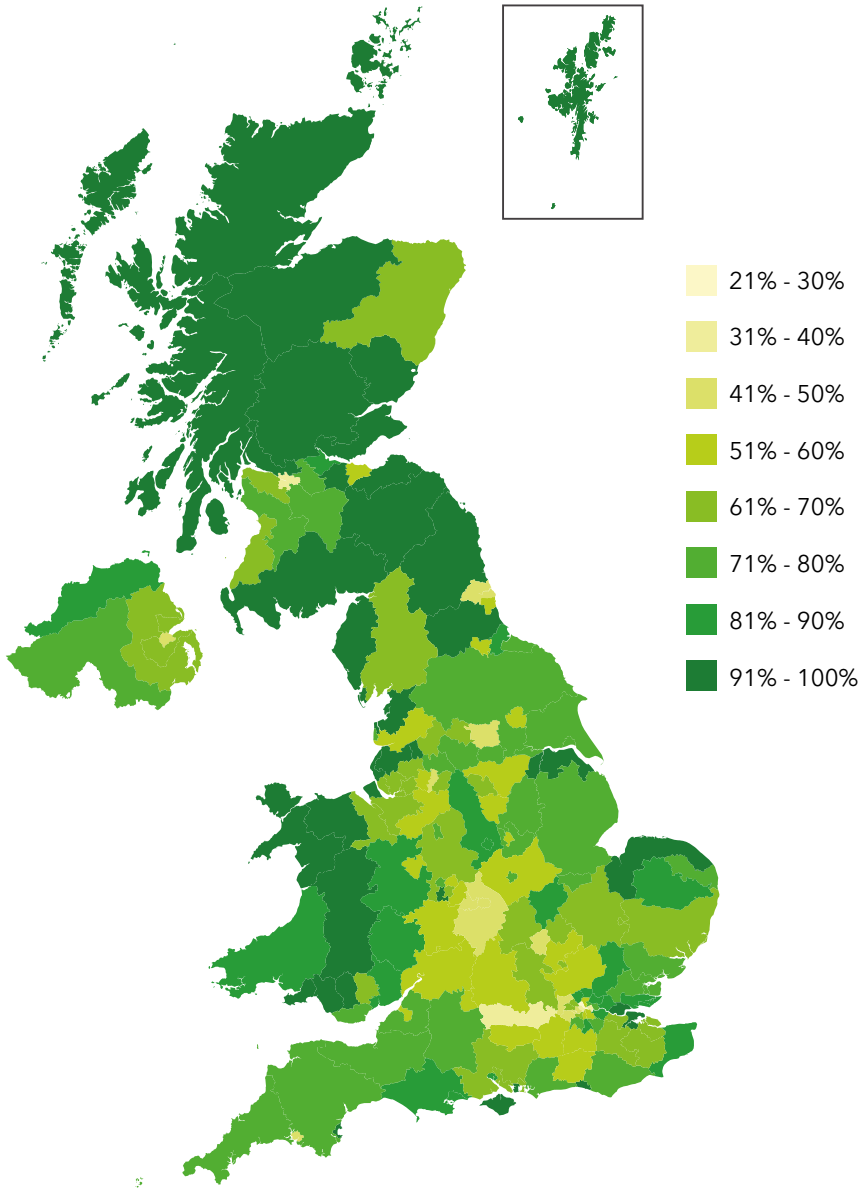
10 ONS, (2019), 'Annual Business Survey - 2018 Provisional Results', 7 November.

2.2 SMBs' contribution at the local level

SMBs importance as providers of employment and the generators of GDP varies considerably across different localities. In this section, we investigate in which communities SMBs make the largest contribution to jobs and make the largest contribution to local GDP. We undertake the analysis for each of the 173 NUTS3 regions.

To estimate the employment at SMBs, we have multiplied the number of enterprises in the different employment size categories in each NUTS3 region and industry by the average number of employees in firms in the same size category and industry.[11] This total employment at SMBs in each of the 173 regions is expressed as a share of total employment. The results across the whole UK are shown in Fig. 4.

Fig. 4: SMBs' share of total employment by NUTS3 region



Source: Oxford Economics

11 Using Department of Business, Energy and Innovation Strategy, (2019), 'Business population estimates for the UK and region 2019', 10 October.

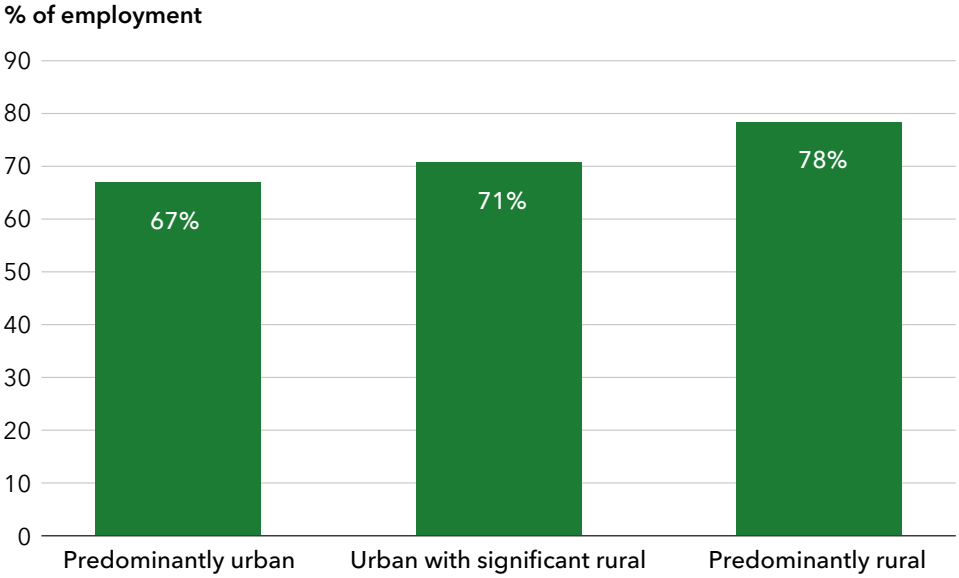
The importance of SMBs to local labour markets varies markedly across the UK. The share of employment they provide varies from a low of 29.9% in Camden and the City of London to 100% in three of the 173 NUTS3 regions. This compares to a UK average of 60.5%. The map reveals SMBs account for over 90% of jobs across large areas of rural Scotland and in the central belt of Wales. By contrast, less than 50% of jobs are accounted for by SMBs in parts of the South East, central London, and in major cities across the UK, including Glasgow, Belfast and Manchester.

78%

of jobs in predominantly rural areas in England are at SMBs.

Some confirmation of the SMBs having a greater importance in rural areas relative to urban ones comes if the NUTS3 regions are sorted using DEFRA's rural-urban classification.[12] This suggests that in predominately rural areas, 78% of all employment is provided by SMBs (Fig. 5). This declines to 67% for predominately urban ones.

Fig. 5: SMBs' share of employment for each NUTS3 region in England by DEFRA's broad rural-urban classification



Source: DEFRA, Oxford Economics

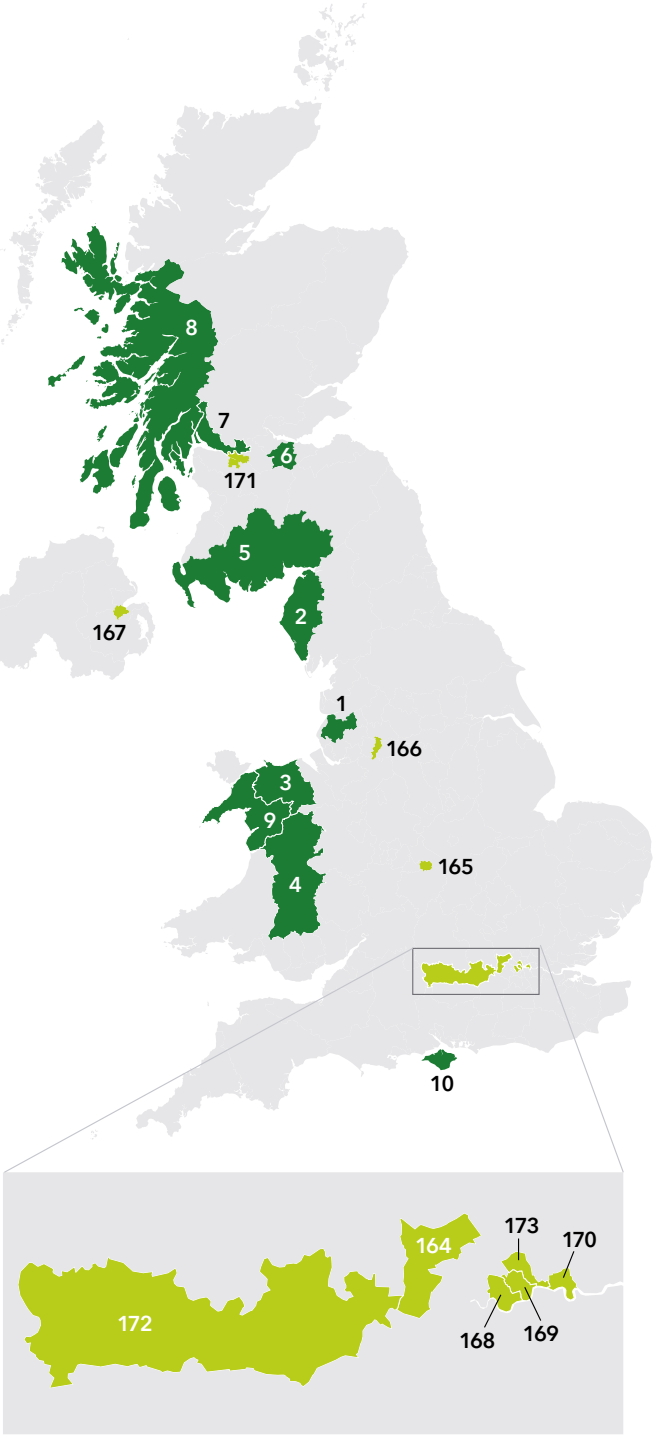
The majority of the "hotspots" for the share of employment provided by SMBs are in rural areas. In three of the 173 NUTS3 regions, SMBs provide all of the employment (see Fig. 6). Of the top-10 SMB employment share hotspots, four are in Scotland (out of the 23 NUTS regions in that country), with three each in England (out of 133 NUTS regions), and Wales (out of 12). Surprisingly, none of the top 20 are in Northern Ireland, which possesses the highest share of employment at SMBs across all four countries at 78.4%, compared with 75.3% in Wales, 65.1% in Scotland, and 59.2% in England.

12 Government Statistical Service, (2015), 'The 2011 Rural-Urban Classification for Output Areas in England', May.

In contrast, the NUTS3 regions where SMBs provide the lowest share of employment are predominantly within cities. Five of the lowest 10 NUTS3 regions for SMBs share of employment are within London, while two of the others are located within Manchester and Glasgow.

SMBs' importance as providers of employment does not appear to be related to an area's affluence. There is no apparent relationship between the share of employment at SMBs and the English Indices of Deprivation.[13]

Fig. 6: The 10 NUTS3 regions that are most, and least, dependent on SMBs for employment



Rank out of 173	Top 10 NUTS3 regions	Share of employment provided by SMBs
1	Chorley and West Lancashire	100.0%
2	West Cumbria	100.0%
3	Conwy and Denbighshire	100.0%
4	Powys	99.9%
5	Dumfries & Galloway	99.9%
6	West Lothian	99.9%
7	E&W Dunbartonshire and Helensburgh & Lomond	99.9%
8	Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute	99.9%
9	Gwynedd	99.9%
10	Isle of Wight	99.9%

Rank out of 173	Bottom 10 NUTS3 regions	Share of employment provided by SMBs
164	Harrow and Hillingdon	44.2%
165	Coventry	43.3%
166	Manchester	42.7%
167	Belfast	42.4%
168	Kensington & Chelsea and Hammersmith & Fulham	41.1%
169	Westminster	36.9%
170	Tower Hamlets	35.9%
171	Glasgow City	34.1%
172	Berkshire	31.9%
173	Camden and City of London	29.9%

Source: Oxford Economics

13 Ministry of Housing, Communities & Local Government, (2019), 'English indices of deprivation 2019', 26 September.

2.3 SMBs' importance to different industries

At the start of 2019, some 16.6 million people were employed at SMBs operating in the private sector. Of these, some 2.3 million or 14.0% of the total were in the wholesale and retail sector (Fig. 7). The professional, scientific and technical services sector ranked second: its SMBs employed another 2.0 million or 12.3%. The construction sector was third, at 1.9 million or 11.4% of total.

2.3 mn

people were employed at SMBs operating in the wholesale and retail sector at the start of 2019.

The industrial sector in which SMBs provided the highest share of employment in 2019 was "other services". This category includes personal services such as hairdressing and beauty parlours, spas, laundering and dry cleaning, funeral parlours, and the repair of computers and personal house goods. Agriculture, forestry and fishing ranked second at 91.3%, helping to explain SMBs' importance to providing jobs in rural regions. This compared to an average across all industries of 60.5%.

