The changing landscape of firm-level productivity – anatomy and policy implications

Authors:
Stephen Roper[x]
University of Warwick

Date:
November 2023

The Productivity Institute
Productivity Insights Paper No.020

[x]Warwick Business School, Enterprise Research Centre

Key words
Productivity, firm-level

Authors' contacts
Stephen.Roper@wbs.ac.uk

Suggested citation

S. Roper (2023) *The changing landscape of firm-level productivity – anatomy and policy implications.* Productivity Insights Paper No. 020, The Productivity Institute.

The Productivity Institute is an organisation that works across academia, business and policy to better understand, measure and enable productivity across the UK. It is funded by the Economic and Social Research Council (grant number ES/V002740/1).

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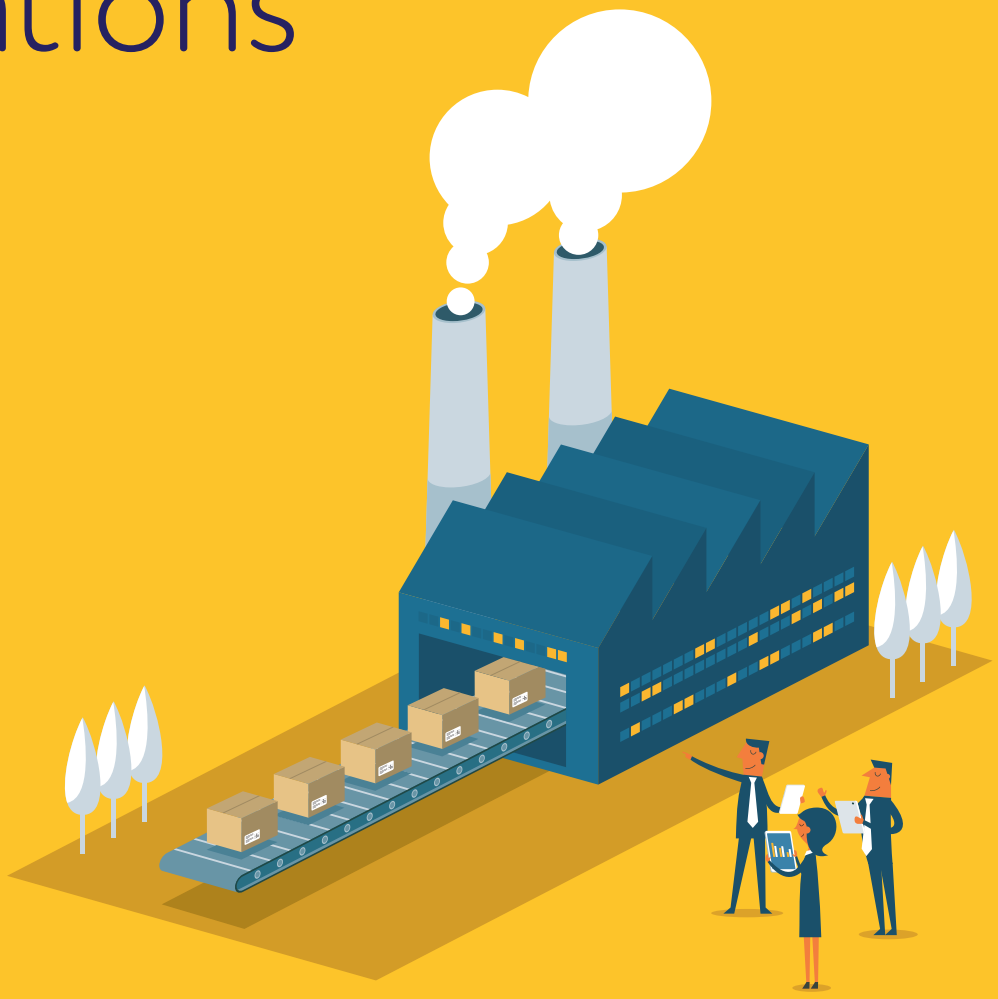


CHAPTER THREE

Stephen Roper
Professor of Enterprise,
Warwick Business School

"What drives productivity growth in a Cambridge spin-out will be very different from a Hebridean weaver."

