Unpicking the productivity narrative in UK manufacturers

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About PIN

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

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1.0 Introduction

Politicians, economists and commentators are increasingly touting a productivity problem in the UK, when compared to other economies. However, there is very little research exploring productivity from the perspective of manufacturing companies or indeed those who play the most obvious role in generating productivity, namely workers (McCann, 2018). This is a major gap in our knowledge. The authors of this report, as researchers who spend considerable time in manufacturing organisations, started to question whether what they were hearing in the media about UK productivity tied up with the conversations they were hearing from people within UK manufacturing. They started to ask fundamental questions such as: Is productivity being talked about in boardrooms, and factory floors in UK companies? Do employees understand what productivity means and how they might affect it? This PIN Pioneer Project set out to address these questions and better understand the productivity narrative in manufacturing organisations, looking particularly at the aerospace, automotive, food & drink and pharmaceutical sectors. This report begins by providing the context and rationale for the project (Section 2) and an overview of the project activities (Section 3), before the findings are presented (Section 4) and discussed (Section 5). Finally conclusions and implications are drawn (Section 6).

2.0 Rationale for the study

In the UK, our poor productivity performance, particularly compared to other economies, has become a popular subject for politicians, economists and commentators. The lack of improved productivity growth is perceived as problematic (CBI, 2016; EEF, 2016; IoD, 2018; McCann, 2018). We are all hearing this news reported in the media but what do these headlines actually mean to the everyday worker, and do people working within manufacturing companies in the UK actually see a link to their own organisations and their own activities? Is there a way to better align the conversations we are having in business with the national goal of improving productivity? Whilst there is little work on manufacturing productivity in the academic literature, in the past few years there have been a number of reports from professional bodies such as the CBI, the Institute of Directors (IoD) and EEF (now Make UK). The CBI (2016) explored influences on the UK's productivity success in their report "Unlocking Regional Growth" and the EEF (2016, 2018a, 2018b) has produced a number of reports highlighting key issues for UK manufacturing including the factors influencing productivity success. EEF contributed one of the most relevant studies for this project, "Productivity: the state of the manufacturing nation." This highlighted that productivity growth in manufacturing outperformed that of services and the whole economy in the two decades to 2014, and suggested that manufacturing may not be the source of the UK's weak performance (EEF, 2016:3). The report also suggested that "manufacturing has the potential to be a major driving force behind improving the productivity performance of the UK economy" and that "the sector will get further if government and businesses are talking the same language about productivity." Whilst positive about manufacturing, the report also suggested that manufacturers needed to focus more on improving the productivity of the company as a whole, rather than just in the factory, and on adopting major advances in technology. The EEF report concludes that too much focus on a macro-economic view of productivity means we "could be missing a trick" and suggesting that it is important to "dig deeper" and look at different sectors and the businesses themselves.

The importance of focusing on the micro level was echoed by the CIPD (2018:15) in their Labour Market Outlook. This highlighted that the headline media productivity figures are often derived from "official statistics" and aggregate data "from the whole economy, representing outputs as disparate as cars, haircuts, and public services", observing that "it is no wonder that this abstract macroeconomic concept may feel distant from the everyday practice of employers". CIPD also asked their members if the term productivity was used when discussing performance and half agreed they did. However, there were notable differences by sector. For example, 71% of manufacturing companies used the term compared to 18% of education employers and 16% in the voluntary sector. CIPD (2019:16) suggested that this discrepancy might come from the fact that "measurement is much easier in some industries than others. It is much easier to measure the value of a car that is openly traded in the market than a teacher's lesson." In a similar investigation, the IoD (2018:9) reported, "60% of IoD SME members do not formally monitor productivity in their organisation". IoD suggest that many small business leaders prefer to frame productivity as "working smarter" but opt to focus their measurement on other measures such as profit and revenue. The IoD suggests "supporting businesses to understand and monitor their productivity" and a better understanding of what productivity is, what it means for performance, and how it can be monitored in order to promote a "productivity mind set" in SMEs. A similar call for better understanding and common language has been made by Be the Business (2018).

