

PAPER IS05

Unlocking SME productivity

Review of recent evidence and implications for the UK's Industrial Strategy

Isabelle Roland

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Abstract

Improving productivity is one of the main goals of the government's Industrial Strategy. Since the UK is a nation of small and medium-sized enterprises (SMEs), the question arises whether SMEs have a role to play in industrial policy. SMEs are vital to the UK economy as employers, but it is far from obvious that as a group they are major contributors to economic growth. This paper reviews recent evidence on two obstacles to growth that SMEs face, namely access to finance and poor management practices, and evaluates the potential for policies to turn the UK's SME population into a growth engine. Access to finance, especially long-term finance, remains a problem for innovating firms with the potential to grow. These are the firms that can drive long-term productivity growth. Therefore, interventions that target firms with higher growth potential are likely to be more efficient than general financial support policy for all SMEs. By contrast, policies that address poor managerial practices have the potential to increase aggregate productivity by targeting all types of SMEs, not just high-growth firms. The paper concludes with a series of policy recommendations.

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Executive Summary

- UK productivity continues to be disappointing. In the first quarter of 2018, GDP per hour stood at 19% below its pre-crisis trend. The UK is a nation of small and medium-sized enterprises (SMEs). SMEs accounted for 99.9% of all private sector businesses at the start of 2017, and 60% of all private sector employment. The question arises whether SMEs can be an engine of growth for the UK as part of the government's Industrial Strategy.
- Despite the crucial role that they play as employers, it is far from obvious that SMEs as a group are major contributors to economic growth. It is fast-growing innovative businesses that can drive long-term productivity growth. Therefore, interventions that target firms with higher growth potential are likely to be more efficient than general business support policy for all SMEs. The challenge for policy-makers resides in identifying high-growth firms. More research is needed on the dynamics of employment and productivity growth across the size and age distribution of UK firms.
- Two obstacles that hamper SME growth are access to finance and poor management practices. Access to finance, especially long-term finance, remains a problem for innovating firms with the potential to grow. A further easing of banking conditions is very unlikely to fill the financing gap as debt is not the right type of financing for risky activities. Risk perceptions by banks have increased significantly since the financial crisis. Research suggests that heightened risk perceptions could account for over half of the 2008-09 productivity fall and around 20% of the gap between actual and trend productivity by the end of 2013. Therefore, the government should aim to develop equity markets, venture capital, and angel investment.
- British firms are poorly managed. Policies that address poor managerial practices have the potential to increase aggregate productivity by targeting all types of SMEs, not just high-growth firms. Research indicates that management practices could account for around 55% of the total factor productivity gap between the UK and the US. Better management practices can increase productivity not only through enhanced operational efficiency and the adoption of existing and new technologies, but also by affecting a range of corporate policies, including how financially constrained firms save in order to take up future investment opportunities.

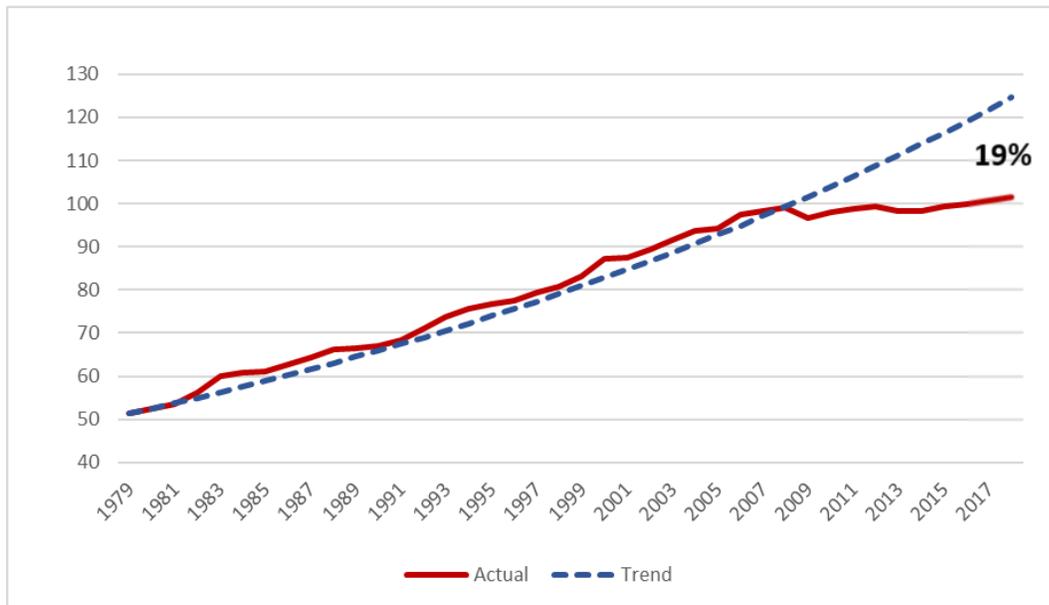
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1. The need for an Industrial Strategy with a focus on SMEs