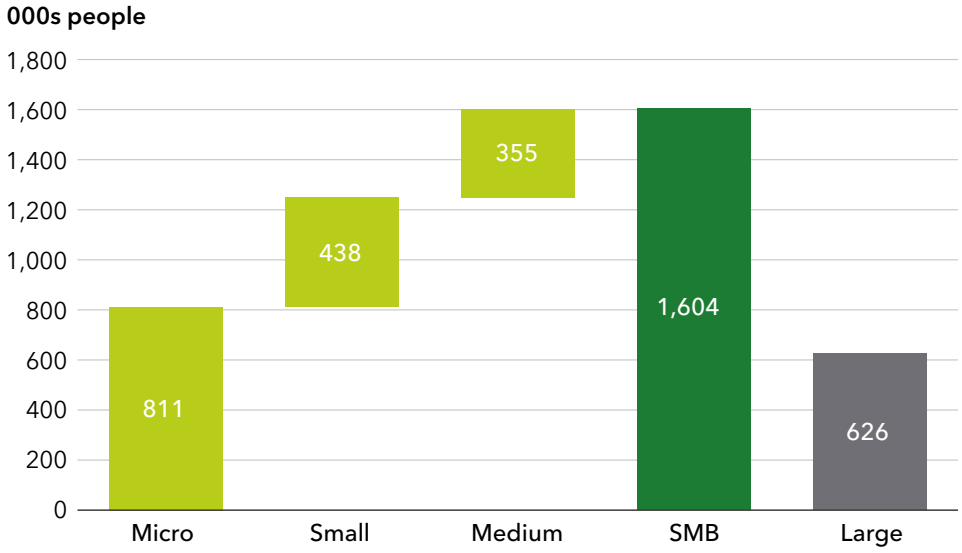
Fig. 7: Employment at SMBs by industrial sector, at the start of 2019

Rank	Industry	People	Share of employment at SMBs	SMBs share of employment in the sector
1	Wholesale and retail	2,327,000	14.0%	45.9%
2	Professional, scientific and technical services	2,049,000	12.3%	75.0%
3	Construction	1,898,000	11.4%	85.6%
4	Manufacturing	1,526,000	9.2%	57.3%
5	Administrative and support services	1,511,000	9.1%	48.8%
6	Accommodation and food services	1,424,000	8.6%	59.6%
7	Human health and social work	1,249,000	7.5%	69.6%
	Information and communication	899,000	5.4%	63.6%
9	Transportation and storage	781,000	4.7%	49.5%
10	Other services (including personal services)	650,000	3.9%	92.3%
11	Arts, entertainment & recreation	534,000	3.2%	67.8%
12	Education	504,000	3.0%	87.7%
13	Agriculture, forestry & fishing	442,000	2.7%	91.3%
14	Real estate	378,000	2.3%	73.4%
15	Financial & insurance	322,000	1.9%	29.8%
16	Extraction; utilities; waste	138,000	0.8%	34.7%
	Total private sector	**16,632,000**	**100.0%**	**60.5%**

Source: BEIS (2019)

Our analysis of the industries in which SMBs are located suggests they are concentrated in some of the fastest-growing sectors. As judged by ONS data on the growth in gross value added between 2013 and 2018, SMBs provide some 72% of the employment (or 1.6 million people) in the top 10 fastest-growing industries (see Fig. 8)[14] This compares to 28% (0.6 million people) for large firms. This is above SMBs' share of all private sector employment at 60.5%. Micros provided some 0.8 million of these staff.

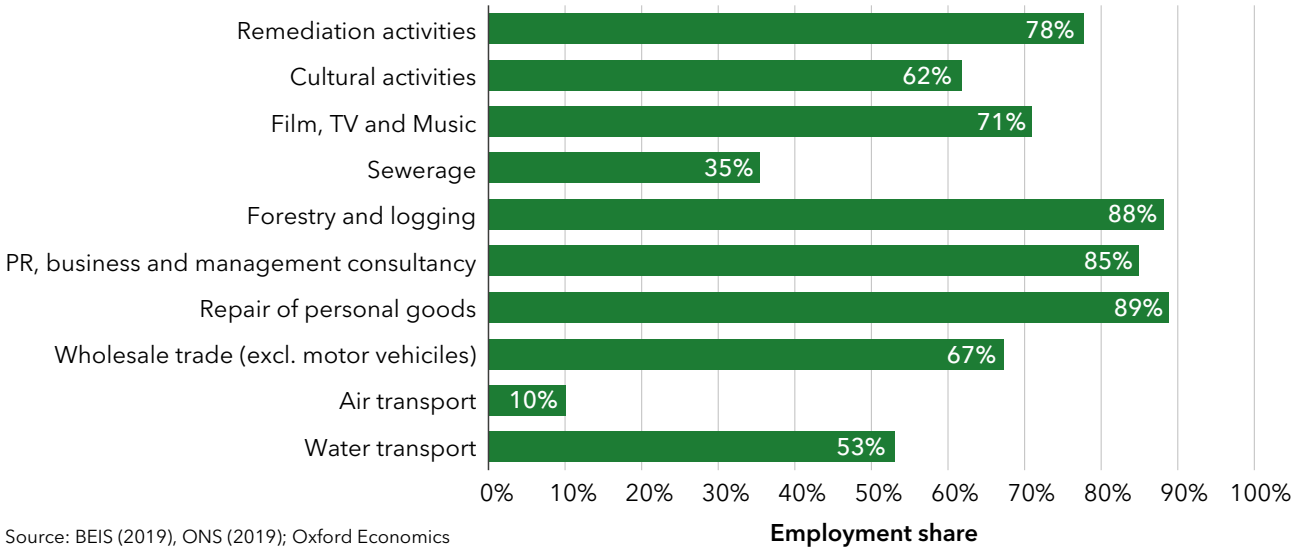
Fig. 8: Employment in the top 10 fastest-growing industries (2013-18)



Source: BEIS (2019), ONS (2019), Oxford Economics

Among the 10 fastest-growing industries over the last five years (2013 to 2018), where SMBs have the highest share of employment are the repair of computers at 89%, forestry and logging at 88%, and PR, business and management consultancy at 85% (Fig. 9). Air transport is the lowest with 10%.

Fig. 9: Employment share of SMBs in top 10 fastest-growing industries (2013-2018)

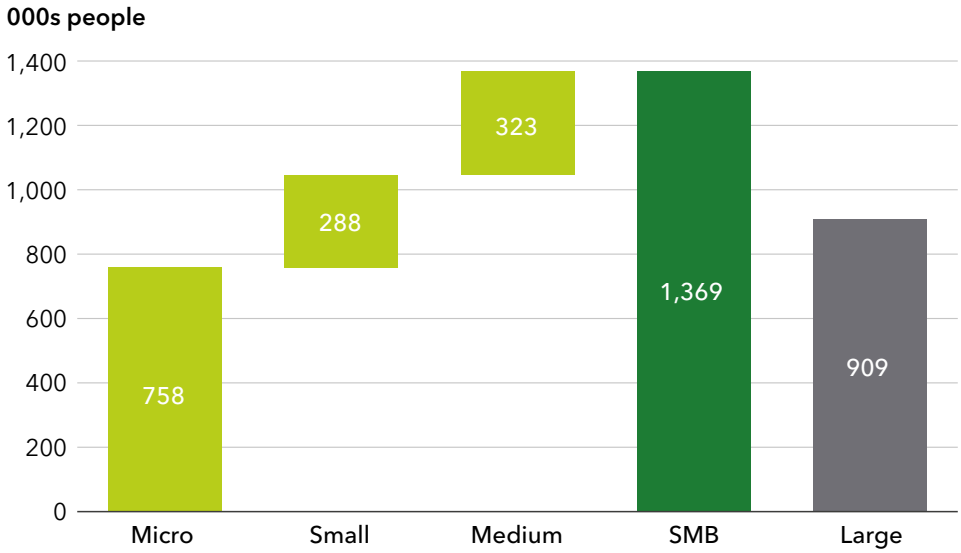


Source: BEIS (2019), ONS (2019); Oxford Economics

14 ONS, (2019), 'Annual Business Survey - 2018 Provisional Results', 7 November. The analysis is undertaken using the two digit Standard Industrial Classification (SIC) definition of each industry.

SMBs are equally well represented among the industries forecast to be among the 10 fastest-growing between 2019 and 2024 as they are the whole private sector.[15] They currently have a 60.1% share of employment in these sectors of 1.4 million jobs, relative to a 39.9% share for large companies (Fig. 10).

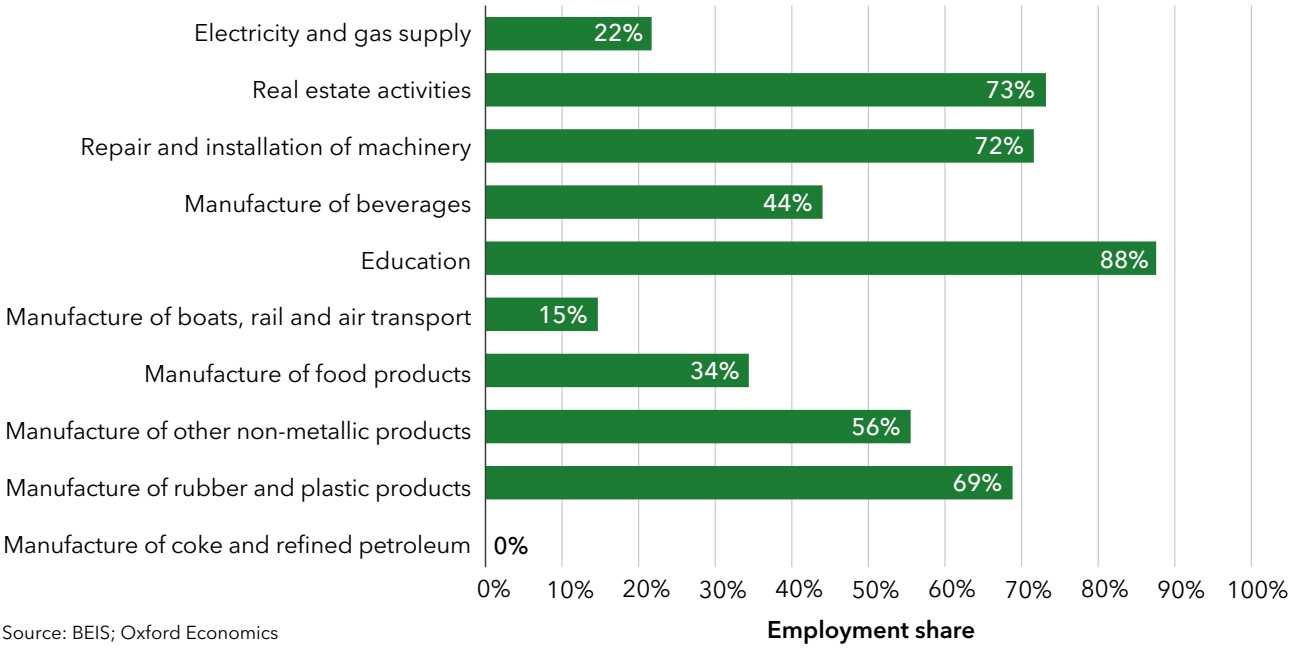
Fig. 10: Employment in the top 10 forecasted fastest-growing industries (2019-24)



Source: BEIS (2019), Oxford Economics

Among the 10 industries forecast to be the fastest-growing between 2019-24, SMBs have the largest share of employment in the private education sector at 88% (Fig. 11). They also have a large share of real estate (73%) and the repair and installation of machinery (72%).

Fig. 11: Employment share of SMBs in top 10 forecasted fastest-growing industries (2019-24)



Source: BEIS; Oxford Economics

15 Forecasts of the industries gross value added are sourced from Oxford Economics' Global Industry Service.

3 WHY ARE DIGITAL TOOLS UNDERUSED BY UK SMBS?

Digitalisation offers opportunities for firms of all sizes to transform their businesses and boost their productivity. Yet SMBs in the UK have in the past been slow to adopt digital technology, relative to both large firms in the UK, and also to SMBs in France and Germany. This chapter explores some of the reasons put forward for this hesitance.

3.1 How digital technology benefits all

Digital technology is ubiquitous across today's business world. From the large corporations to single-person operations, it offers the potential to transform the way businesses operate and how they interact with customers, redesigning business models and strategies. In this section, we explore the benefits that digital technology brings to businesses across the spectrum.

Digital technology raises firms' performance by increasing their efficiency. A major benefit of digital technology is the potential for cost and time savings. Technologies that automate certain tasks can reduce costs, increase accuracy and free up resources for other activities. For example, research commissioned by Intuit Quickbooks from Volterra Partners in 2019 estimates an annual productivity payout of £6.9 billion if SMBs take up the opportunity presented by the Making Tax Digital initiative and adopt a host of new digital processes and behaviours. [16]

One way digital technology enhances SMBs' efficiency is through facilitating economies of scale. Through technologies such as cloud computing, firms can achieve the scale savings without being large themselves. Digital platforms enable the outsourcing of business functions, such as accounting and recruitment, facilitating increased specialisation, and making organisations more efficient and effective.

Employing the appropriate digital technology can increase firms' competitiveness. A firm's competitiveness depends on its ability to innovate and adapt to the changing needs of its market. Digital technology provides businesses with access to new business opportunities and timely market information, increasing customisation and product differentiation, meanwhile decreasing time to markets. Through technologies such as sensors which provide real-time inventory, or integrated business intelligence systems that deliver opportune insights, businesses can increase their competitiveness to capture a larger market share.

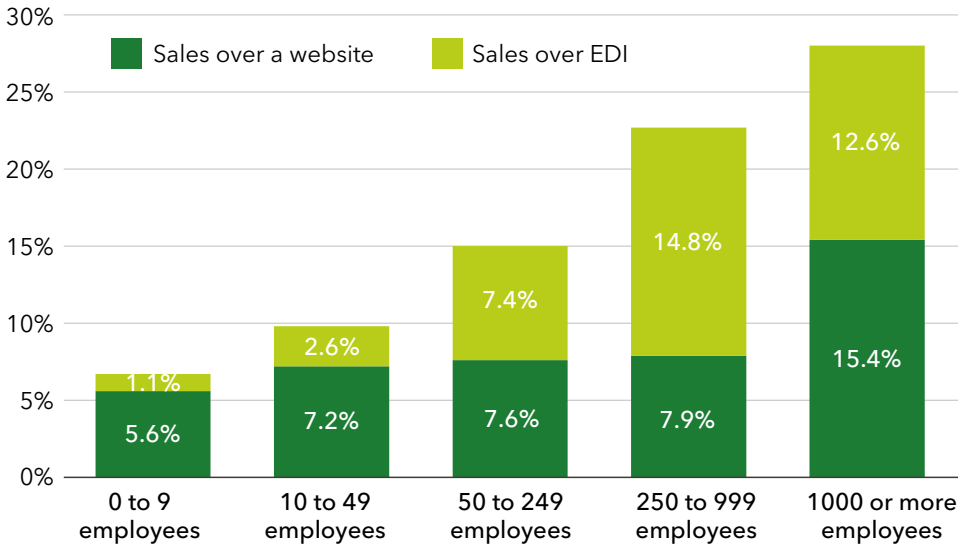
16 Volterra Partners, (2019), 'The Productivity Payout: UK Small Businesses and the Digital Economy'.