There is therefore a clear gap in understanding around the narratives of productivity within companies. There is also a call to arms that says that only by speaking a common language can we drive real improvements in productivity that the UK wants to see. Until we get the companies, the executive teams, the managers and the workers engaged in the conversation around productivity, then we will not bring about step change. Finally, it is also evident that clear and improved measurement and monitoring of productivity at the company level could help address this national concern. The thinking being that a strategic aim (in this case improving UK national productivity) is more likely to be achieved if we can create alignment of those involved in the system. Given this context, the focus of our study was on exploring how, if at all, productivity was being discussed within UK manufacturing companies and how this can be used to inform and better align the macro (Government) and micro (company) perspectives.

3.0 Project overview and approach

The aim of the project was to move the productivity conversation forward, away from the economists, politicians and statisticians, and into the workplace by engaging with employees in manufacturing companies. The project was undertaken between September 2018 and July 2019 and funded as a Pioneer Project by the UK's Economic and Social Research Council (ESRC) through the Productivity Insights Network Programme (Reference ES/R007810/1). The overall aim of the project was to understand productivity from a different perspective by discovering what productivity conversations were actually taking place inside UK manufacturing companies, if at all. In so doing, the project contributes to addressing the gap in understanding, highlighted by Boys (2019), who advocates the need to "continue research into firms' attitudes and awareness of the issue."

The main project objectives were as follows:

1. To understand how productivity is perceived by UK manufacturers.

2. To explore variances in narratives within and across companies and sectors.
3. To identify how companies are measuring productivity.
4. To identify productivity drivers, constraints and enablers.
5. To explore whether there is a perceived productivity problem.

The project was undertaken from September 2018 to July 2019 and involved a review of sector and company-related secondary data, as well as the wider literature on productivity, plus 40 interviews with Directors, Managers and Supervisors across 19 manufacturing companies involved in aerospace, food and drink, pharmaceutical or automotive (sectors highlighted by EEF 2018). The selected companies included some High Value Manufacture (who compete on factors other than price) in the expectation that they might fare better in terms of productivity. Semi-structured interviews were undertaken with purposefully selected employees based on company and personnel-related criteria. The interviews lasted between 30-90 minutes and were undertaken in person and by telephone/Skype. Various engagement activities were undertaken with industry and the public sector to raise awareness about the project, share knowledge and verify the outputs. These included company briefings, media coverage via social media, newsletter articles, a press release, the PIN blog and presentations to industry support organisations as well as academic conferences (further information about the engagement activities is provided in Appendix 1).

4.0 Findings

The findings provide empirical evidence about how productivity is understood within some UK manufacturing companies. A summary of the findings, relative to the objectives noted in section 3.0, is provided in this section and reveal a more complex picture than high-level statistics would indicate.

4.1   The perception of productivity in UK manufacturers

The majority of interviewees stated that the term productivity was used in their company and considered important, with a number of interviewees even having productivity in their job title. However, usage was not universal and there were companies where productivity was not referred to (or it had only recently been introduced), including interviewees who initially stated that it was used and the realised that this was not so, as the interview progressed. The definitions of productivity were diverse and the interviewees themselves commented on the high level of variability in terminology within companies, across different departments, sites and personnel, and between companies and Government (see Table 1).

Table 1: Evidence of variance in the perception of productivity

Variation level	Quotations from interviewees
Between Government and companies	*"It is nothing to do with how the Government looks at productivity in GDP terms"*
Between sites within the same parent organisation	*"there are variations across sites…not a standard"*
Between departments on the same site	*"As it goes through the organization, it is translated into an appropriate language for the audience"* *"they [shop floor] might not know productivity off the cuff… but they would be able to show you where it is measured… how it is tracked"*

4.2. Key productivity narratives

We wanted to understand if there were different "narratives" around productivity and if there were clusters around sectors or across levels in organisations. Throughout our interviews we found that productivity definitions can sometimes get entwined with narratives about efficiency, effectiveness, measurement and company and site-specific terminology. As a research team we analysed all the interviews looking for clusters and our analysis suggests four key narratives, which are discussed in turn below.