1.1. UK productivity continues to disappoint

Industrial Strategy has returned to the policy agenda with the government publishing its White Paper “Industrial Strategy: Building a Britain fit for the Future” in November 2017. Since the financial crisis, a key policy priority has been to improve the UK’s productivity performance. The UK has experienced a slump in productivity growth since the crisis. In the first quarter of 2018, GDP per hour stood at 19% below its pre-crisis trend between the first quarter of 1979 and the second quarter of 2008 (see Figure 1).

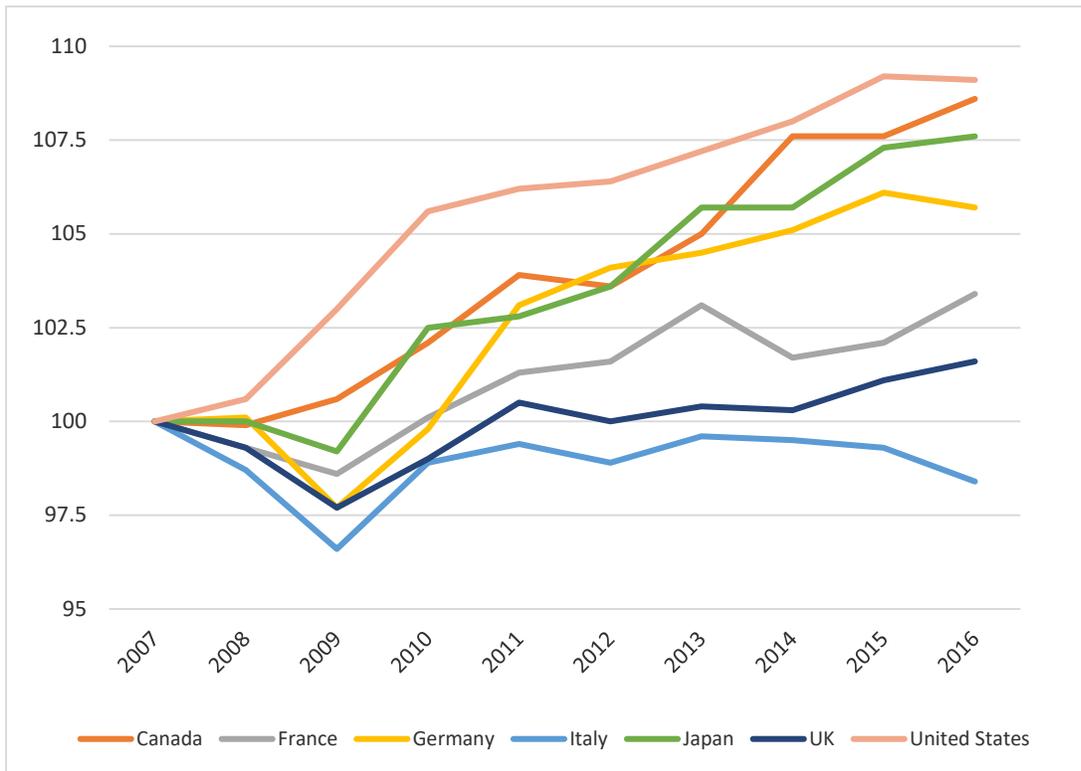
FIGURE 1: Whole economy GDP per hour, 1979Q1 – 2015Q4 (2008Q2 = 100)