It is widely recognised that average levels of labour productivity in the UK lag those in many of our international competitors. But how meaningful or helpful are these comparisons of averages? And what do they actually tell us about what is going on in companies, given that productivity varies widely within, as well as between, specific industries?

The productivity disparities between the best firms and the rest have widened in recent years.[1] Other studies have also suggested marked – and perhaps unexpected – differences in sectoral productivity trajectories in the UK.[2 & 3]

This chapter focuses on the firm-level factors which have contributed to the recent productivity performance of the UK. However, sectoral and regional disparities, and the contrasting productivity performance of frontier and non-frontier firms, mean that this cannot be a single story. What drives productivity growth in a Cambridge spin-out will, of course, be very different from a Hebridean weaver. Even within the same sector, the productivity drivers for an international law firm in London will inevitably be very different to a high-street partnership in Halifax.

The situation will be further complicated in future by changing work patterns, which bring uncertain implications. A 2022 CIPD survey, for example, suggested that 41 per cent of firms implementing home working said employees were more productive, but 19 per cent thought they were less productive.[4]

Changing landscape

The next section describes the changing landscape of business productivity in the UK, and this is followed by a review of the data and evidence on some of the factors which may be shaping this landscape. This suggests that the productivity gap between the 'best' and the 'rest' is also reflected in innovation and, potentially, firms' ability to adopt new technologies (see Chapter Five).

I then focus more specifically on the 'rest', looking at productivity drivers at and behind the productivity frontier. The perspective taken is that of the economist or policy maker measuring productivity as either value added per employee or total factor productivity (TFP).

Neither of these measures commonly feature in boardroom discussions of business growth or performance, so I then consider the challenges this raises, while the final section considers the policy implications of the productivity and innovation gaps.

The changing productivity landscape

Recent studies, based on sectoral tangible and intangible investment data, find that the slowdown in UK labour productivity and TFP growth has been greatest in the more intangible, knowledge- and digitally-intensive sectors.[2]

"Overall, we find that the TFP slowdown in intangible-intensive industries ... almost entirely explains the aggregate TFP slowdown ... consistent with the hypothesis that the slowdown has occurred at the technological or knowledge frontier,".[2]

Their emphasis on intangible-intensive, high-value sectors, and 'within-industry' drivers, is consistent with earlier evidence.[3] But why is this pattern emerging? Goodridge and Haskel identify three potential mechanisms:

Firstly, reduced knowledge spillovers or diffusion (knowledge accumulation) linked to weakness in intangible capital services limiting firms' absorptive capacity. For example, the York and North Yorkshire Local Enterprise Partnership (LEP) in their evidence to the TPI Productivity Commission suggested:

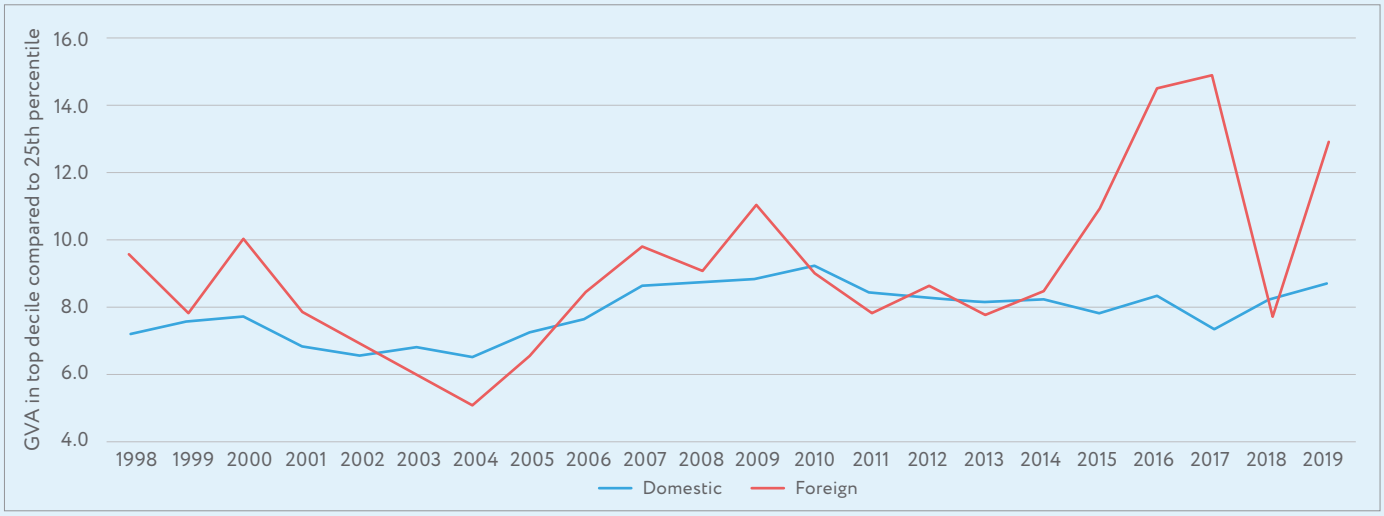
> "There is evidence that the difference between firms within sectors, particularly in the service sector, is increasing over time, and that diffusion of ideas, technologies and business practices is not diffusing from the 'best to the rest' as quickly as it once was, meaning that the best firms are accelerating away from the rest."