(i)   *Efficiency focus.* The most dominant narrative across the sectors was around efficiency, utilisation of assets and in particular reducing inputs and waste. This is consistent with evidence from the academic literature (for example, Smart et al., 2017; Mankins, 2017). There was also more of a focus on reducing the inputs involved in production rather than looking at the wider business.

(ii)   *Volume/output.* A large number of interviewees associated productivity with the volume of output, for example crates per hour, cars per week, tonnes per day. This was particularly prevalent in global businesses where comparisons were often made between different sites and reference made to internal competition.

(iii)   *Meeting the plan.* There was a significant group of interviewees who associated productivity with hitting the plan, target, or forecast. This was closely linked to a focus on output, but with a different emphasis. There were examples of this across all the sectors, for example within aerospace it was common to refer to more traditional work study approaches where, in the product/process design phase, they worked out how long tasks should take and then used this to measure standard times and deviations from plan.

(iv)   *Focus on output and value.* This narrative had at its core, a focus on the importance of increasing output and value. These interviewees tended to be more strategic and interested in value increases. Examples included a company in the pharmaceutical sector that talked about the measures they were taking to increase yield in a process,

and a food and drink manufacturer who turned down supermarket own brand work in favour of their own high- value brand resulting in lower volume but higher margins.

Disappointingly, the prevalent focus across the narratives was on efficiency and meeting the plan and volume, rather than adding value. Mankins (2017) suggests that over the past 20 years the focus within companies has been largely on efficiency, which has brought significant benefits to many companies in different economic times. However, he suggests that going forward, we need to move the conversation to one around productivity. Our findings highlight a high level of instances where efficiency and productivity are confused. This has worrying implications for longer-term sustainability of manufacturing operations, including the locational stickiness of larger, foreign-owned companies. ,

4.3 Productivity related measures

There was no single measure of productivity being used in the companies we interviewed. Multiple measures were more common, in line with what we found in the literature (for example, EEF, 2016; CIPD, 2019). Some companies tracked aggregated measures at a high level, such as turnover per employee, but often the conversation was more about the manufacturing shop floor where it will be measured using multiple metrics such as OEE, output per line, machine utilisation, on-time delivery and standard work. Often productivity was measured against a target, standard or benchmark and there were a few examples where internal competition with other plants, was seen to drive particular behaviour. Productivity was often synonymous with metrics and measurability, resulting in a focus on activities that can be measured. This may have been skewed the operations-focused positions of our interviewees, although this finding does reflect that of the IoD (2018). Finally, there was a tendency for companies to focus attention more on problem areas where things were not operating as expected, rather than on opportunities for adding value. Most of the visual management boards we saw in manufacturing plants focused on problem areas. This is perhaps to be expected, given the use of approaches such as lean, six sigma and the Toyota production system, but such a focus could encourage a myopic perspective in the company.

4.4. Influences on productivity

There was a lot of agreement across the interviewees when talking about the factors that enabled and constrained productivity. Product and process design, the planning process, productivity culture, and good management were found to have a positive impact on productivity. On the other hand, slow legacy systems, large company size, many regulations about health and safety, slow changing organisations, customers changing requirements, waste within processes and bureaucracy were identified as constraints of productivity. The most common factors discussed by interviewees were as follows:

(i) *Managerial practices* were found to be mainly an enabler of productivity under specific conditions: proactive senior management, leadership with access to the shop floor, leadership motivating staff, recognition of achievements, trust between management and staff, and alignment of managerial hierarchies. Innovative and well-trained management can impact staff happiness and make them more productive. However, managerial practice can have negative implications on productivity due to slow

decision-making, complex judgement due to varying requirements for customer satisfaction, management not exhibiting the behaviour they talk about, and senior staff not willing to accept new practices.

(ii) *Information technology* was found to have both positive and negative effects on productivity. The positive effects were linked to the use of ERP systems, investments in automation, digital technology for data analysis and management, innovation, new layouts, materials, and machine tools. The negative effects of information technology were found to be related to the legacy systems with old software, uncertainty and difficult to monitor, union protests for job losses, culture change, cash release to invest in new technologies, and automation.