Notes: Whole Economy GDP per hour, seasonally adjusted (Q2 2008 =100). ONS Statistical Bulletin, Labour Productivity, Q1 2018. Predicted value after 2008Q2 is given by the dashed line assuming a historical average growth of 2.3% per annum (the average over the period Q1 1979 Q1 to Q2 2008).

The UK’s poor productivity performance stands out in an international comparison. Labour productivity growth has slowed in both the UK and the rest of the G7 over the past decade, but the slowdown appears to have been larger in the UK. Figure 2 shows the difference in productivity trajectories since 2007 for the G7 economies. Output per hour fell in most G7 countries during the downturn in 2008-2009, before rebounding sharply in Canada and the US. The UK ranks second bottom, just above Italy, in terms of average productivity growth since 2007.

FIGURE 2: Constant price GDP per hour, G7 countries



Notes: Constant price gross domestic product per hour worked, 2007=100. Source: ONS Statistical bulletin: International comparisons of UK productivity (ICP), final estimates: 2016

1.2. Can SMEs be an engine of growth for the UK?

This “productivity puzzle” has stimulated a lively debate among academics, the media and policy-makers, and small and medium sized enterprises (SMEs) have moved to the forefront of the policy agenda. This is accompanied by a debate about their importance for economic growth. The UK is a nation of SMEs (firms with 0-249 employees). SMEs accounted for 99.9% of all private sector businesses at the start of 2017, and 60% of all private sector employment (ONS, 2017a). SMEs collectively accounted for 73% of all net private sector job creation in the UK between 2010 and 2017 (Nesta, 2017). However, despite the crucial role that they play as employers, it is far from obvious that SMEs as a group are major contributors to economic growth. This is because many SMEs are focused on remaining in business and have no intention to grow, let alone to become national champions. According to the latest UK Innovation Survey (BEIS, 2018), only 49% of SMEs were engaged in innovating activities in 2014-16. It is clear that interventions that target high-growth firms (HGFs) are likely to be more efficient than general business support policy for all SMEs.

One dimension of the debate surrounding SMEs is whether it is small versus young firms that contribute the most to job creation and destruction (see e.g. Haltiwanger et al., 2013). The answer to this question matters because job turnover is a reflection of business dynamism, whereby labour

is reallocated to its most productive uses.² Recent OECD work (Criscuolo et al., 2014) shows that young SMEs (no more than five years old) have been the most dynamic job creators over most of the past decade in a sample of 18 countries. In the UK, young SMEs accounted for an average of only 13.7% of total employment in 2001-11, but created around 36.4% of jobs. However, while young firms contribute disproportionately to gross job creation, they have low survival rates (so called “up-or-out” dynamics). Overall, the literature suggests that size and age alone are not sufficient indicators to identify high-growth firms (HGFs). Many start-ups do not survive, and many small firms remain small for long periods of time (Nesta, 2009; Criscuolo et al., 2014). According to Criscuolo et al. (2014), very few UK micro start-ups (0-9 employees) grow above 10 employees after three years (about 3% in 2007).