Digital technology facilitates business growth and internationalisation. Digitalisation opens new opportunities for businesses to transform their business models, extending their reach beyond local borders. Technology brings new potential for growth across all business sectors, for all types of firms. They have the potential to ease access to markets, strategic resources and networks. This is done through pooling of resources, reducing informational asymmetries that are otherwise costly in the absence of digital technology.

3.2 The current state of digital usage by SMBs

As digital technology becomes more pervasive across the business world, SMBs still lag behind their larger counterparts in their adoption of technology. Survey data collected by the ONS illustrates the gap between smaller and larger businesses in their usage of various digital technologies.[17]

Fig. 12: Proportion of turnover derived from e-commerce sales, by size of business, 2018



Source: ONS (2019)

Businesses with more than 250 employees derived 25.4% of their turnover from e-commerce sales[18] This is well over three times the 6.9% share for all SMBs. For micro firms the share stood at only 6.7%. Similarly, for businesses with between 10-49 employees, less than 10% of their turnover was derived from e-commerce sales.

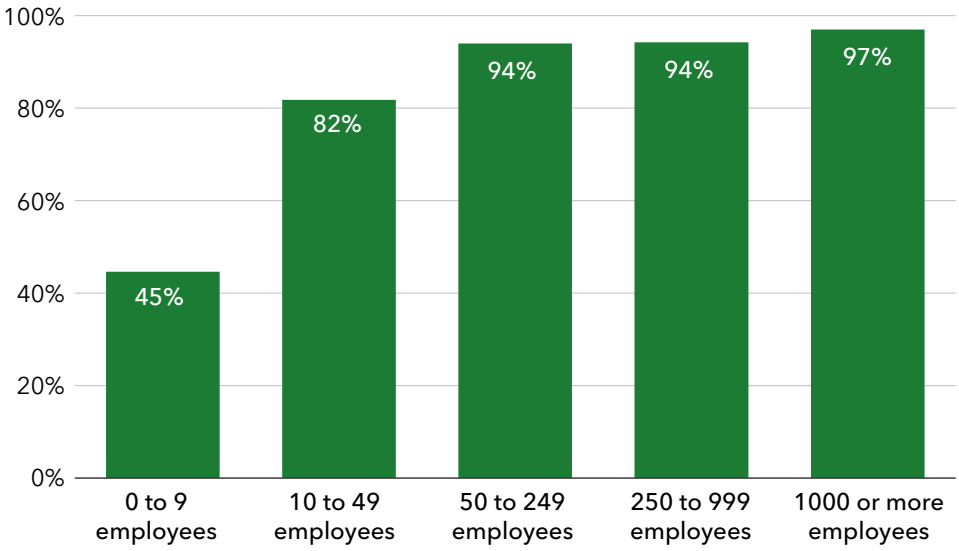
6.9%

of SMBs' turnover came from e-commerce in 2018, compared to 25.4% for large firms.

17 ONS, (2019), 'E-commerce and ICT activity, 2018', 29 November.
18 Over a website and Electronic Data Interchange (EDI)

The smaller share of SMBs' turnover provided by e-commerce in part reflects the share of businesses with a website. Across all SMBs, 46.7% have a website (see Fig. 13), with the share of micros being much smaller than small and medium-sized firms. This compares to 95.6% for large firms.

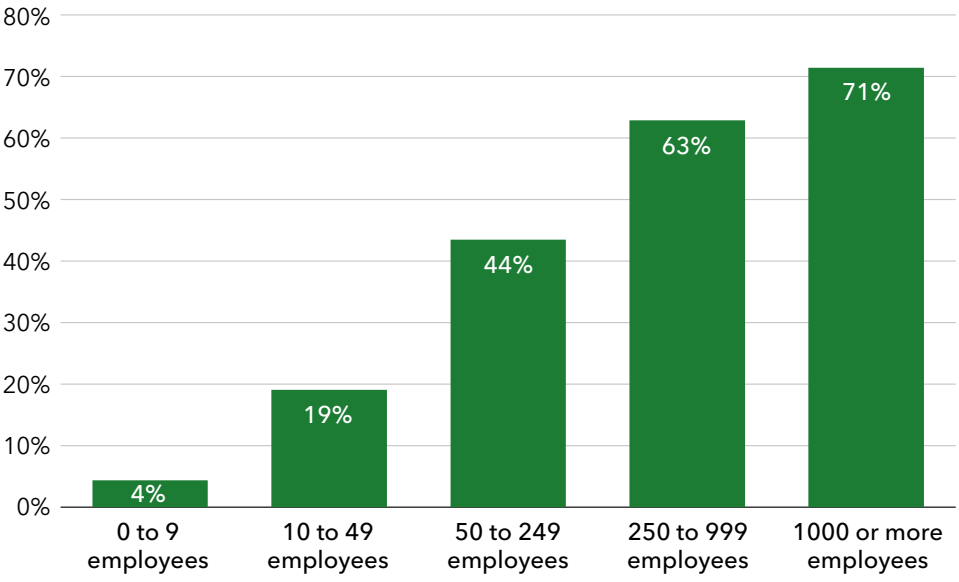
Fig. 13: Proportion of UK businesses with a website in 2018, by size of business



Source: ONS (2019)

Looking at another measure of digital usage, smaller businesses are similarly much less likely to use enterprise resource planning software to help with planning, purchasing, project management, and invoicing. Only 4% of the smallest firms (less than 9 employees) and less than 20% of those in the next smallest group use resource planning software (Fig. 14). In contrast, over 60% of businesses with over 250 employees and nearly two-thirds of the largest firms use resource planning software.

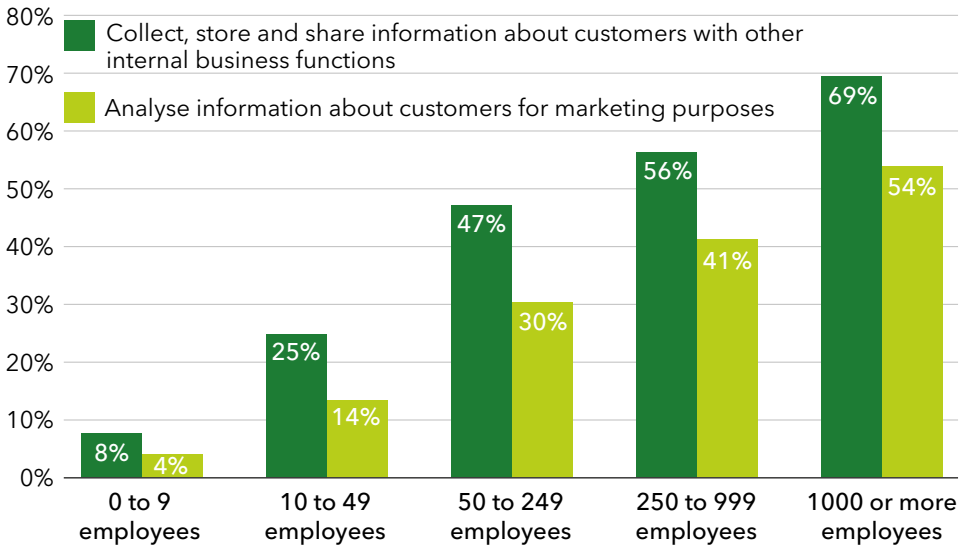
Fig. 14: Proportion of firms using enterprise resource planning software, by size of business, 2018



Source: ONS (2019)

Similarly, they have been slow to adopt some of the digital tools to manage their business' customer relations. In 2018, only 8.6% and 4.5% of SMBs used customer management software to collect, store and share information about customers and analyse information about customers for marketing purposes, respectively (Fig. 15). This compares to 62.9% and 47.6% for large firms.

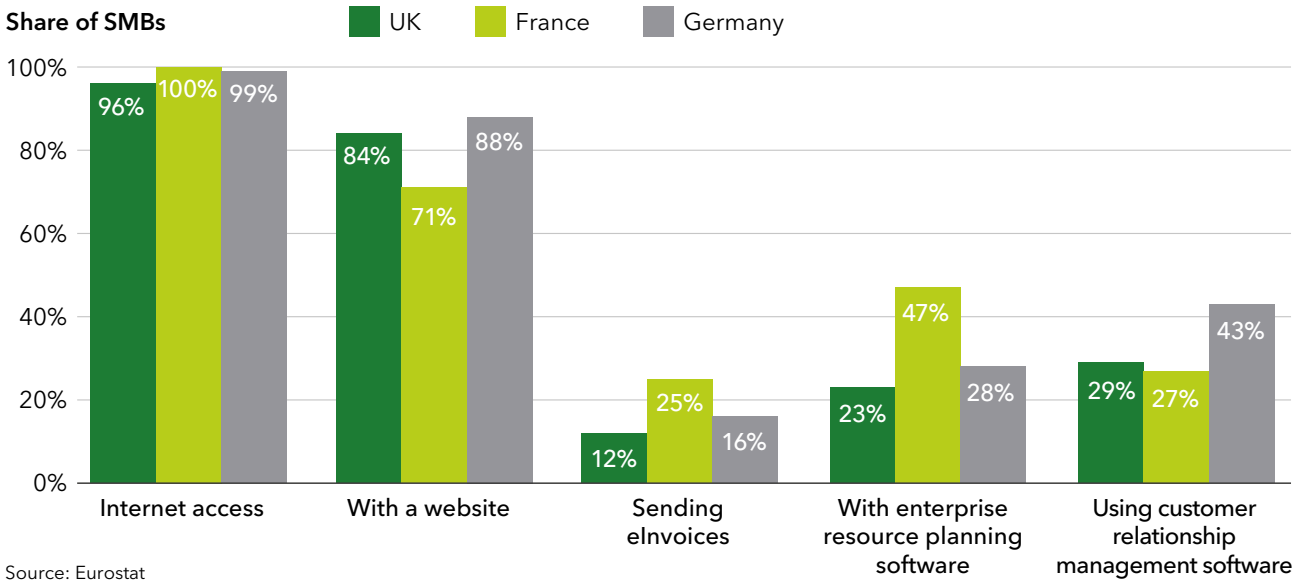
Fig. 15: Proportion of UK businesses using customer relationship management software by size of business, 2018



Source: ONS (2019)

Compared with counterparts in France and Germany, UK SMBs are lagging behind in their level of internet access, use of eInvoices suitable for automated processing, and adoption of both enterprise resource planning and customer relationship management software (Fig. 16).[19] These findings illustrate that a large share of SMBs in the UK have not incorporated important digital processes as a core part of their operations.

Fig. 16: SMBs' adoption of different digital technologies in France, Germany, and the UK, 2019



Source: Eurostat

19 Data relates to enterprises with 10 to 249 employees. The data for the 0 to 9 employee enterprises was unavailable across a number of the indicators. It was downloaded from the Digital economy and society (isoc) folder from the Eurostat data base. https://ec.europa.eu/eurostat/data/database

3.3 Why digital adoption is lower for SMBs

The ONS survey data above illustrate that SMBs in the UK have low digital technology adoption rates relative to larger firms. In this section, we explore the challenges that SMBs face in incorporating the use of digital.

The literature discusses a number of factors that hinder SMBs' adoption of digital technology, which can be broadly categorised into organisational and external factors. Within SMBs, characteristics of company leader, corporate culture, financial capacity and digital skills of employees play a significant role in determining their uptake of digital. Meanwhile, SMBs are still impacted by their country's digital infrastructure, the education system, the availability of skilled external digital experts and the economic environment in which they operate.

Gary Wood, Co-Founder and Director of commercial vehicle company Plumwood:

"As a small business owner, I would say that embracing technology has been key to our success. Business owners should lead by example and adopt a genuine digital mindset to stay competitive in today's modern landscape."

As entrepreneurs and top management in SMBs have a large influence across a firm's operations, their experience and attitude towards digital technology can determine the extent of digital adoption in their organisation. A prominent theory in the literature titled 'The Diffusion of Technology Theory' (Rogers,1962) identified the characteristics of the leader of a company as a key factor for the adoption of Information Communication Technologies (ICT) by SMBs.[20] As top management in SMBs tend to oversee all aspects of a firm's operation, their attitude towards digital, their own digital skills and knowledge and innovativeness will be a driver for digital adoption. Management who have strong prior experience with digital are better at gauging the benefits and associated risks of ICT adoption and therefore more likely to be strong supporters of it.

SMBs operate in a wide range of operational structures, but those who struggle with digital adoption may be operating in an organisational culture which is less innovative. An organisational culture that is more adaptable and open to change will likely lead to an increased uptake of digital, and a higher success rate of implementing such technology. While large firms are found to undertake more innovation than their smaller counterparts, SMBs are well placed to implement innovative solutions as these often require close collaboration and coordination between different teams.