Secondly, the lasting impacts of the 2008 financial crisis making access to capital more difficult for firms, particularly in intangible-intensive industries. This effect, intensified by the subsequent impact of Brexit, Covid-19 and rising costs, "has contributed to lower investment growth and slowed efforts in innovation and research and development,".[5]

Policy since 2008 may also have exacerbated this effect, with low interest rates (until recently) leading to investment more strongly oriented to growth than productivity.[6] "Monetary policy is found to significantly reduce the cost of capital for firms pursuing strategies of rapid expansion, while more stable productivity focussed firms would have only benefited indirectly,".

Thirdly, increasing concentrations of market power within intangible-intensive sectors which may be reducing effective competition and increasing barriers to entry.[7&8]

Figure 1: Productivity (GVA per employee) dispersion in the UK: Domestic and foreign firms



Source: Firm level productivity estimates 1998-2019, ONS

Different sectors

Each factor may of course be important in different sectors, leading Coyle and Mei[3] to suggest a need for more firm-level or plant-level analysis to explore distributional patterns or 'common structural shifts' within sectors.

One potentially important aspect of within-sector structure relates to ownership. Coyle and Mei (2023, Figure 18),[3] for example, illustrate very different productivity growth trends for UK-owned firms, multinationals and those firms which were subject to take over.

Bournakis et al., (2019)[9] consider the impact of ownership on regional TFP across the UK and demonstrate that both R&D and intangible investment by multinational enterprises (MNEs) have stronger impacts than that by domestic firms, suggesting this underlies "the superiority of MNEs' organisational and managerial practices in promoting local development,".

More recently, Fingleton et al., (2023)[10] consider the negative effects of Brexit on UK regional productivity, identifying smaller negative effects in London than elsewhere.

Variations within sectors

There is also longstanding evidence of variations in firm productivity within sectors,[11] and a widespread view that the UK is distinctive in having a particularly long tail of low productivity companies which drags down the overall average.

This morphs into the view that large British companies are excellent but are let down by their smaller counterparts, unlike in competitor countries like Germany.[5]

Rehill et al., (2021)[1] examine the firm-level evidence for Ireland and suggest that post-financial crisis productivity recovery by firms in the top decile ('frontier firms') had been stronger than elsewhere in the productivity distribution, indicating 'a widening in the productivity gap between the best and the rest'.[1]

This echoes the findings of OECD research which emphasises the widespread international experience of growing performance gaps between frontier and non-frontier firms.[12]

Frontier firms

Similar increases in dispersion are also evident in the UK if we compare productivity frontier firms (those in the top decile of the productivity distribution) with those towards the bottom (the 25th percentile) in the distribution of labour productivity (see Figure 1). Referring to this data, Chiara Criscuolo (OECD) suggested to the Productivity Commission that "the gap between the top and worst performing firms is much larger in the UK compared to other countries,".[5]

How much does this dispersion matter? In Chapter One we emphasise that the slowdown in aggregate productivity growth post-2010 is primarily due to a sharp fall in growth in firms in the 5th to 9th decile of the productivity distribution. It is this group of firms 'behind the frontier' which therefore must improve their performance if future productivity growth is to be improved.