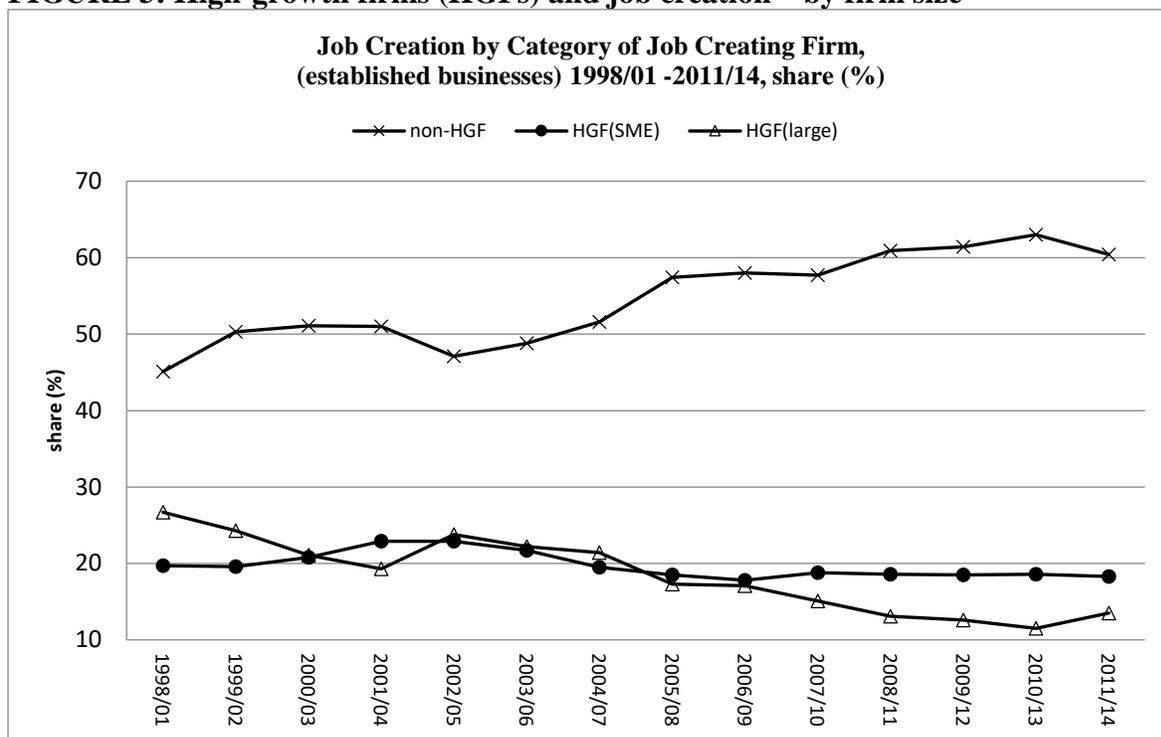
The literature on HGFs provides useful guidance for identifying firms with high growth potential. There are a small number of high-growth firms³ (HGFs) which contribute disproportionately to growth and job creation in the UK. According to Hart and Roper (2018), there were around 11,000 HGFs in the UK for the period 2014-2017, representing 6.3% of all UK firms employing ten or more people. This small group of firms, whether start-ups scaling up or more established businesses growing rapidly, had a disproportionate impact on job creation. Therefore, they have come to be known as “The Vital 6%” (Nesta, 2009).⁴ This literature confirms that not all HGFs are young firms or SMEs. The majority of high-growth firms (HGFs) are at least five years old (70 per cent). Nevertheless, young firms are more likely to be high-growth, and young HGFs are responsible for a fifth of the jobs created by HGFs (Nesta, 2009). According to Anyadike-Danes and Hart (2015), SME HGFs represent less than 1% of established businesses. However, their long-term average contribution to job creation has been very stable at around 20% since 1998/01. By contrast, the share of larger HGFs in job creation has shown a ten-percentage point decline over the same period (see Figure 3).

² Hijzen et al. (2010) show that job reallocation through the entry of new firms which are more productive than the average incumbent and the exit of less productive firms contributed more than half of the growth of UK labour productivity for the period 1997-2008. The authors also find a decline in total job turnover (job creation and destruction) during the sample period, particularly since 2002.

³ Defined here as firms with more than 10 employees, which are at least three years old, and have achieved average growth of either sales or employment of 20 per cent per annum for the last three years (a common definition used in policy discussions).

⁴ Nesta (2009) finds that HGFs generated around half of the new jobs created by existing businesses in the UK between 2002 and 2008.