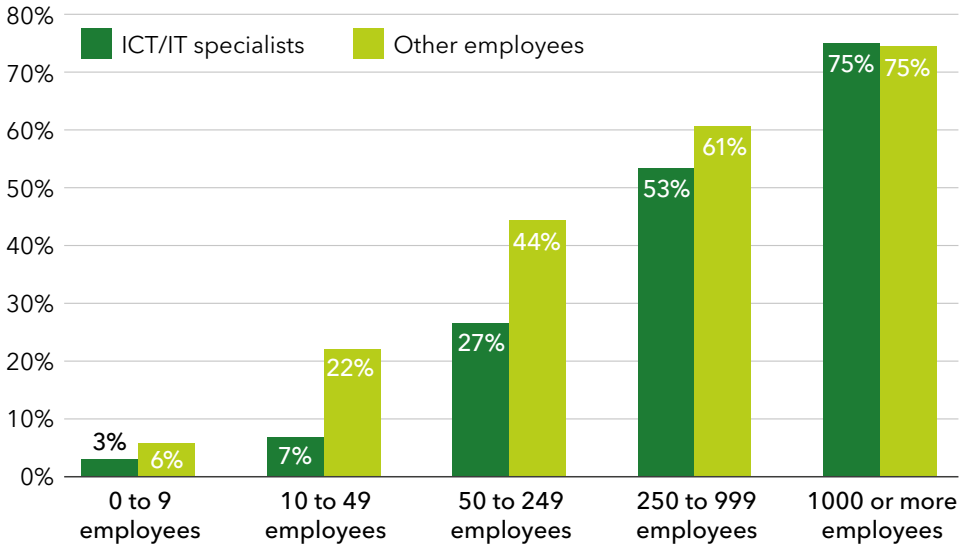
Resource constraints can pose a significant barrier for digital uptake within SMBs. Many SMBs operate with significant financial constraints, making paying for high cost digital investments with long and uncertain pay-offs from internal funds (profits or past reserves) difficult. Moreover, compared to larger organisations, SMBs face additional challenges in accessing external finance, as lenders find it difficult to find information to form a judgement about the company's ability to repay the loan. This is particularly the case where the SMB is a new entrant with no financial track record, or has little or no physical collateral to offer the lender.

20 Rogers, E. M., (1962), 'Diffusion of Innovations'.

The digital skills and experience of employees is another major factor affecting digital adoption among SMBs. An influential paper by Arendt suggested that the main barrier to ICT adoption for SMBs was lack of knowledge, skills, and experience with digital technology among both their owners and employees.[21] Without the appropriate skills, Arendt argued, SMBs lacked the knowledge to select the right technology for their businesses.

Furthermore, they are unable to effectively implement digital solutions to reap maximum benefits. The digital skills shortage within SMBs may stem from their low provision of digital training. According to ONS data, only 22% of businesses with 10 to 49 employees offered digital training to their non-ICT specialist employees in 2018. This is substantially below the 61% and 75% of the firms with between 250 and 999 and over 1,000 employees, respectively.

Fig. 17: Proportion of firms providing training to develop ICT/IT skills, by size of business, 2018



Source: ONS (2019)

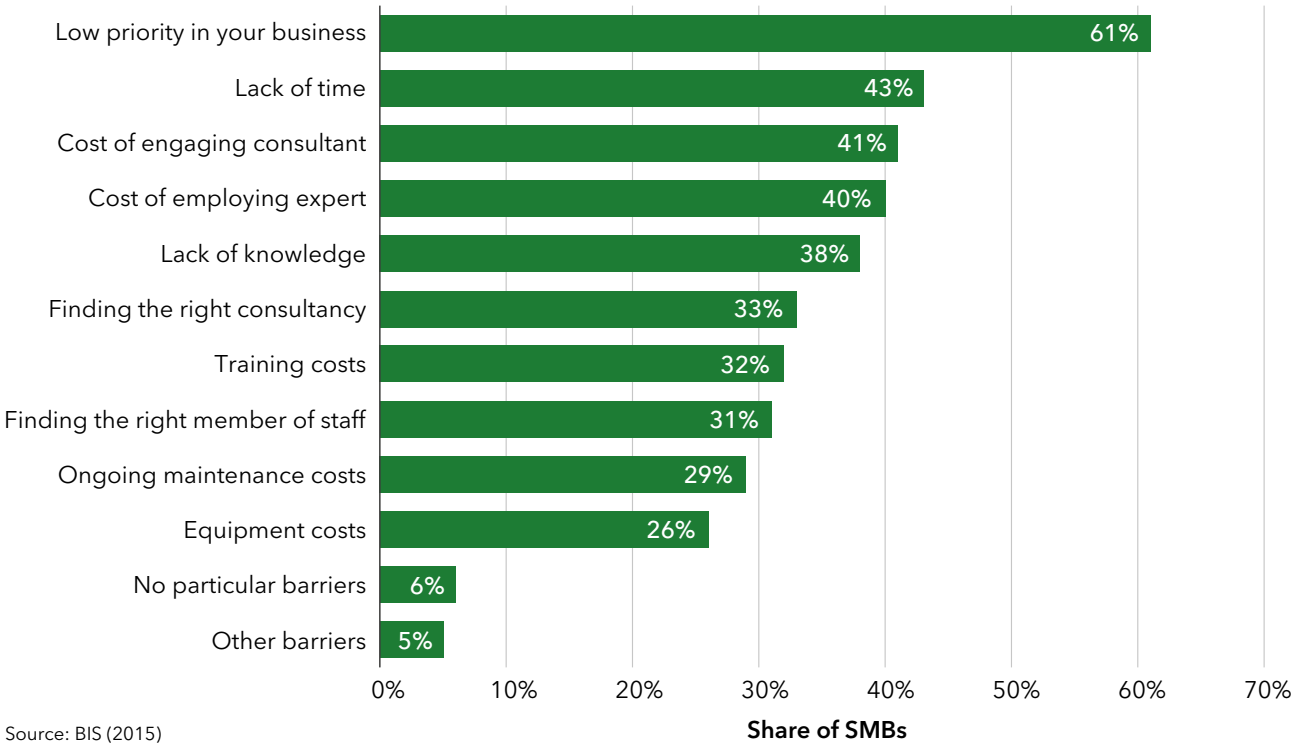
External factors beyond SMBs' control contribute to their level of digital adoption. The first of these factors is digital infrastructure, which affects not only SMBs but all firms in the economy. Infrastructure conducive to digital adoption includes reliable and fast internet, as well as the high power and bandwidth of those connections. The availability of reliable digital infrastructure significantly impacts SMBs' ability to benefit from digital investments and as such their adoption levels.

Education systems that are slow to adapt to evolving digital demands stifle digital adoption, reducing the supply of digitally-skilled employees and external experts that SMBs often rely on. Due to their size and relatively more constrained resources, SMBs are more reliant on external expertise. The availability and quality of external ICT expertise will affect the extent of digital adoption by SMBs. Other determinants of technology adoption include competitive pressure, industry- and market- specific characteristics, government support and training.

21 Arendt, L., (2008), 'Barriers to ICT adoption in SMEs - How to Bridge the Digital Divide?', Journal of Systems and Information Technology.

Historically, SMBs in the UK have not prioritised digitalisation and have been resource constrained when it comes to investing in ICT. Research commissioned by the Department for Business, Innovation and Skills found that amongst SMBs who reported not using digital to its maximum extent, 61% said making better use of their digital resources was a low priority (Fig. 18).[22] Resource constraints including lack of time, costs of contracting external consultants and employing digital experts are cited as reasons for not using digital to the full extent by over 40% of SMBs surveyed.

Fig. 18: Share of SMBs reporting reasons for not being able to use digital to its full extent, 2014



Source: BIS (2015)

22 Department for Business, Innovation and Skills, (2015), 'Digital Capabilities in SMEs: Evidence Review and Re-survey of 2014 Small Business Survey respondents', BIS Research Paper Number 247, September.

4 THE BENEFITS OF IMPROVING CONNECTIVITY AND MAKING SMBS 'MORE DIGITAL'

This study has demonstrated that UK SMBs typically have a lower propensity to adopt digital technology than their larger counterparts and international equivalents. This means they are missing out on opportunities to transform their businesses, and the potential benefits that this would bring.

In this chapter, we examine two aspects of these lower adoption rates. Firstly, we ask to what extent SMBs' ability to take advantage of the digital opportunity is constrained by their location in areas with poor digital connectivity. Secondly, we consider to what extent it is linked to SMBs' inclination to adopt digital technology—based on typically low digital skill levels, and attitudes that could be altered with greater investment in ICT training.

In order to analyse these questions, we constructed an Index that maps both factors for each NUTS3 region. We then used this Index to carry out two "thought experiments" that investigated the potential impact on GDP of improving the digital performance of below-average areas.

4.1 The SMB Digital Propensity Index

To measure the different connectivity situations faced by SMBs, and their employees' varying skills and attitude towards digital technologies, we constructed the SMB Digital Propensity Index. This is comprised of two key sub-components: digital infrastructure, reflecting the connectivity situation facing the businesses, and digital inclination, reflecting the extent to which the firms choose to use those digital tools that are available to them in principle.

Due to data availability we have constructed the Index for the 170 of the 173 NUTS3 localities, so that we can explore at a local level where SMBs could potentially gain the most, if the connectivity they face, or their aptitude for using digital technology, improved.[23]

4.1.1 The digital infrastructure component

SMBs across the UK face different degrees of access to digital infrastructure, reflecting the quality of that infrastructure available in the local area in which they operate. We have weighted together OFCOM data on broadband speed, and access to voice and 4G coverage inside and outdoors, in order to derive the infrastructure component of the overall Index (see Appendix 3).[24]

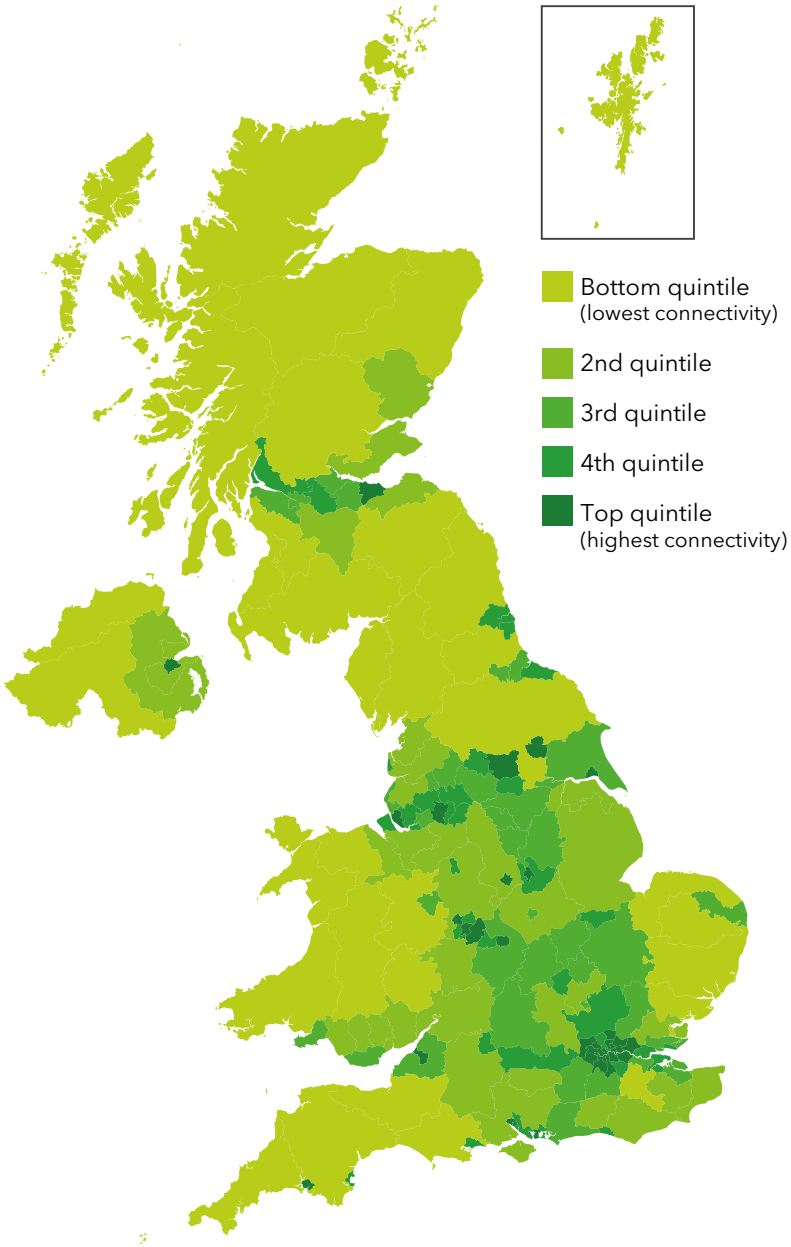
23 We have been unable to calculate Index scores for Darlington, Leicester and Luton.

24 In greater detail, for or broadband speed, we have considered the proportion of properties with access to superfast (at least 30 Mbit/s), ultrafast (at least 300 Mbit/s) and full-fibre broadband. These are the key indicators used by Ofcom to describe the quality of fixed broadband services at the local level. Coverage of 4G mobile services is the second data source behind the infrastructure Index. In particular, we focus on the proportion of UK landmass with good 4G coverage from all four mobile operators and we look at three types of environments: indoor, outdoor and road coverage. Lastly, the third data source of the infrastructure component employs the availability of voice coverage from all four operators. In a similar fashion to the 4G analysis, we consider indoor, outdoor and road coverage.

As Fig. 19 indicates, cities and urban areas do particularly well on the infrastructure component of the Index, with Kingston upon Hull, Belfast, and Barking & Dagenham and Havering, recording the highest scores on this measure. By contrast, predominantly rural areas score badly, with the Orkney Islands, Shetland Islands, and Western Islands recording the lowest scores. Some confirmation of this in England comes from the average rank of English localities on the DEFRA rural-urban scale. The predominantly urban areas have a much lower average ranking on the infrastructure component (and therefore better connectivity), than the urban with significant rural and predominantly rural localities.

At the same time, there is a clear negative correlation between the share of SMB jobs in total private sector jobs and the score of each locality on the infrastructure component of the Index. This is likely to simply reflect the fact that SMBs are, proportionately, more important employers in rural areas than urban areas, and rural areas tend to be more poorly served by the UK's current digital infrastructure.