Productivity dispersion can also have wider economic and social consequences, through increasing divergence in wages between the most and least productive firms. This in turn has been linked to growing inequality and divergence.[13]

A capital approach to productivity drivers

What might explain this pattern of a bigger productivity growth slowdown among intangible-intensive or high value sectors but a growing gap between the frontier firms and the rest (which implies increasing dispersion among firms within sectors)?

Martin and Riley (2023)[14] provide a good overview of the range of factors usually included in seeking to explain firm level TFP or labour productivity – and what we might be missing:

> "Capital services that are often accounted for in these calculations include tangible capital services such as machinery and equipment, but there is a slew of other capital assets that might also be included. … Capital assets that are often "missing" from TFP calculations include natural, social, intangible and human capital,"
>
> (Martin and Riley, p.5).

Management scholars would extend this list of missing factors to include related organisational or intangible factors such as the quality of management and leadership, training, innovation, work organisation, workplace well-being and, increasingly, digitalisation.

Reviewing the evidence on the drivers of UK productivity, NIESR (2022)[5] considers this long list of productivity drivers, alongside more structural explanations. Driffield et al. (2021),[15] however, argue that the balance of influence of structural and more intangible factors on productivity is changing rapidly. Their analysis of OECD firms across all regions and sectors suggested the decreasing importance of structural factors (size, location, sector and ownership) to firm productivity, and the growing contribution of organisational and intangible factors (among other things) to increasing productivity differentials.

Younger firms

For example, it is often argued that smaller and younger firms face specific barriers to borrowing related to risk, asymmetric information and a lack of collateral, which may be limiting their ability to make productivity enhancing investments.[16]

Notably, Motta also finds that lower productivity SMEs are most likely to be rejected when seeking external finance. UK SMEs may also have been disproportionately impacted by economic instability. For example Martin Sartorius, giving evidence to the TPI productivity commission, emphasised stability and policy certainty as key to making investment decisions:

> "Looking internationally, the UK has been going through kind of quite a volatile period over the last six years or so. And that does stand out from other international peer countries. And it comes up all the time when we kind of speak with businesses."
>
> (NIESR 2023, p. 13).

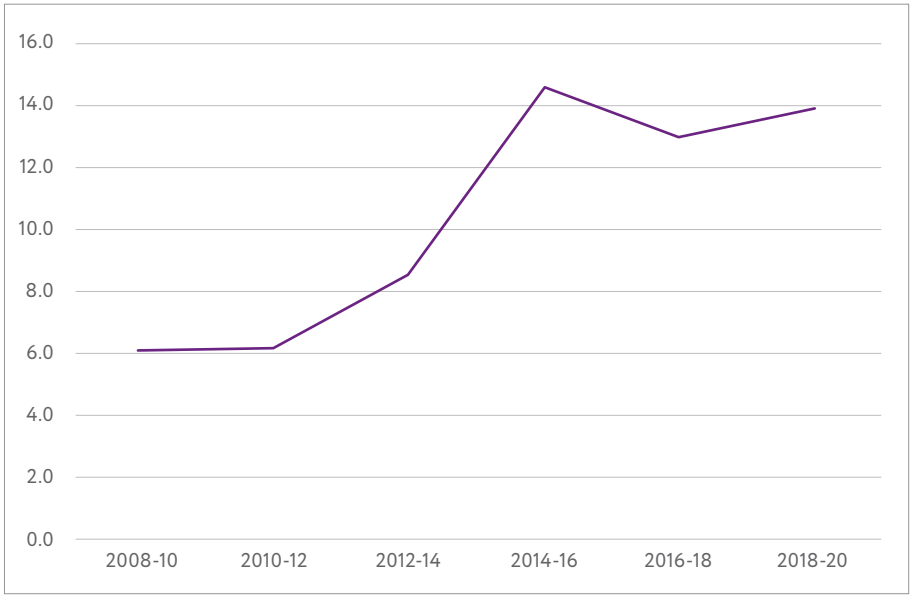
This type of effect seems likely to have intensified during the recent surge in costs for businesses, and weaknesses in SME investment (both in tangible and intangible capital) continue to be linked to concentrations of lower productivity in firms and regions. Jordan and Turner (2021),[18] for example, discussing the persistent productivity deficit in Northern Ireland, identify persistent under-investment in R&D as a key issue for that region.