FIGURE 3: High-growth firms (HGFs) and job creation – by firm size



Source: Anyadike-Danes and Hart (2015).

While it is clear that policy-makers should focus on quality, and not just quantity, identifying firms with growth potential is a substantial challenge. There is considerable debate around the definition of high-growth firms, and the overall picture of their significance for job creation and growth differs depending on the precise definitions and measurement methods used.⁵ This makes it difficult to compare and interpret the results of the existing literature, and more importantly to derive policy recommendations. The dynamics of firm growth are complex, and one must not get fixated on any single definition at the risk of “misclassifying” firms. Since identifying and supporting firms with growth potential is at the heart of the government’s Industrial Strategy, more research is needed in this area. Research-based evidence is needed on job creation and destruction, survival, and, most importantly, the productivity growth contribution of different types of firms, by age and size profile.

There is a long list of factors that constrain SME growth. This paper focusses on access to finance and management practices; both of which have been identified as two important areas for Industrial Policy in the government’s White Paper. Policies that address access to finance and management practices for SMEs are economy-wide – they have the potential to unleash substantial productivity gains by reaching a large fraction of the business population across a wide variety of sectors and in all the UK’s regions.⁶ First, access to finance is a longstanding issue in the UK and has been at the forefront of policy-making since the financial crisis. High-growth firms are significantly more

⁵ See e.g. Anyadike-Danes and Hart (2017) for a novel longitudinal approach over a 15-year period.

⁶ According to Hart and Roper (2018), small high-growth firms are found across the UK. While London dominates, the more peripheral parts of England together with the “Northern Powerhouse” (e.g. Liverpool and Manchester) have above average shares of small high-growth firms.

likely to mention lack of access to long-term finance as an important obstacle than firms with the lowest growth potential (Lee, 2011).⁷ Risky innovation is difficult to fund with internal resources or loans from friends and family. Second, the UK stands out as having poor management practices compared, for example, to the US and Germany. Poor management skills affect all types of SMEs, but according to Lee (2011), high-growth firms perceive the lack of managerial skills as an obstacle disproportionately more than other firms.⁸

2. Access to finance and SME productivity

2.1. UK SMEs and the credit crunch

Credit conditions deteriorated for all types of SMEs following the financial crisis, exacerbating long-standing problems with the provision of finance in the UK.⁹ Since the crisis bank lending to firms, particularly to SMEs, has contracted significantly. Both demand and supply factors played a role in the contraction of lending volumes. However, there is evidence that external finance became harder to get for those firms that sought it. Overdraft rejection rates increased by over 50% in 2009 (compared to 2004) and term loan rejection rates increased by 163%, controlling for changes in credit risk (Fraser, 2012). Loan rejection rates are generally higher for high-risk and smaller firms and those with shorter banking relationships (Fraser, 2009, 2012); reflecting a lack of collateral or a track record of financial accounts. As one would expect, high-growth firms are significantly more likely to mention lack of access to long-term finance as an important obstacle than firms with the lowest growth potential (Lee, 2011). Risky innovation is difficult to fund with internal resources or loans from friends and family, and there are indications that supply-side constraints are more severe for innovating firms. Rejection rates for venture capital (VC) are much higher than for bank or non-bank debt. For example, a UK study published in 2009 found that 46% of respondents approaching VCs had experienced rejection (Cosh et al., 2009). There was also a significant decline in equity finance flows to SMEs (Fraser et al., 2015).

Financing conditions have eased, but remain a problem where it matters most. There was a significant easing in credit availability in recent years. Net bank lending to non-financial corporations turned positive in 2015 (ONS, 2018a). While this is both driven by supply and demand conditions, there is evidence of easing supply conditions. Rejection rates on SME loan and overdraft applications have fallen in recent years and appear low in general (BDRC, 2018). 80% of loan and overdraft applications made in the 18 months to Q42017 resulted in a credit facility being granted, compared to a 68% success rate across 2012-2013. In addition, the market for SME lending has experienced substantial changes since the crisis. Regulatory reforms have led to the emergence of new entrants (challenger banks) that target the SME credit market.¹⁰ In parallel, new sources of finance have emerged. The British Business Bank's 2018 *Small Business*

⁷ 32% of high-growth firms report that obtaining finance is a significant obstacle to their success, compared to only 25% of other firms. 5% of high-growth firms declare that it is the most important obstacle they face (Lee, 2011).