Fig. 19: Map of the infrastructure component of the SMB Digital Propensity Index, split by quintile



Source: Oxford Economics

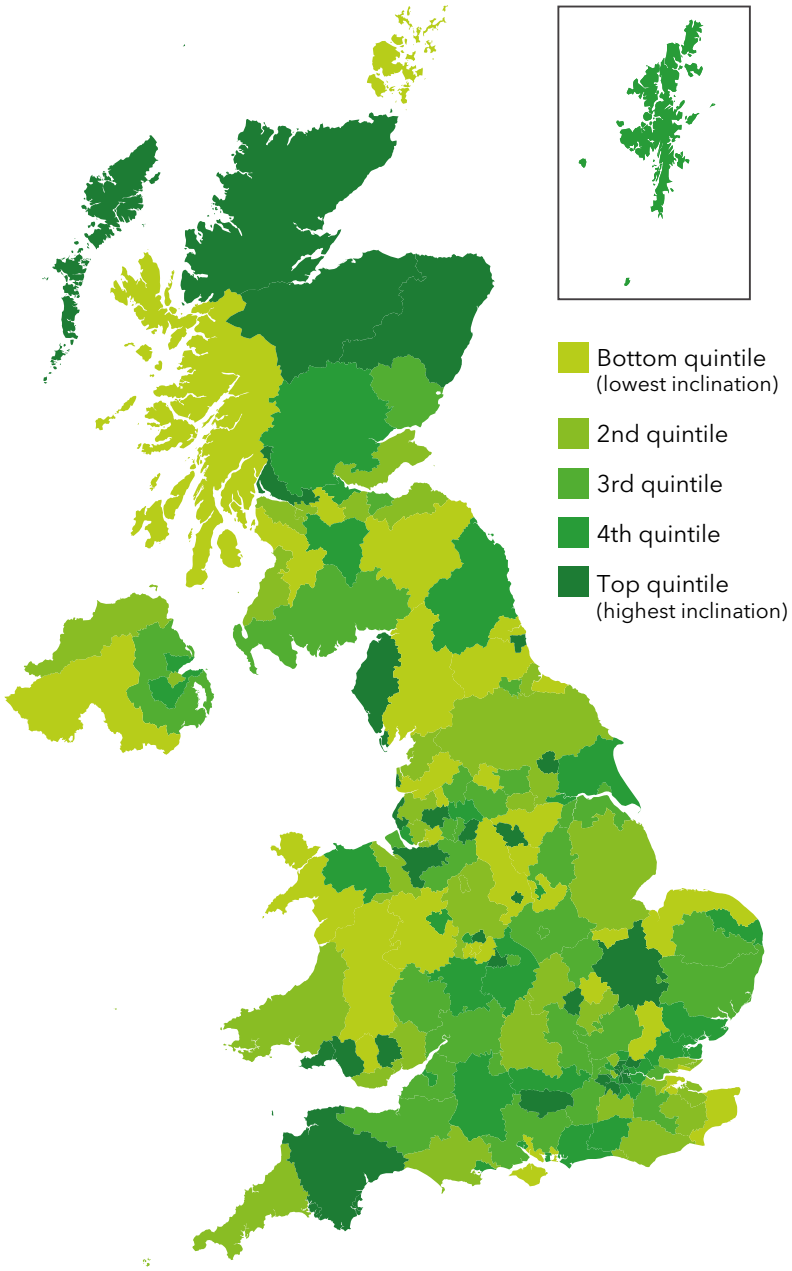
97

regions have above average digital infrastructure.

4.1.2 Digital inclination component

The digital inclination component of the Index draws on survey data from BEIS Small Business Survey and the GlobalWebIndex. In particular, we use respondents' answers to questions on the ICT software and hardware they use regularly at work. As we believe technology adoption varies by industry, we have categorised the survey data by industry and undertaken the factor analysis on the same basis. The NUTS3 region scores are calculated by weighting the industry factor scores by the industrial pattern of SMB employment in each region.

Fig. 20: Map of the inclination component of the SMB Digital Propensity Index, split by quintile



Source: Oxford Economics

It is more difficult to discern any regional pattern on SMBs' inclination to use digital technology (Fig. 20). The analysis of the average rank according to the DEFRA urban versus rural classification for England shows a much less distinct pattern than holds for connectivity; so people who work at SMBs in urban areas are only slightly more inclined to use digital tools than their counterparts in rural ones. Some confirmation of this comes from the rank correlations between the Index and the number of employees at SMBs. This is very low, suggesting staff in areas where there are large numbers of employees at SMBs aren't any more or less likely to be inclined to use digital tools.

The NUTS3 areas where staff at SMBs are found to have the highest inclination to use digital tools are found in Milton Keynes, Haringey and Islington, and Lewisham and Southwark. The regions where the Index suggests SMBs have the lowest inclination to use digital tools are Warrington, Medway and the Isle of Anglesey.

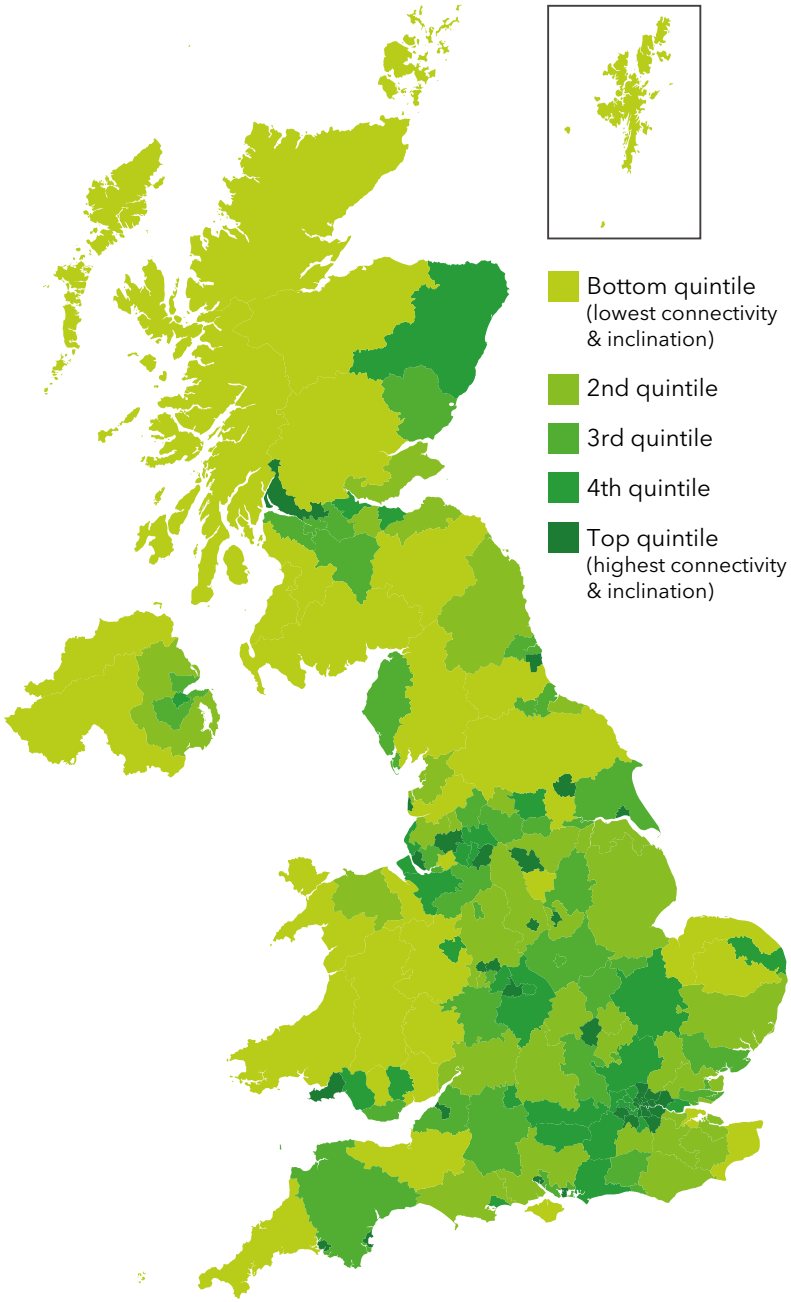
4.1.3 The combined Index

Combing these two components gives us the SMB Digital Propensity Index. The scores for this Index are shown in Fig. 21.

The SMBs with the greater connectivity and inclination to use digital tools tend to be located in more urban areas. This is confirmed by the average rank of the English NUTS3 regions grouped according to DEFRA's urban versus rural categories, where the average rank of the predominantly urban areas is significantly lower than its equivalent for predominantly rural ones. It is also supported by a small positive correlation between the Index and employment numbers at SMBs and a much higher negative rank correlation between the Index and the share of employment supported by SMBs.

Looking at the Index in detail the top three preforming regions are Milton Keynes, Lewisham and Southwark, and Haringey and Islington. Broadly speaking, SMBs in London score highly. The worst performing regions are situated in more rural regions; The Orkney Islands, Isle of Anglesey and the Scottish Borders.

Fig. 21: Map of the SMB Digital Propensity Index, split by quintile



Source: Oxford Economics

4.2 What could be gained by improving SMBs' digital performance?

To investigate what might happen if the connectivity that SMBs face improved, and their inclination to use digital technology increased, we undertake two thought experiments. Both are intended as signposts to the gains potentially available to SMBs, if their use of digital tools improved along the lines envisaged in the UK Government's "Digital Strategy".

4.2.1 Digital infrastructure thought experiment

The availability of digital infrastructure is an important factor determining how firms conduct their business. So the first thought experiment that we undertake looks at what would happen to the UK's economic performance if digital infrastructure were to be improved in the low-performing regions. More specifically, we look at what would happen to UK GDP, if the infrastructure component of the Digital Propensity Index were increased to the present national average, in the localities where it is currently below that average.

To do this, we first identify the regions that have a below average digital infrastructure score.[25] Next, we boost the digital infrastructure scores in these regions to the average score; this give us a corresponding rise in the region's SMB Digital Propensity Index score. Using an estimated correlation coefficient between the Index score and productivity, we then convert this rise in the region's SMB Digital Propensity Index score to a rise in SMB productivity.[26] We then multiply the rise in SMB productivity by the number of SMB employees in a region, to get the associated rise in GDP in a region. Summing these GDP rises across regions gives our national estimate.

£5.4 bn

in additional GDP in 2018, if SMBs had better digital infrastructure.

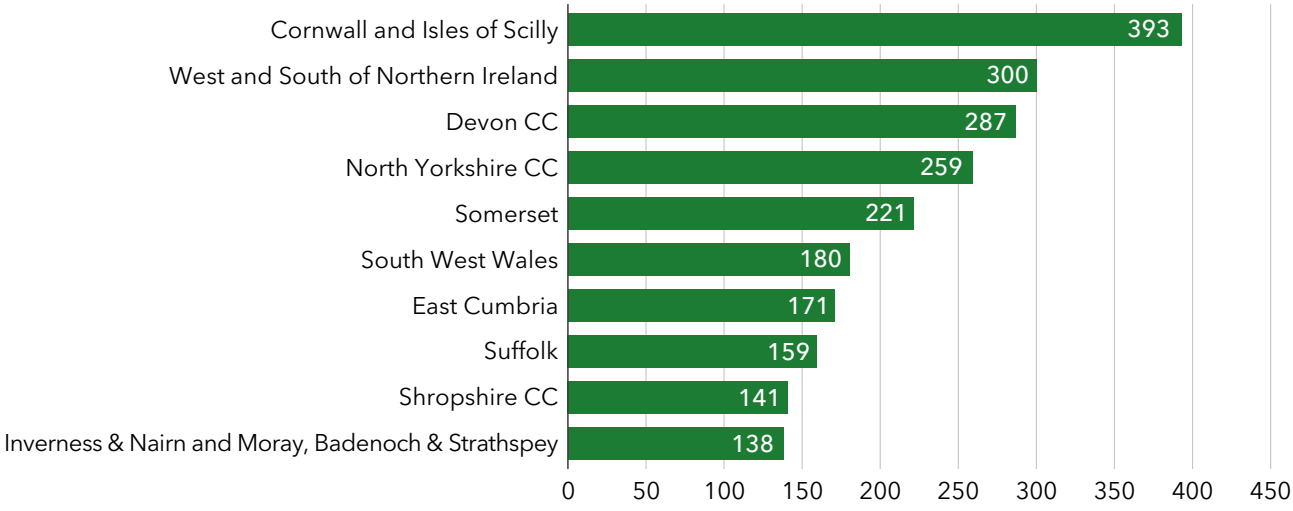
Our estimate relies on the correlation between our Digital Index score and productivity across regions in 2018 and does not imply any causal inferences. In other words, for the increase in the SMB Digital Propensity Index to translate into an increase in productivity, a large number and variety of other enabling factors would also need to change. Our estimates assume that these enabling factors also change simultaneously with the change in infrastructure.

We find that, had SMBs faced that digital infrastructure environment in 2018, UK GDP would have been £5.4 billion—or 0.3%—higher than the actual out-turn.[27] This addition to the UK's annual output would have been broadly equivalent to the amount produced in certain medium-sized cities, such as Portsmouth, Plymouth, or Stoke-on-Trent, or by the UK aviation transport services sector, or the textile and clothing manufacturing sector.

25 There are 73 regions.
26 A coefficient of correlation measures the statistical association between two variables, in this case the SMB Digital Propensity Index score and SMB productivity across regions. It does not imply causality.
27 ONS, (2019, 'GDP quarterly national accounts, UK: July to September 2019', 20 December.

The top 10 NUTS3 regions in which SMBs would benefit from the thought experiment on raising connectivity are shown in Fig. 22. SMBs in Cornwall and the Isles of Scilly would receive the greatest boost in their contribution to gross value added at £393 million, followed by the West and South of Northern Ireland and Devon. The regions are in predominantly rural areas.