(iii) *Product innovation* was found to be an enabler of productivity. Some examples of how product innovations can be achieved as given by the interviewees include encouraging people to come forward with ideas, allowing free thinking, being flexible in product refining based on customer needs, and diversifying product portfolio in collaboration with suppliers. Having effective product design processes was also seen as a positive, for example having stage gate approaches and design for assembly. Some even talked about design for productivity being the key.

(iv) *Higher quality of capital inputs* was found to have a significant effect on productivity. Investing in new equipment, partnering with suppliers to benefit from sharing resources and equipment, and effective utilisation of inputs were found to impact positively productivity. Old machinery and tooling can also lead to lower quality of inputs with the following factors emerging from the interview analysis: lack of appropriate machinery and tooling, non-availability of parts/ tools, aging machinery, trade-off when buying tooling.

(v) *Suppliers* could also have positive and negative impacts of productivity. A number of companies talked about good supply chain management being crucial for productivity. Inflexible suppliers, problems with supply and complex business relationships (for example, where the customer might also be a supplier) were seen as problems for productivity.

(vi) *Higher quality labour inputs* were also found to enable productivity. Based on the interviewees the main factors that lead to higher quality labour inputs are skilled machinists, having apprenticeship schemes for bringing in new talent, staff bonuses, workforce motivation through recognition, good leadership, clear employee objectives, staff training, and keeping employees healthy. There are also factors that can hinder productivity with interviewees referring to factors such as: reliance on aging demographic, experience loss due to retirement and new employees, experienced staff not interested in training, resistance to change. Absenteeism and engagement was also seen as problematic in some organisations.

(vii) *Regulation* came up in a number of interviews. Whilst most people recognised the imporance of health and safety, on a number of occassions interviewees talked about taking it too far having a negative impact on productivity. In the pharmaceutical industry

problems of regulation were particularly marked. Not only did they talk about the problems of getting accreditation, but they also talked about this being a barrier to innovation and change.

Comparing this to previous work, the findings confirm some of the factors suggested by EEF (2016; 2018a; 2018b) such as ownership, company size, management practices, capital investment, and labour use.

4.5 Productivity as a problem

Just over a quarter of the interviewees mentioned that a productivity problem existed either at the level of the company or the UK, while 5 others were unsure stating, that it was sector-dependent and/or market related. At the company level, problems related to the challenges presented by automation and technology, skills (both management/leadership and workforce), company culture (including factors such as motivation/encouragement, work ethic), workforce engagement, company structural changes (particularly ownership and multiple site relationships) and rising costs including wages.

UK-related productivity problems focused on rising costs, remaining competitive, retaining manufacturing capabilities, workplace culture (including resistance to change, work ethic and reluctance to fire) with some sectors being perceived as more likely to have problems than others. Interviewees did however identify a number of future productivity challenges for their companies and the UK. Company-related issues included process improvement problems (such as planning, rework, design/production integration and costs), technology (particularly harnessing new opportunities around automation, digitalisation and data analytics) and people. The latter was the most regularly referenced by interviewees, often highlighting a knowledge gap within companies, as a result of an aging/departing workplace, difficulties in engaging the workforce, and the issues with recruiting and developing new staff. External factors mentioned were competition and the comparative cost of manufacturing in the UK, as well as clarity from Government around productivity and manufacturing terminology. The support requirements mentioned related to skills development (both for new entrants and existing staff), funding for equipment and technology, incentives for a longer-term focus and a supportive regulatory environment. Some interviewees mentioned access to research centres and universities as a positive, with examples of collaborative activity. However, others suggested a disconnect between companies and academia.