More generally, the increasing divergence in terms of productivity is also reflected in other, related firm-level metrics. For example, over recent years although levels of innovative activity have varied among UK firms (see Figure 2a), the gap between the proportion of large firms and SMEs engaging in innovation across the UK has increased consistently.

Figure 2: Percentage of UK firms which are 'innovation active'.

A: % of businesses which are innovation active

B: Difference in % of innovation active firms (large firms less SMEs)



Source: UK Innovation Survey. Innovation active firms are those engaged in some aspect of innovative activity undertaking R&D or any form of product, process or business model innovation.

Lack of diffusion

While the growing gap between innovation by large and small or medium firms could reflect changes in the introduction of novel products or services, it might also capture issues related to the lack of diffusion of new technologies, which has been linked to growing productivity differentials (see Chapter Five).[12]

In academic studies, firms' ability to identify and adopt new technologies – known as absorptive capacity - is typically related to skill levels and firms' in-house R&D capacity, both of which may be more limited in SMEs.

It is notable too that in the Global Innovation Index UK firms' knowledge absorption capacity is one of the lowest ranked elements of the UK's profile - ranked 34th overall -compared to the overall rank of 4th for the whole UK innovation system.[19]

Management practices

Another potential contributor to divergence in productivity, supported by strong international evidence, relates to firms' management practices.[20]

Here, small firm size and family ownership are both linked to lower levels of adoption of productivity enhancing management practices.[21] Ownership also proves important, with fewer good management practices adopted by UK-owned than foreign businesses. More granular analysis by ONS suggests that some specific management practices have particularly strong correlations with productivity such as continuous improvement practices, the number of key performance indicators (KPIs) monitored by the business, the performance bonus of non-managers related to targets, promotion practices for managers, and training practices for non-managers.[22]

Productivity drivers at, and behind, the frontier

Bartelsman et al. (2015)[23] consider the drivers of productivity at, and behind, the productivity frontier with a specific focus on human capital and innovation. Using data for large numbers of German and Dutch companies, their results suggest that the productivity benefits of product innovation are – perhaps unsurprisingly – greater in already more productive firms.

Similar to the UK results of Coyle & Mei (2023)[3] and Goodridge and Haskel (2023),[2] sectoral variations are evident in the productivity returns to human capital which are higher closer to the frontier in low technology sectors and lower in high technology sectors. Ownership also proves important in Bartelsman et al., (2015)[23] with firms which were part of a group experiencing higher productivity returns to human capital and innovation.