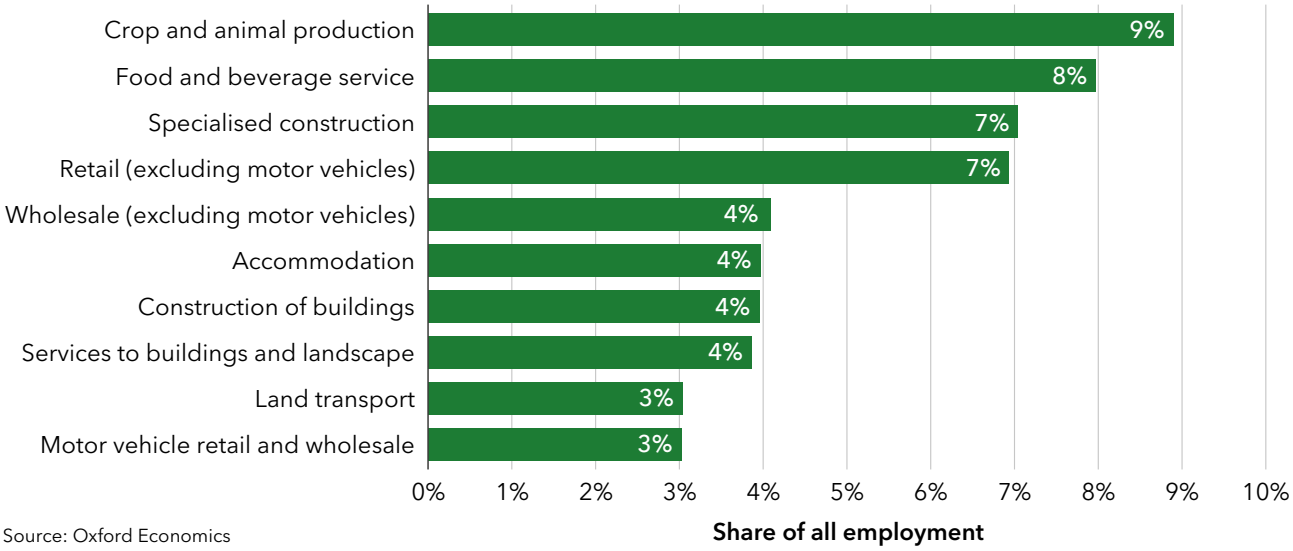
Fig. 22: The 10 NUTS3 regions receiving the largest boost to gross value added from SMBs enjoying greater connectivity



Source: Oxford Economics

Analysis of the industrial composition of SMB employment in the top 10 NUTS3 regions receiving the largest boost to gross value added from greater connectivity shows some of the sectors which stand to benefit.[28] These include farming, hospitality, retail, and parts of the construction industry (Fig. 23). With the exception of wholesaling, the other nine sectors have a greater share of SMB employment than at the national level.

Fig. 23: The industrial composition of SMB employment in the 10 NUTS3 regions estimated to receive the largest boost to gross value added from greater connectivity



Source: Oxford Economics

28 Analysis undertaken at the two digit Standard Industrial Classification (SIC) level.

4.2.2 Digital inclination thought experiment

In our second thought experiment, we explore the potential boost to GDP that SMBs could make through better uptake of digital technology. To do this, we first identify the 91 regions with a lower-than-average digital inclination component. Within these regions, industries that are performing worse than average when it comes to technological usage are then raised to the average for that industry. Again, this leads to a rise in the SMB Digital Propensity Index score, which we then map to a rise in productivity using the correlation coefficient. Combining this productivity rise with SMB employment numbers, we can create an estimate for the rise in GDP.[29]

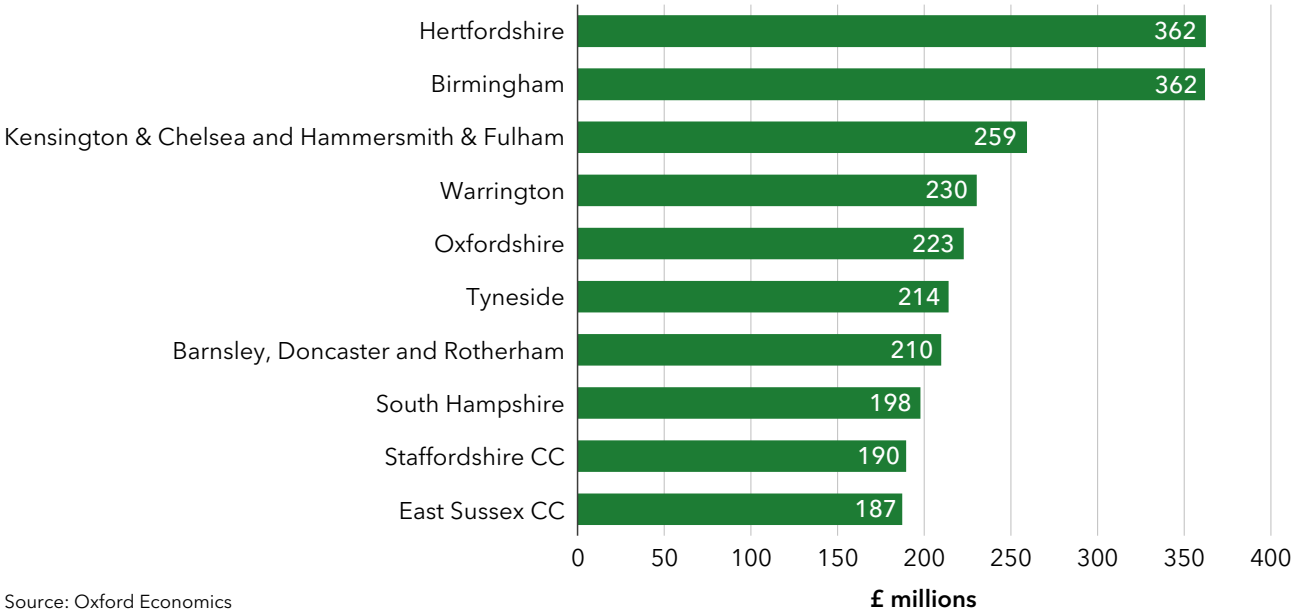
£9.9 bn

in additional GDP in 2018, if SMBs made greater use of the digital tools available to them.

In this case we find that, had businesses made greater use of the digital tools available to them in 2018, to that extent, then UK GDP would have been £9.9 billion—or 0.5%—greater than it turned out. That additional production is a little more than the value of GDP contributed by the cities of Nottingham, Bradford, or Coventry, or UK industries such as postal and courier services, TV and radio programming and broadcasting activities, or travel agency and tour operator activities.

The NUTS3 regions projected to benefit the most from SMBs having a greater inclination to use digital tools are shown in Fig. 24. Hertfordshire and Birmingham are both predicted to experience an increase in gross value added of £362 million a year, if their SMBs' inclination to use digital tools increased to the average for the industries in which they operate.

Fig. 24: The 10 NUTS3 regions receiving the largest boost to gross value added from SMBs using more digital tools

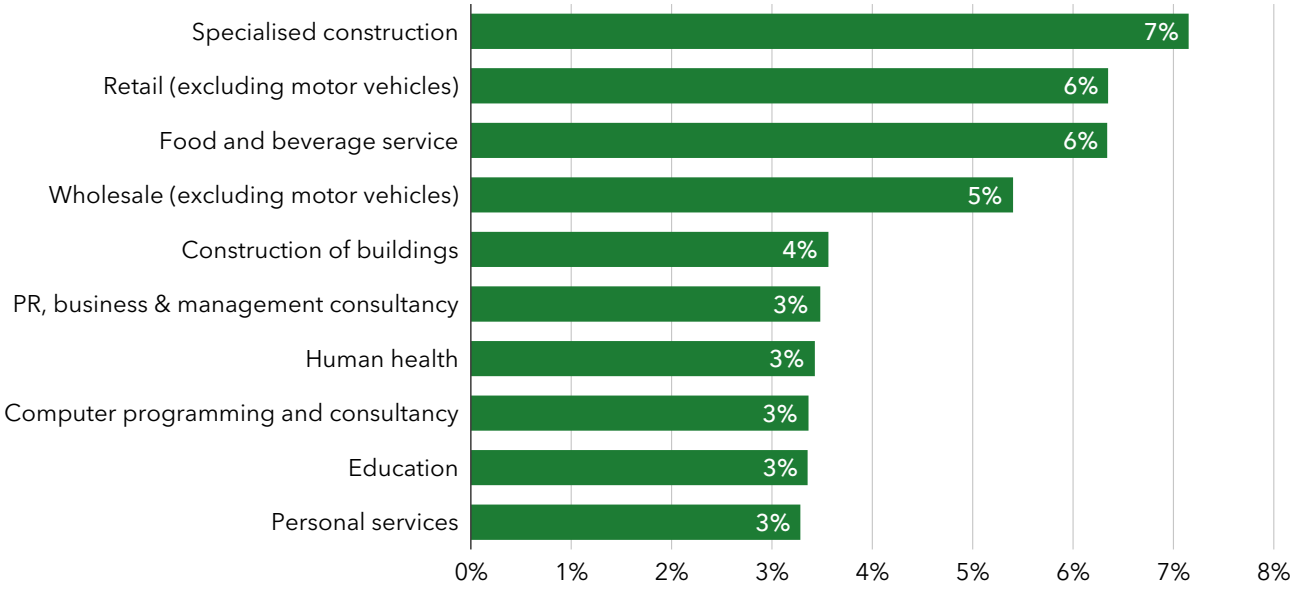


Source: Oxford Economics

29 The estimate again relies on the correlation between the SMB Digital Propensity Index score and productivity across regions in 2018 and does not imply any causal inferences.

The industries in which SMB employment is concentrated in the 10 NUTS3 regions estimated to receive the largest boost to gross value added from using more digital tools are quite diverse (Fig. 25). SMBs in specialised construction (which includes electrical and plumbing installation), retailing, and food and beverage all rank among those which could benefit significantly. Six out of the 10 sectors have a greater share of SMB employment than at the national level.

Fig. 25: The industrial composition of SMB employment in the 10 NUTS3 regions estimated to receive the largest boost to gross value added from using more digital tools



Source: Oxford Economics

4.2.3 Combined experiment

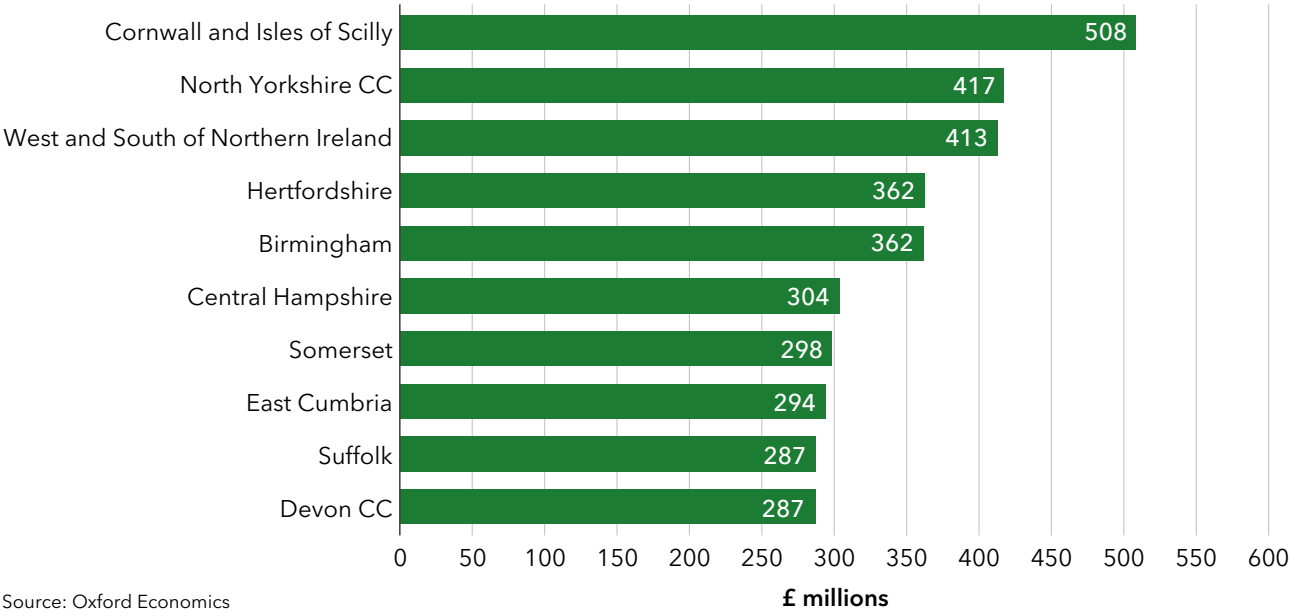
The final thought experiment is a combination of boosting both the digital infrastructure and inclination scores. The associated rise in GDP here is £15.3 billion, equivalent to 0.8% of the 2018 UK GDP level. That additional amount surpasses even the GDP performance of quite large cities such as Bristol, Liverpool, and Sheffield. It is also in broadly the same region as the total output of key UK industries, such as motor vehicle manufacturing, hotel and other temporary accommodation services, or the manufacture of computer, electronic and optical products.

£15.3 bn

more GDP in 2018, if SMBs had greater connectivity and inclination to use digital tools.

The 10 regions that benefit the most in our combined thought experiment are shown in Fig. 26. Cornwall and the Isles of Scilly, North Yorkshire and the west and south of Northern Ireland are among the top three. These and the other 108 are shown in Appendix 2.