5.0 Discussion

We set out to understand the narratives around productivity within UK manufacturing companies. Consistent with our expectations, our primary research found that productivity means different things to different people within manufacturing. Whilst earlier surveys from IoD and CIPD asked people if productivity was talked about in their organization, our more in depth interviews suggest that many people start by saying they talk about productivity but in conversation, it becomes apparent that they might be talking about something else. Productivity is one of these words that, like many others used in business today (e.g. innovation), is so all-encompassing that people don't stop to ask for a precise definition. We saw a number of narratives, some associating productivity with volume of output, others seeing it in light of hitting

targets, plans and forecasts. A few interviewees and companies had realised the importance of increasing the value of outputs in the search for improved productivity. However, in the conversations, "efficiency", cost reduction and waste reduction were regularly mentioned under the heading of "productivity". This is perhaps hardly surprising given that many manufacturers we spoke to have been through process improvement and cost cutting activities in recent years. However, if we are being precise, whilst efficiency and productivity are related, they are not the same and are often confused. Mankins (2017:1) suggests that in the current economic climate it is not enough to focus on shrinking the input (and doing the same with less), arguing, "great companies obsess over productivity, not efficiency". He suggests that focusing on productivity makes organisations think about "doing more with the same" and expanding the numerator rather than just cutting the denominator, and that whilst the focus on efficiency brought significant benefits to many companies in different economic times, going forward we need to move the conversation to being one around productivity.

While productivity was often misunderstood, it was evident that it was regularly associated within the companies with metrics and measurability. Multiple measures of productivity were being used by companies and some were using measures not necessary applicable to the nature of their activities. Reports at the regional and national levels using different measures of productivity (sometimes also down to the availability of data and what can easily be reported) add to the general confusion. For example, when UK productivity is compared to that of other countries, the data used often refers to average contracted hours in the country which, some might argue, bears little resemblance to the actual hours worked by people (Embury-Denis, 2018). A further challenge is that sometimes when "output" is measured, the focus is on volume whilst in other instances, it refers to value. These inconsistencies certainly do not help with a transparent conversation around productivity nor in aligning the macro/micro measurements. Care needs to be taken with measurement and comparability if a beneficial productivity conversation is to be had.

This is also apparent when measurement is applied to different sectors and activities within sectors. Whilst some of the earlier reports talk about certain sectors being more productive than others we would argue that it's not as simple as this. Some economic and policy studies have talked about certain sectors as being more productive than others in the UK. EEF (2018) for example reports that chemicals and pharmaceuticals alongside automotive are amongst the most productive sectors. Obviously manufacturers who have low variety, high volume and who are highly automated (as many pharmaceutical, chemical and automotive companies are) will have economies of scale and might look productive, particularly if you are talking about labour productivity. However, we need to be careful to recognise that companies within sectors can vary hugely, not just in size but also in the nature of their operations. Take for example the pharmaceutical sector in the UK, where there are some companies with large manufacturing sites and almost continuous manufacturing, which, unsurprisingly look highly productive with high volumes, low variety, high levels of automation and low staffing levels. Whereas in other parts of the sector, there are companies who are engaged in substantial development work that needs significant investment, is subject to high levels of regulation and generates little or no return in the short term. Measurement issues are also apparent in relation to the changing nature of manufacturing in the UK. The move by UK manufacturers towards High Value Manufacturing (HVM) where companies compete on the basis of innovation, quality and brand, changes the nature of the operation and can often lead to lower volume production but higher

margins. Companies operating in HVM, where there is significant design and customisation and lower volumes, would not look very productive if measured in terms of volume. However, assuming such HVM companies are charging premium prices for their products (and the market can bear it), and productivity is measuring output in value rather than units, those companies could be perceived as highly productive. Arguably, a HVM company has more opportunity to manipulate the numerator if output is measured in terms of value, whereas a company that is operating more at the commodity side of things has less scope to manipulate the output in value and will naturally focus on efficiency and reducing inputs. There is also a wider issue of using labour productivity as a measure when looking at "the new economy" where apps and algorithms are adding value with very little direct labour.

The economists might argue that "productivity isn't everything, but, in the long run, it is almost everything" (Krugman, 1994). However, what we would not want to see is companies becoming too focused on productivity (or the wrong aspects of it) at the expense of looking to the longer term and investing in the future. Recent UK manufacturing losses, such as the Michelin tyre factory in Dundee and the Honda factory in Swindon, were both perceived as highly productive operations, but the decision to close these factories was influenced more by market conditions and company strategy than productivity performance.