Firms behind the frontier

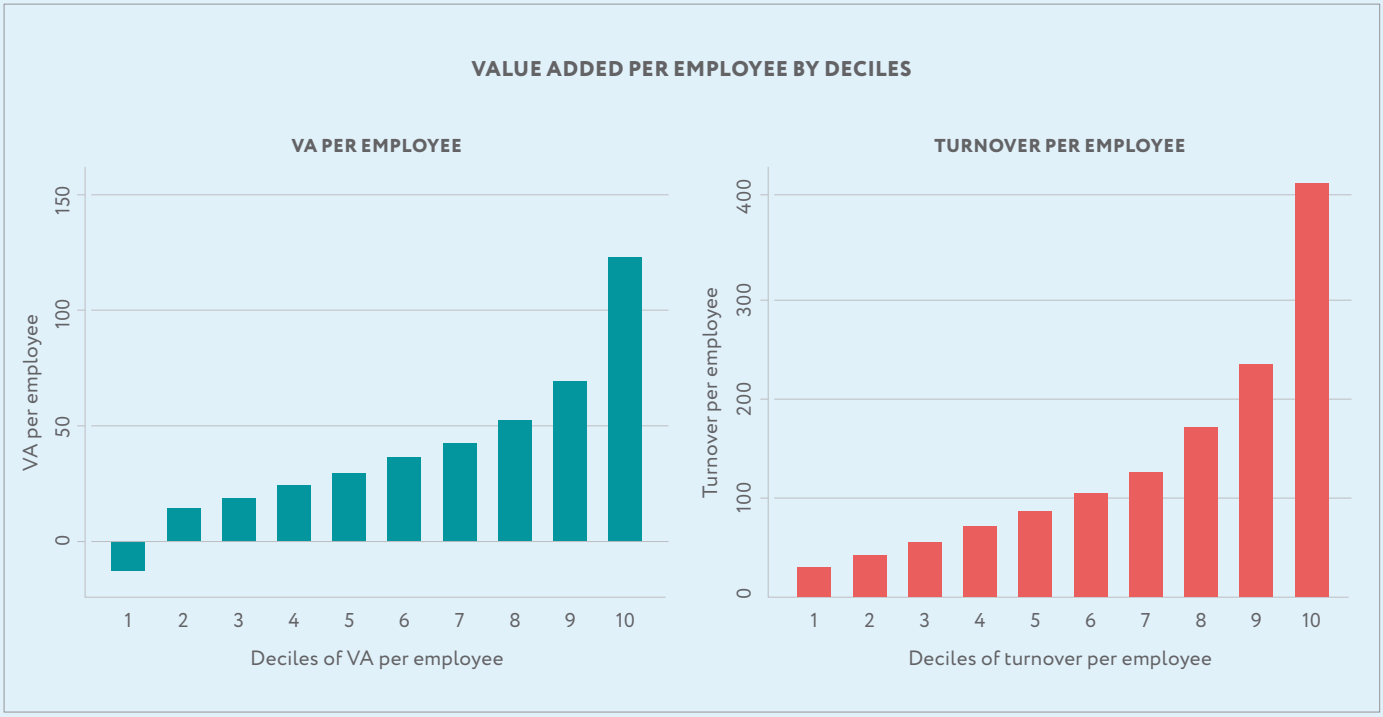
So, what shapes productivity growth in firms behind the frontier? Jibril et al. (2020)[24] examined the drivers of productivity growth among UK SMEs over the 2016-18 period using a combination of quantitative and qualitative methods.

Contrary to previous findings which show that the most productive firms in the economy - frontier firms - grow productivity faster than other firms, for SMEs they find no consistent relationship between firms' initial productivity level and subsequent productivity growth, a pattern which was evident in both manufacturing companies (see, for example, Figure 3).

Moreover, reflecting Driffield et al. (2021)[15] and Bartlesman et al. (2015, Table 6),[23] Jibril et al. (2020)[24] find no strong relationship between productivity growth and the size of the firm, its age, its number of subsidiaries or its fixed investments.