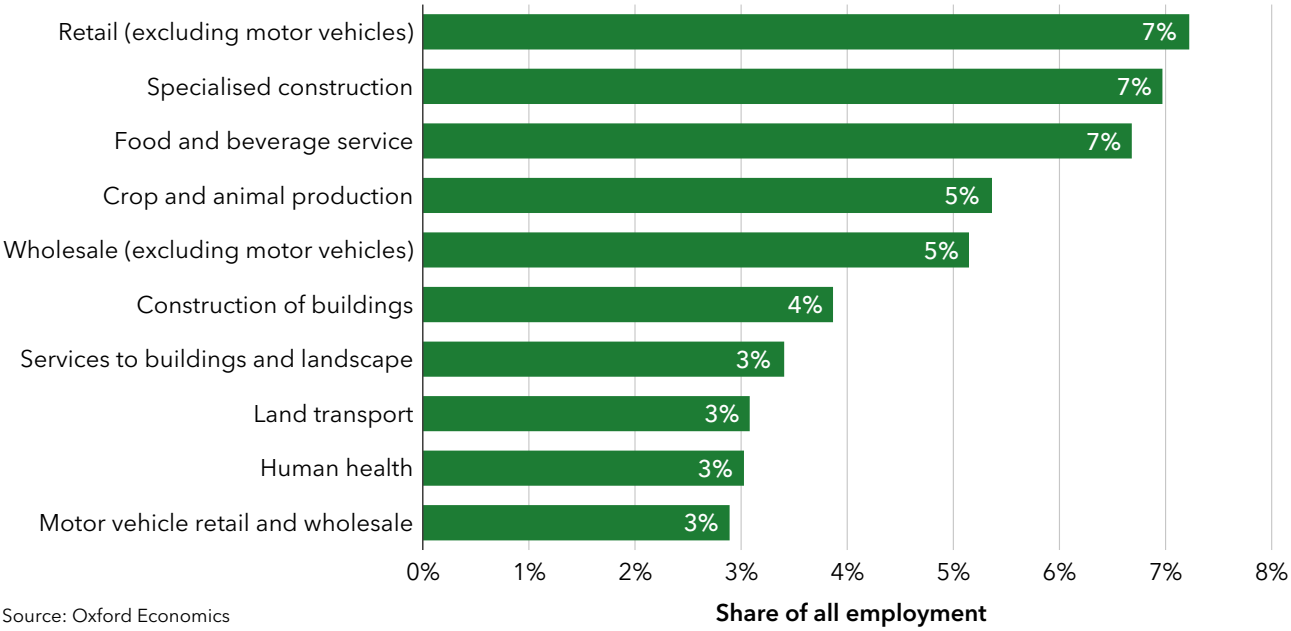
Fig. 26: The 10 NUTS3 regions receiving the largest boost from SMBs both enjoying greater connectivity and using more digital tools



Source: Oxford Economics

The sectors in which there is a lot of SMB employment in the 10 NUTS3 regions receiving the largest boost to gross value added from greater connectivity and digital skills are shown in Fig. 27. SMBs in retailing, specialised construction and food and beverage serving are all well placed to gain from the growth in gross value added. Eight out of the 10 sectors have a greater share of SMB employment than at the national level.

Fig. 27: The industrial composition of SMB employment in the 10 NUTS3 regions estimated to receive the largest boost to gross value added from better digital infrastructure and using more digital tools



Source: Oxford Economics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Tag us!
@sunshinealchemy
#conscious cocktails
#sunshine alchemy
SUNSHINE ALCHEMY
CONSCIOUS COCKTAILS

5 THE FUTURE OF DIGITAL FOR SMBS

Our two thought experiments to signal where the digital transformation of the UK economy could potentially take SMBs were constructed using data on SMBs' current performance levels. They are therefore underpinned by today's technology, infrastructure and productivity.

Of course, the rapid pace of technological change means that the connectivity and digital tools available today will soon be superseded. Existing technologies will improve and be more widely adopted. New technologies will be created that disrupt existing markets, radically altering the prospects for current SMBs for good and bad, and creating opportunities for new entrants.

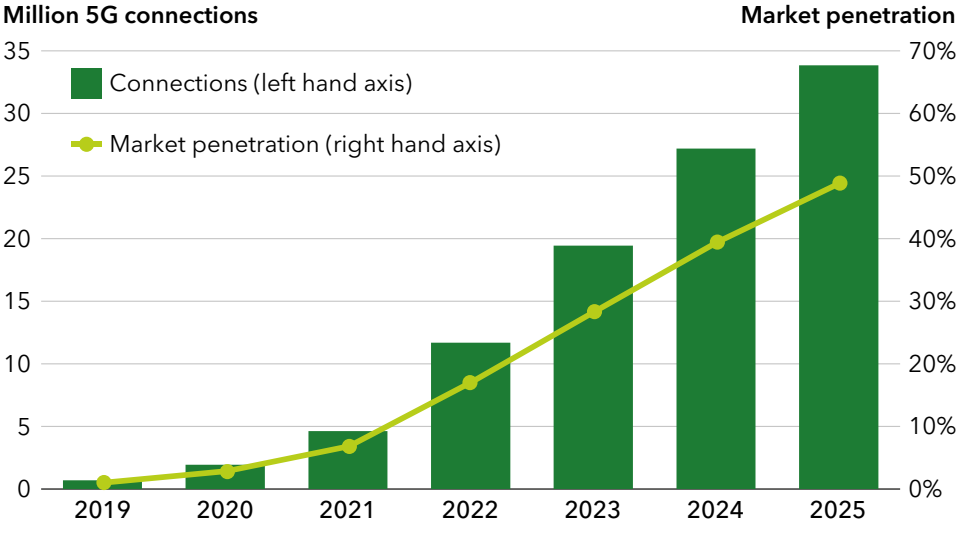
49%

the forecasted market penetration of 5G in 2025, up from 1% in 2019.

As with many new products, it is likely the price of innovative digital tools will come down after they have been first introduced, reflecting competitive pressures. This too will foster adoption rates amongst SMBs.

We can envisage how some of the emerging connectivity development and digital technologies will change the outlook for SMBs. 5G connectivity, for example, is predicted to grow from having a market penetration of 1% in 2019 to 49% by 2025 (see Fig. 28). This will enhance the adoption rates and performance of the existing digital tools SMBs use, but it will also spur new technology and innovation.

Fig. 28: Forecasts of 5G connections and market penetration, 2019 to 2025

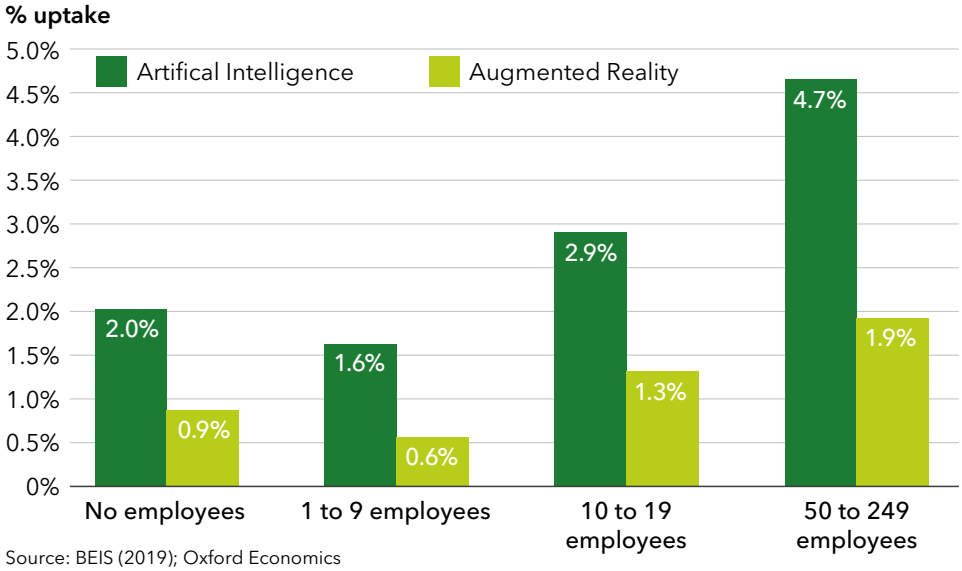


Source: GSMA Intelligence

SMBs' adoption of technologies like Artificial Intelligence (AI) and augmented reality (AR) will grow from their current levels. In 2018, BEIS survey data suggest only 2.0% of SMBs used AI and 0.8% used AR (Fig. 29).[30] The highest usage of both technologies is among medium-sized firms at 4.7% for AI and 1.9% for AR. In the future, these proportions can only grow.

30 Calculated from Wave 4 of the BEIS Longitudinal Small Business Survey data. See BEIS, (2019), 'Longitudinal Small Business Survey: SME employers (businesses with 1-249 employees) – UK, 2018', 24 May, for an overview of the type of data available.

Fig. 29: SMBs' usage of AI and AR in 2018

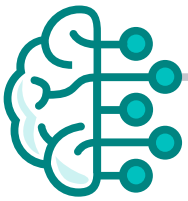


Source: BEIS (2019); Oxford Economics

Business Intelligence (BI) tools may also provide help to SMBs in the future. BI tools are software for analysing data, to help increase the efficiency with which a business is run and improve decision making within a business. Using such tools, SMBs can for example analyse sales data, customer databases or their supply chains, to find insights into ways they can improve.

Open Banking may transform the perennial issue of SMBs' access to external finance. If this occurs, it should accelerate SMBs' adoption of new digital technology, as they will be better able to borrow to finance its purchase and any associated capital equipment.

We can only speculate about the new technologies that will emerge, let alone the rate at which they are adopted by SMBs across the UK. Further intended Making Tax Digital (MTD) roll-out, for example, could act as a catalyst for rapid change and prosperity for SMBs by freeing more time for productive activities such as sales, marketing or training.



2.0%

of SMBs used AI in 2018, while 0.8% used AR.

What we can be more certain of is that however connectivity changes in the future and whatever path the development of digital technology takes, it offers SMBs (and larger firms) in the UK greater opportunity to transform their businesses. As the digital technology advances, the potential boost in productivity its adoption by SMBs delivers will increase. Therefore, the potential for SMBs to boost the UK economy by adopting digital technology will only increase in the coming years.

6 CONCLUSION

SMBs play a critical role in the UK economy, providing 48% of all jobs and 60% of those in the private sector. They have played a particularly important role in recent economic growth, given that SMBs are over-represented within the UK industries that have expanded most rapidly in the previous five years (2013-2018).

However, UK SMBs are not exploiting the potential of digital technology to the same extent as their large counterparts. ONS survey evidence suggests SMBs earn a lower proportion of their turnover from e-commerce—in part reflecting both that a smaller proportion of SMBs possess a website, and that the functionality of SMBs' websites is typically more limited. Despite the impetus of the Making Tax Digital initiative, they also remain less likely to use digital tools to store information about customers and analyse it for marketing purposes, or to use financial management software to help with procurement, invoicing, profit monitoring, etc. A number of reasons have been put forward for the lower adoption rate of digital technology among SMBs. These include:

1. that they are more heavily concentrated in local areas with poor digital connectivity, and
2. that their staff lack the skills to be able to take full advantage of emerging digital technology.

To signpost how SMBs could make a more significant contribution to national income if their connectivity and digital skills improved, we constructed the SMB Digital Propensity Index. We first used this Index to investigate the theoretical economic impact if the NUTS3 regions ranked below-average for their digital infrastructure were raised up to the present national average. According to this analysis, we estimate that SMBs would have contributed £5.4 billion more to UK GDP than the actual out-turn in 2018—an increase of 0.3%.

Next, we estimated what the economic impact would be of raising all SMBs in areas with below-average "digital inclination" to their own industry averages. Through this analysis, we estimate that UK GDP would have been £9.9 billion—or 0.5%—greater than it turned out in 2018.

Finally, we combined both estimates to establish the potential economic impact of boosting both the digital infrastructure and digital inclination scores on our Index. **The associated rise in GDP is £15.3 billion, equivalent to 0.8% of the 2018 UK GDP level.**

It should be noted that these estimates were constructed using data available on SMBs' current performance, based on existing technology, infrastructure, and productivity levels. In the future, as the role of digital technology grows, the opportunities it offers to SMBs, their local areas, and the UK as a whole, is likely to be far greater.

APPENDIX 1: THE SMB DIGITAL PROPENSITY INDEX IN FULL

The ranking of the NUTS3 region scores for the SMB Digital Propensity Index are shown in Fig. 30. Each component and the total are ranked separately. A low rank suggests that SMBs in that NUTS3 region have high connectivity or inclination to use digital technology. A high rank suggests the opposite.

Fig. 30: NUTS3 regions rankings according to the SMB Digital Propensity Index

NUTS3 Region	Total Rank (where the region ranked 1 has the best connectivity and contains SMBs with the greatest inclination and ability to use digital technology and 170 the worst)	Infrastructure Rank (where the region ranked 1 has the best connectivity, and 170 the worst)	Inclination Rank (where the region ranked 1 contains SMBs with the greatest inclination and ability to use digital technology, and 170 the worst)
Milton Keynes	1	65	1
Lewisham and Southwark	2	7	3
Haringey and Islington	3	16	2
Tower Hamlets	4	9	9
Hounslow and Richmond upon Thames	5	11	13
York	6	25	11
Redbridge and Waltham Forest	7	10	17
Westminster	8	35	10
Solihull	9	58	5
Merton, Kingston upon Thames and Sutton	10	17	18
Sunderland	11	54	6
Greater Manchester North West	12	53	7
Derby	13	14	22
Swansea	14	75	4
Lambeth	15	19	26
Kingston upon Hull, City of	16	1	85
Torbay	17	50	14
Blackpool	18	47	19
Bristol, City of	19	5	39
Greater Manchester South East	20	51	15
Hackney and Newham	21	6	37
Portsmouth	22	8	38
Plymouth	23	29	34
Sheffield	24	83	8
Barking & Dagenham and Havering	25	3	48
Camden and City of London	26	45	32
Southampton	27	24	46
Bromley	28	46	40
Wolverhampton	29	34	45
Enfield	30	27	47
East Dunbartonshire, West Dunbartonshire and Helensburgh & Lomond	31	66	24
Bexley and Greenwich	32	22	52

NUTS3 Region	Total Rank	Infrastructure Rank	Inclination Rank
Walsall	33	64	31
Nottingham	34	13	63
Liverpool	35	15	61
Sefton	36	72	30
Wandsworth	37	4	68
Croydon	38	23	60
Brent	39	26	59
Bournemouth and Poole	40	42	55
Greater Manchester North East	41	61	44
Cambridgeshire CC	42	92	23
Cheshire West and Chester	43	120	12
Harrow and Hillingdon	44	21	79
Leeds	45	31	70
Coventry	46	28	80
Edinburgh, City of	47	20	89
Telford and Wrekin	48	85	36
Belfast	49	2	111
Gwent Valleys	50	105	33
Bridgend and Neath Port Talbot	51	111	28
Falkirk	52	88	41
North Hampshire	53	106	35
Ealing	54	30	91
Manchester	55	38	87
Greater Manchester South West	56	33	99
West Sussex (South West)	57	93	43
Barnet	58	36	103
Berkshire	59	67	66
Swindon	60	62	77
Hertfordshire	61	60	81
Aberdeen City and Aberdeenshire	62	137	21
Warwickshire	63	90	51
Norwich and East Norfolk	64	101	49
Wirral	65	56	90
West Surrey	66	71	73
Kensington & Chelsea and Hammersmith & Fulham	67	18	131
Birmingham	68	12	140
Thurrock	69	63	97
East Merseyside	70	59	104
East Riding of Yorkshire	71	91	65
Brighton and Hove	72	39	129
Outer Belfast	73	107	58
North Northamptonshire	74	81	82
Bath and North East Somerset, North Somerset and South Gloucestershire	75	95	71
East Lancashire	76	77	92
West Sussex (North East)	77	116	57