We also wanted to understand the factors affecting productivity. Speaking to people within manufacturing organisations exposes a greater richness of the challenges and complexities. There was a lot of agreement across the interviewees when talking about the factors that enabled and constrained productivity. Product and process design, the planning process, productivity culture, and good management were found to have a positive impact on productivity. On the other hand, slow legacy systems, large company size, many regulations about health and safety, slow changing organisations, customers changing requirements, waste within processes and bureaucracy were identified as constraints of productivity. Whilst interventions and support can help address some of these (for example management skills and planning processes), others are less easy to address. Indeed, when asked what support could help improve their own company's productivity, the majority of interviewees did not specify particular support needs, possibly because they could see no easy "fix". Those that did, focused on support for skills development, both in terms of bringing new skills in (e.g. apprenticeships) and in-house development of existing staff (e.g. courses, coaching), funding for capital spending particularly in relation to technology developments, and incentives for longer-term focus from management. The need for a supportive regulatory environment that provides more stability and encourages longer-term investment, were also mentioned. Some interviewees were working with universities and research centres in a positive way to support their activities, although others felt that there was a disconnect between the two. This could be an area worthy of further investigation.

Finally, only around a quarter of the people we interviewed felt that the UK had a productivity problem, with a handful stating that this was sector or market specific. UK-related productivity problems focused on rising costs, remaining competitive, retaining manufacturing capabilities, workplace culture (including resistance to change, work ethic and reluctance to fire) with some sectors being perceived as more likely to have problems than others. At the level of the company, the perceived productivity "problems" mentioned related to the challenges presented by automation and technology, skills (both management/leadership and workforce), company

culture (including factors such as motivation/encouragement, work ethic), workforce engagement, company structural changes (particularly ownership and multiple site relationships) and rising costs including wages. Again we can see evidence of some of these being addressed by the government, for example through the Industrial Strategy and through regional and sector support. However, issues around ownership, company structure and culture are less easy to address through intervention.

6.0 Conclusion

The findings contribute to the productivity puzzle debate by providing a much-needed empirical and company-level perspective about how productivity is perceived, discussed and experienced within manufacturing. The study has provided evidence from employees within manufacturing companies, rather than only at a sector level, about the productivity narratives taking place (or not) within companies. This reveals a more complex picture than high-level statistics would indicate. The key conclusions drawn from this project are as follows:

(i)   *There is a high level of variance about the definition of productivity*. This is apparent within and across companies, and there a disconnect between the micro (company) and macro (Government and economists) levels relative to perception and measurement of productivity. Not all of the companies used the term productivity, and for those that did, there was no consensus around definition. At the most basic level this study has demonstrated that the narratives around productivity with in manufacturing companies are not necessarily recognisable to the narratives of the economists and politicians. And it is fair to say that the productivity headlines in the media did not resonate with many of the people we interviewed.

(ii)   *Diverse measures are used by companies to assess productivity* and the latter is extensively linked to metrics. This can result in a focus on activities that can be measured rather than wider activities within the company. This suggests issues for performance measurement and comparisons, and that a focus on productivity at the macro level was not seen to help at the company or individual level. At the outset the researchers may have thought there was an exercise to be done in aligning the conversations at the company level with the government's aim of improving productivity. But having completed the study we realise it is not that simple! Whilst addressing the issues around language and definitions is to be encouraged, over-focus on productivity at the level of the company could be dangerous.

(iii)   *Four productivity-related narratives are apparent*: (i) volume and output, (ii) meeting predetermined targets, (iii) efficiency and cost savings or (iv) increasing output and value. The research has shown us that at a company level, the majority of manufacturers we spoke to were working at improving processes, reducing waste and cutting costs. But we were disappointed at the lack of focus on innovation and effectiveness.

(iv)   *There are a number of commonalities across companies about the factors that constrain and enable productivity.* These include such as company structure,

management, information technology, product innovation, capital inputs and labor inputs, with many found to be both constraints and enablers.