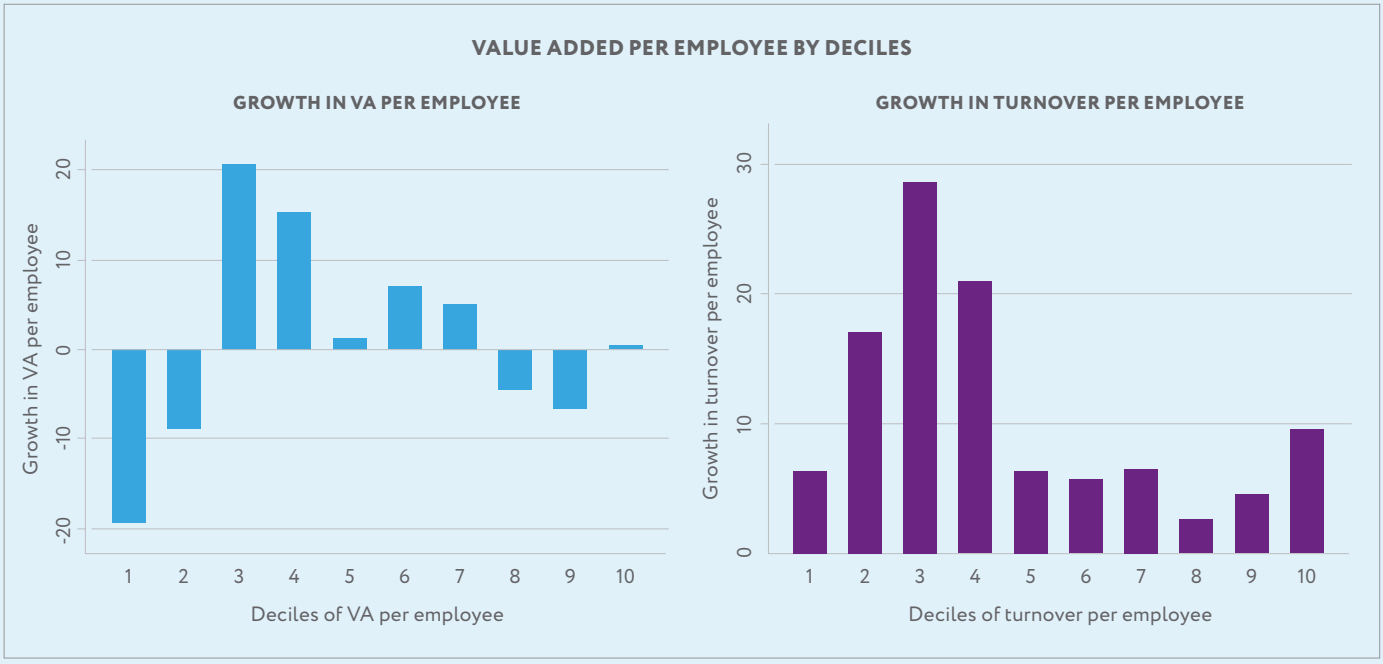
Seeking to understand the results, qualitative analysis suggested a number of factors which characterise high performing SMEs such as inspirational leadership, people management, data-driven operational management processes, strategic investments, and product, market and tactical innovation. Few of these factors are sector specific, although there are variations in how they are implemented.

Figure 3: Productivity levels and growth: Manufacturing sectors



Source: Jibril et al. (2020)

Figure 3 continued: Productivity levels and growth: Manufacturing sectors



Source: Jibril et al. (2020)

Re-thinking 'productivity'

The productivity landscape among UK firms is changing as the performance of previously high-productivity growth sectors weakens, and as productivity differentials between frontier and non-frontier firms grow.

A comprehensive explanation for these patterns remains elusive, and necessarily includes both factors internal to the firm as well as the effects operating through business eco-systems. Moreover, the weight attributable to drivers of productivity may differ markedly between sectors.

ERC (2019),[25] for example, sought firms' views of what determined 'productivity' in six UK sectors, emphasising very different drivers. In the oil and gas sector the oil price was said to play a dominant role in shaping both returns and value added per employee. Other factors highlighted were technology (innovation), management/ leadership skills, regulation, geography and geology.

In the beverages sector competition was seen as a key driver of operational efficiency, while regulation and regulatory changes (e.g. sugar tax, reduction of plastic packaging, deposit return) were seen as raising costs and potentially impacting on margins and productivity.

KPIs

Across each of these sectors, however, and the others included in ERC (2019)[25] - pharmaceuticals, transport equipment, banking and insurance - firms were more focused on industry or firm specific KPIs related to financial returns or operational efficiency rather than 'productivity' as measured by value added.

Increasingly, firms are also seeking to balance financial, operational, environmental and, potentially, pro-social goals. Recent survey evidence, for example, suggests that cost reduction remains most firms' key concern, with 69 per cent of UK SMEs citing this as a priority. For around half of SMEs, the 'introduction of new products or services' and 'reducing environmental impact' was also a business priority.[26] Just under one in four UK SMEs said that "generating social and community benefits for people" was a priority for the business in 2022.