NUTS3 Region	Total Rank	Infrastructure Rank	Inclination Rank
Leicestershire CC and Rutland	78	104	75
South Lanarkshire	79	124	54
Devon CC	80	144	29
Calderdale and Kirklees	81	79	101
North Nottinghamshire	82	89	93
Worcestershire	83	115	67
Stoke-on-Trent	84	55	132
Angus and Dundee City	85	112	78
Peterborough	86	40	150
Wakefield	87	69	117
Wiltshire	88	128	56
Tyneside	89	48	144
Hartlepool and Stockton-on-Tees	90	73	115
West Cumbria	91	149	27
Cardiff and Vale of Glamorgan	92	70	122
Glasgow City	93	82	113
Essex Thames Gateway	94	80	114
North Lanarkshire	95	37	156
Cheshire East	96	108	94
South Hampshire	97	41	154
Inverclyde, East Renfrewshire and Renfrewshire	98	78	120
Buckinghamshire CC	99	119	76
Sandwell	100	32	160
Essex Haven Gateway	101	138	53
Heart of Essex	102	132	64
Oxfordshire	103	98	110
North and North East Lincolnshire	104	114	98
Kent Thames Gateway	105	97	112
East of Northern Ireland	106	118	88
East Surrey	107	86	119
Dudley	108	44	159
Bradford	109	49	155
Gloucestershire	110	117	96
Barnsley, Doncaster and Rotherham	111	76	141
South Teesside	112	52	158
Blackburn with Darwen	113	74	146
West Northamptonshire	114	99	123
Central Bedfordshire	115	103	126
West Lothian	116	94	135
West Kent	117	142	72
Northumberland	118	148	50
Southend-on-Sea	119	43	165
Staffordshire CC	120	109	125
Bedford	121	96	139
Clackmannanshire and Fife	122	110	128
West Essex	123	87	145
Central Hampshire	124	133	100

NUTS3 Region	Total Rank	Infrastructure Rank	Inclination Rank
Conwy and Denbighshire	125	155	42
East Lothian and Midlothian	126	125	109
Chorley and West Lancashire	127	127	108
Suffolk	128	136	95
South Nottinghamshire	129	57	161
Lincolnshire	130	134	106
Lancaster and Wyre	131	122	121
Dorset CC	132	140	102
Mid Kent	133	131	118
South and West Derbyshire	134	121	136
East Sussex CC	135	123	133
Monmouthshire and Newport	136	129	127
Perth & Kinross and Stirling	137	153	62
Inverness & Nairn and Moray, Badenoch & Strathspey	138	166	20
Herefordshire, County of	139	147	84
East Kent	140	102	157
Mid Lancashire	141	113	153
Somerset	142	150	86
South Ayrshire	143	139	124
Flintshire and Wrexham	144	135	134
North of Northern Ireland	145	145	105
Breckland and South Norfolk	146	154	83
East Derbyshire	147	100	162
Caithness & Sutherland and Ross & Cromarty	148	167	25
North Yorkshire CC	149	146	116
Durham CC	150	141	152
Dumfries & Galloway	151	162	74
East Ayrshire and North Ayrshire mainland	152	143	151
Shropshire CC	153	151	147
South West Wales	154	157	130
Eilean Siar (Western Isles)	155	170	16
Medway	156	68	169
Central Valleys	157	130	166
Isle of Wight	158	126	167
East Cumbria	159	158	143
Cornwall and Isles of Scilly	160	165	107
West and South of Northern Ireland	161	160	137
Warrington	162	84	170
Shetland Islands	163	168	69
Gwynedd	164	164	138
Powys	165	161	148
North and West Norfolk	166	152	163
Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute	167	163	149
Scottish Borders	168	156	164
Isle of Anglesey	169	159	168
Orkney Islands	170	169	142

Source: Oxford Economics

APPENDIX 2: ESTIMATES OF THE BOOST TO GROSS VALUE ADDED FROM THE COMBINED EXPERIMENT

The boost to gross value added in the 118 NUTS3 region that benefit from the combined thought experiment.

Fig. 31: Estimated boost to gross value added in 2018 from the combined thought experiment

NUTS3 Region	Gain (£ million)
Cornwall and Isles of Scilly	508
North Yorkshire CC	417
West and South of Northern Ireland	413
Hertfordshire	362
Birmingham	362
Central Hampshire	304
Somerset	298
East Cumbria	294
Suffolk	287
Devon CC	287
Shropshire CC	277
South West Wales	267
Kensington & Chelsea and Hammersmith & Fulham	259
East Sussex CC	253
Lincolnshire	251
Gloucestershire	235
Warrington	230
Oxfordshire	226
Staffordshire CC	221
Tyneside	214
Dorset CC	211
Barnsley, Doncaster and Rotherham	210
Durham CC	209
South and West Derbyshire	206
North and West Norfolk	202
South Hampshire	198
East Kent	191
West Northamptonshire	182
Edinburgh, City of	176
Mid Kent	171
Bradford	171
Breckland and South Norfolk	167
Medway	163
Mid Lancashire	159
Manchester	157
West Essex	156

NUTS3 Region	Gain (£ million)
Cardiff and Vale of Glamorgan	148
South Nottinghamshire	146
Inverness & Nairn and Moray, Badenoch & Strathspey	138
Flintshire and Wrexham	138
Barnet	134
East Surrey	133
Powys	131
Essex Thames Gateway	129
Central Valleys	128
Greater Manchester South West	120
Aberdeen City and Aberdeenshire	119
Lochaber, Skye & Lochalsh, Arran & Cumbrae and Argyll & Bute	118
Calderdale and Kirklees	117
Gwynedd	113
Glasgow City	113
North of Northern Ireland	112
East Derbyshire	112
Herefordshire, County of	111
Ealing	110
Perth & Kinross and Stirling	107
Central Bedfordshire	107
East Ayrshire and North Ayrshire mainland	107
Monmouthshire and Newport	106
Essex Haven Gateway	106
Dudley	102
West Kent	102
Sandwell	102
Cheshire East	100
Scottish Borders	100
Brighton and Hove	100
Northumberland	94
Belfast	92
Clackmannanshire and Fife	91
East of Northern Ireland	90
Isle of Wight	87
Southend-on-Sea	87
Conwy and Denbighshire	87
Inverclyde, East Renfrewshire and Renfrewshire	84
Lancaster and Wyre	83
Chorley and West Lancashire	81
Hartlepool and Stockton-on-Tees	80
Dumfries & Galloway	79
Wiltshire	78
Caithness & Sutherland and Ross & Cromarty	78
North Lanarkshire	75

NUTS3 Region	Gain (£ million)
South Teesside	74
East Merseyside	72
Buckinghamshire CC	72
Peterborough	72
West Cumbria	70
North Nottinghamshire	70
Coventry	68
North Northamptonshire	66
Bedford	66
Isle of Anglesey	63
Kent Thames Gateway	63
East Lancashire	62
Heart of Essex	62
South Ayrshire	55
Wirral	55
Wakefield	52
East Lothian and Midlothian	51
Worcestershire	51
West Lothian	49
Blackburn with Darwen	45
Thurrock	42
West Sussex (North East)	39
Cheshire West and Chester	38
Orkney Islands	37
North and North East Lincolnshire	36
Stoke-on-Trent	33
South Lanarkshire	28
Kingston upon Hull, City of	28
Eilean Siar (Western Isles)	24
Shetland Islands	23
Leicestershire CC and Rutland	13
Angus and Dundee City	9
Bridgend and Neath Port Talbot	9
North Hampshire	8
Outer Belfast	8
Gwent Valleys	5
Norwich and East Norfolk	3

Source: Oxford Economics

APPENDIX 3: CALCULATING THE SMB DIGITAL PROPENSITY INDEX USING FACTOR ANALYSIS

The SMB Digital Propensity Index scores capture both the willingness and ability of businesses in the UK to use digital technology. Each score is based on two over-arching components:

- the *digital inclination* component, which captures the inclination of businesses in each NUTS3 region to use digital technologies in their operations; and
- the *digital infrastructure* component, which captures the telecommunications infrastructure coverage within each NUTS3 region.

We describe each in turn below.

The digital inclination component

The digital inclination component includes three components:

Historic inclination score

This sub-component aims to capture the current use of various kinds of technology across different industries within UK regions.

The historic inclination score is estimated from the UK Small Business Survey (SBS) using questions on whether businesses use different kinds of software in their daily operations.[31] The respondents are then attributed a score based on their responses; higher scores are given to businesses that use a larger variety of technology products in their businesses.

The scores are then aggregated for each industry-region combination using the sampling weights corresponding to that industry-region.

Average digital use potential for each industry

This sub-component aims to capture the inclination of different industries to use digital technology.

We analysed the results of GlobalWebIndex data to understand the propensity for the use of digital technologies by industry.[32] We condensed our findings into digital use scores for 11 industry groups using "factor analysis". Put simply, factor analysis allows us to condense the survey responses into a single score by identifying the common elements in the responses (see Box 1 for further details).

Regional employment shares across different industry

This sub-component aims to capture the nature of the economy in each NUTS3 region, i.e., which industrial sectors are present in each locality.

To account for the sectoral composition of businesses within the region, we also use the distribution of employment across sectors within each NUTS3 region in the Index. This would increase the score for regions which are in the high technology-use sectors.

31 Calculated from Wave 4 of the BEIS Longitudinal Small Business Survey data. See BEIS, (2019), 'Longitudinal Small Business Survey: SME employers (businesses with 1-249 employees) – UK, 2018', 24 May, for an overview of the type of data available.
32 www.globalwebindex.com.

The digital infrastructure component

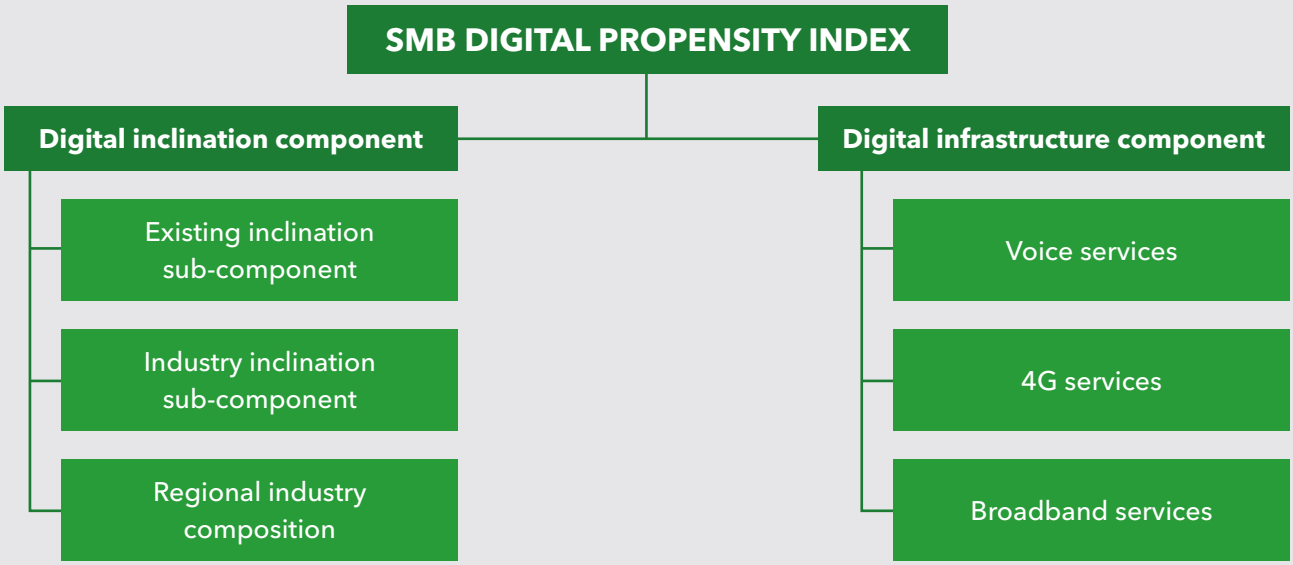
However, the inclination for digital use must be complemented by the availability of the technology infrastructure to enable businesses that want to use digital technologies.

To account for this, one of the components of the Index captures the coverage of various kinds of telecommunications infrastructure using OFCOM data.[33] Specifically, for each NUTS3 region, we calculate an combined average of the coverage of broadband, voice services and 4G penetration services to capture the coverage of slightly different, albeit highly correlated, kinds of communications services.

Combining to create the Index

In each case, the three sub-components are averaged to calculate scores for the two components, which in turn are averaged to calculate the overall scores, and hence the Index (Fig. 32).

Fig. 32: Components of the SMB Digital Propensity Index



Box 1: What is factor analysis?

Factor analysis is a statistical procedure used to condense a large number of potentially correlated variables into a small number of uncorrelated factors. In analysing survey responses, factor analysis determines the extent to which shared variance exists between responses (the correlation between responses) to a develop a limited number of "factor variables" or scores that capture the commonalities between the responses.

Factor analysis is one of the oldest structural models, having been developed by Spearman in 1904. He tried to explain the relations (correlations) among a group of test scores, and suggested that these scores could be generated by a model with a single common factor, which he called 'intelligence,' plus a unique factor for each test.

33 See footnote 23 for more details.

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Oxford Economics was founded in 1981 as a commercial venture with Oxford University's business college to provide economic forecasting and modelling to UK companies and financial institutions expanding abroad. Since then, we have become one of the world's foremost independent global advisory firms, providing reports, forecasts and analytical tools on more than 200 countries, 250 industrial sectors, and 7,000 cities and regions. Our best-in-class global economic and industry models and analytical tools give us an unparalleled ability to forecast external market trends and assess their economic, social and business impact.

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March 2020

The modelling and results presented here are based on information provided by third parties, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

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