⁸ 41% of high-growth firms perceive managerial skills as a significant obstacle to their success, compared to only 27% of other firms (Lee, 2011).

⁹ See e.g. Kay (2012), and Besley and Van Reenen (2013).

¹⁰ The Bank of England introduced a simplified process with lower capital requirements for setting up banks in 2013. Since then, challenger banks such as Virgin, Metro, and Atom have entered and specifically targeted the SME market.

Finance Markets report reveals welcome evidence that the UK's small businesses are diversifying their sources of finance, and increasingly turning to asset finance and peer-to-peer lending.

However, all firms have not benefited equally from the easing in financing conditions. First-time applicants and innovative firms still report being credit constrained. Rejection rates for first-time applicants remain high: 50% of applications made in the 18 months to Q4 2017 by first-time applicants were rejected. In addition, overdrafts (85%) are more likely to be approved than loans (67%) (BDRC, 2018). According to the most recent data, the availability and cost of finance indeed remain some of the most dominant constraints perceived by firms as a barrier to innovation (BEIS, 2018). Despite the emergence of alternative sources of finance, the four largest UK banks still have a combined market share of 80% for general purpose loans for SMEs (British Business Bank, 2016). In addition, some authors argue that crowdfunding might not be a quick solution to structural gaps in SME financing. Using data from the first wave of the Longitudinal Small Business Survey (LSBS), Broughton and Felici (2016) find that crowdfunding is still relatively uncommon compared to other forms of finance. In the LSBS, 1.8% of all firms are using crowdfunding, compared to 42% using bank overdrafts, 40% using credit cards, and 32% using a loan from a bank or building society. In addition, crowdfunding appears to be relatively difficult to obtain compared to other sources of finance (success rates are below 50%). Finally, the authors argue that crowdfunded firms tend to be firms that are already able to access other forms of external finance.

In addition to supply-side constraints, there are indications of demand-side issues affecting access to finance. Growth-oriented SMEs appear discouraged from seeking bank credit, so that rejection rates understate the extent of credit constraints. Brown et al. (2018) report data from the LSBS which suggest that one in ten SMEs (9.3%) can be classified as being a “discouraged borrower”, defined as “a good firm, requiring finance, that chooses not to apply to the bank because it feels its application will be rejected” (Kon and Storey, 2003). Worryingly, discouragement varies strongly in terms of a firm's future growth-orientation, with growth-oriented SMEs substantially more likely to be discouraged borrowers than non-growth-oriented ones. Such discouragement can put a brake on SMEs' growth ambitions. In other words, there might be a virtuous cycle between the availability of finance (and the awareness of it) and firms' growth ambitions and outcomes.

Importantly, bank lending conditions and peer-to-peer lending (debt crowdfunding) are unlikely to be good barometers for the availability of external finance for innovative firms. A further easing of banking conditions is very unlikely to fill the financing gap because equity is more appropriate to finance risk than debt. Attention is needed to re-build an equity culture in the UK (see e.g. Kay, 2012), and UK equity markets for SMEs are in need of policy intervention. Equity investment remains clustered in London and the South East. The data show that UK SMEs typically use very little equity from third parties (BDRC, 2018), and the majority of crowdfunded firms use debt crowdfunding rather than equity crowdfunding (Broughton and Felici, 2016). The British Business Bank recognises that venture capital markets remain a crucial area for improvement (British Business Bank, 2018). The government should continue to support the development of venture capital trusts (VCTs) through tax benefits.¹¹

¹¹ Venture Capital Trusts invest in small or early-stage businesses that are either listed on AIM (the London Stock Exchange's market for growth companies) or unquoted. These businesses are typically much riskier than larger, more established firms.