Policy implications

Improving levels of innovation, and the adoption of new technologies and management best practices, by UK firms operating 'behind the frontier' provides a focus for policy intervention to support long-term productivity growth. This will require a shift in policy thinking, however, as much current policy focuses support on leading-edge innovation, most often undertaken by frontier firms (see Chapter Four).

If technology diffusion was working effectively these frontier innovations would then indirectly support productivity growth in non-frontier firms. However, as much of the earlier discussion has suggested, there seem to be significant barriers to widespread best practice adoption among many UK firms, particularly in the important 5th to 9th deciles of the productivity distribution. Improving the knowledge available to these firms through *promoting collaboration, and upgrading their capabilities to innovate and adopt new technologies* is the priority for raising their productivity.

Collaboration

There is strong evidence that promoting collaboration between firms, and between firms and knowledge creators such as universities, can promote both innovation and the wider adoption of new technologies. Such collaborations also provide an opportunity for learning, helping organisations to develop their internal capabilities to innovate and grow their productivity in future.

Direct measures can promote networking and knowledge sharing between co-located firms. For example, supported by the Growth Hubs, the BEIS Peer Networks Programme (which operated from 2020-22) created 'action learning' cohorts of SMEs to provide mutual support for productivity improvements. The earlier CBI 'M' Clubs and the current Knowledge Transfer Networks provide a similar forum for medium-sized companies and those in specific sectors.

Eligibility requirements for public support can also be used to encourage or mandate collaboration. For example, focused on development in the automotive sector, the Advanced Propulsion Centre requires larger firms receiving grant support for their development projects to collaborate with SMEs. This type of requirement could be extended across the UK Research Councils when they provide support to larger or frontier firms. Another well-understood intervention is the 'innovation voucher', which encourages university-SME collaboration.

Local clusters

Another aspect of promoting collaboration relates to the potential for supporting local innovation ecosystems, or clusters. Recent developments such as the Innovation Accelerators and Launchpads seem useful although limited in scale and scope. Giving more weight to localised support for productivity enhancing innovation, particularly where it requires collaboration, may help to address specific local market failures.

Recent evidence suggests both the strong business performance benefits of devolved innovation support,[27] and the strength of local spillovers from investments such as the Catapults.[28]

Investment gaps

As set out in Chapter Two, there are longstanding gaps between *levels of investment* by UK SMEs and their international competitors. These investment gaps apply to training and other intangibles as well as to fixed assets such as equipment. Changing firms' investment practices and priorities may be a long-term project, as Chapter Two documents, but there are well-established and effective mechanisms for *boosting absorptive capacity in the short-term.*

For instance, the Teaching Company Scheme places graduates with firms – many of them SMEs – to undertake business transformation projects, many of which have a productivity focus. Scaling this scheme, perhaps through considering alternative funding models, could both contribute to strengthening university-to-business collaboration and create a step-change in SMEs' capabilities.

Business support

Finally, it is clear that enhancing policy support for collaboration and capability will only be effective if there is widespread awareness and take-up of such support by SMEs. In England the business support framework has become increasingly confusing in recent years, making it difficult for firms to navigate what support is available.

It is a different picture in Scotland, with Scottish Enterprise and Highlands and Islands Enterprise giving local firms a single point of access to the public support network. For Scottish Enterprise firms at least, this system, supported by effective client management, has yielded proven productivity gains.[29] A simpler and more stable policy environment in general would be beneficial for UK firms' productivity, and in particular streamlining multiple support schemes could encourage SMEs to access them.

Key takeaways

In England the business support network has become increasingly confusing. A simpler and more stable policy environment would be beneficial for UK firms' productivity, while streamlining multiple support schemes could encourage SMEs to access them.

Larger firms could receive grant support for development projects in order to collaborate more with SMEs.

Direct measures are needed to promote networking and knowledge sharing between co-located firms.

Give more weight to localised support for productivity enhancing innovation.

Stephen Roper
Professor of Enterprise,
Warwick Business School

stephen.roper@wbs.ac.uk

"The productivity disparities between the best firms and the rest have widened in recent years. Other studies have also suggested marked – and perhaps unexpected – differences in sectoral productivity trajectories in the UK."

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