(v)   *Future productivity challenges and support requirements are identified.* For companies, process improvement issues (such as planning, rework, design/production integration and costs), technology (particularly harnessing new opportunities around automation, digitalisation and data analytics) and people are key. The latter was the most regularly referenced by interviewees, often highlighting a knowledge gap within companies, as a result of an aging/departing workplace, difficulties in engaging the workforce, and the issues with recruiting and developing new staff. External issues affecting the company were competition, the comparative cost of UK manufacturing and clarity from Government around productivity and manufacturing terminology. Support requirements related to skills development (both for new entrants and existing staff), funding for equipment and technology, incentives for a longer-term focus and a supportive regulatory environment.

(vi)   *The perception of a productivity problem is not widespread among interviewees.* The issue was mentioned by just over a quarter of the interviewees, and mainly at the company level. The companies' challenges are reflected in this (automation and technology, skills access and development, company culture, workforce engagement, rising costs and company structural changes particularly ownership and multiple site relationships), whilst at the UK-level, perceived problems relate to rising costs, competition, retaining manufacturing capabilities, and workplace culture.

For policy makers, the study findings highlight the importance of encouraging an innovation focus on for a sustainable long-term future and to ensure that a focus on productivity drives a company's competitiveness. Issues around consistency of measures need to be addressed. For industry support organisations, there are opportunities for measuring and benchmarking productivity (perhaps looking at how other countries are encouraging alignment and sense of purpose). And to promote a common productivity language that helps manufacturers and policy makers work towards common goals. Although this does come with a warning the productivity may not be the most important thing for companies to focus on given the changing face of manufacturing strategies and operations in the UK. For policy makers, there are opportunities to encourage an innovation focus for a sustainable long-term future and ensure that a productivity-focus drives a company's competitiveness. For industry support organisations, there are possibilities to define new formula for measuring productivity; seek measurement alignment to improve productivity; and to promote a common productivity definition that helps manufacturers to assess/drive progress and Government to better understand/promote company and industry performance. Finally, for academics, there is the opportunity to Investigate how to: promote a common understanding and language; create new ways of measuring and creating alignment; encourage a focus on innovation and value- added for the long term; and question the appropriateness of labour productivity in the new economy.

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Appendix 1: Engagement activities undertaken in the project

Engagement activity	Detail	Date
Project profile on PIN website	Title: "Productivity – what do UK manufacturers really think?"	December 2018
Project blog on PIN website	Title: "Productivity: It isn't just what economists say it is …"	March 2019
Project profile in PIN Conference brochure	Title: "Exploring the productivity narrative in manufacturing organisations."	March 2019
Article in Engineering News, the newsletter of the Faculty of Engineering, University of Strathclyde, Glasgow.	Title: "Productivity – what do UK manufacturers really think?"	January 2019
Press release via University of Strathclyde website and Scottish media.	Title: "Pioneering research explores industry view of productivity."	March 2019
Presentation at event hosted by The University of Strathclyde and Productivity through People, Glasgow: "Addressing Scotland's Productivity Challenge."	Title: "Unpicking the productivity narrative: what does productivity mean to different people?"	April 2019
Participation in round-table discussion event at The Industry Strategy Council, London.	Short presentation and discussion.	April 2019
Presentation at event hosted by the Institute of Engineering and Technology (IET), Design and Production Sector meeting, London.	Title: "Unpicking the productivity narrative: what does productivity mean to UK manufacturers?"	May 2019
Presentation at event hosted by EY and the Scottish Life Sciences Association (SLA), Edinburgh.	Title: "Unpicking the productivity narrative in manufacturing organisations."	June 2019
Conference paper presentation at European Operations Management Association (EurOMA) 2019, Helsinki.	Title: "Unpicking the productivity narrative in manufacturing organisations"	June 2019
Developmental paper presentation at British Academy of Management (BAM) 2019, Birmingham.	Title: "A firm-level analysis of the interaction between productivity antecedents:	Forthcoming (September 2019)
Presentation at event hosted by The Research Centre for Social Sciences: "Good Work: People and Productivity."	Title: "Unpicking the productivity narrative in manufacturing organisations"	July 2019
Discussions with non-academic organisations.	Make UK, Be The Business, Institute of Engineering and Technology, EY, Scottish Life Sciences Association, Scottish Enterprise, Scottish Manufacturing Advisory Service, Scottish Council for Development and Industry.	December 2018 – June 2019