2.4. Can credit constraints explain low productivity in the UK?

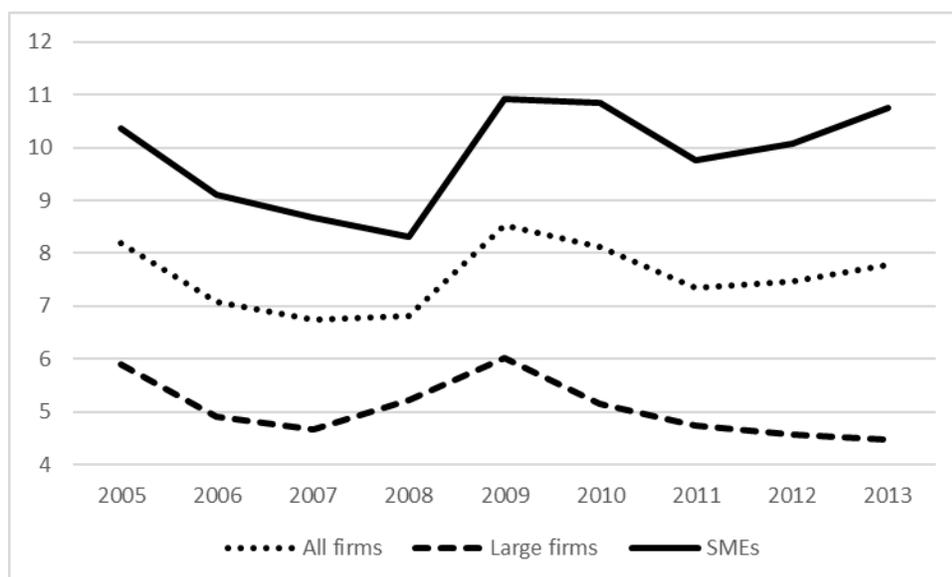
Many SMEs still rely on bank funding (Broughton and Felici, 2016). There is evidence that the credit supply shock harmed firm-level productivity in the UK. For example, Franklin et al. (2015) find that the contraction in credit supply reduced labour productivity, wages and the capital intensity of production at the firm level. Firms experiencing adverse credit shocks were also more likely to fail, all else equal. However, this does not tell us how important credit constraints are for the economy as a whole.

In recent research with Tim Besley and John Van Reenen, we quantify the impact of credit constraints on aggregate output and productivity in the UK (Besley et al., 2019). We measure credit constraints at the firm level with a firm's probability of default. From a lender's perspective, the main reason for declining an application for a loan or overdraft is that they judge that the potential borrower is unlikely to be able to service the debt. Risk perceptions by banks have increased significantly since the financial crisis. We examine how this translates into output and productivity losses. Our research suggests that heightened risk perceptions could account for over half of the 2008-09 productivity fall and around 20% of the gap between actual and trend productivity by the end of 2013.

Lending to SMEs carries a higher risk for lenders. They often lack substantial assets to act as collateral or a track record of financial performance (such as audited financial statements) or may not have a longstanding relationship with a bank (Berger and Udell, 2002 and 2006; Berger and Udell 2007). Collateral and a track record of financial performance are crucial determinants of how risky a firm is perceived by lenders. We combine data on employment, output, and investment (from the Annual Business Inquiry and Annual Business Survey) with an estimate of each firm's probability of default. We estimate default risk using Standard and Poor's PD Model in combination with accounting data from Bureau Van Dijk Orbis. This provides a unique data set that can be used to examine the relationship between default risk and firm performance.

Figure 4 shows the evolution of aggregate default risk in the UK, for SMEs and large firms. Default risk is systematically higher for SMEs than for large firms – showing that lenders regard SMEs as riskier. Second, the time-series patterns show that default probabilities are countercyclical, decreasing prior to the global financial crisis, rising sharply during the crisis, and falling back thereafter roughly to pre-crisis levels. However, there is clear heterogeneity between SMEs and large firms. The jump during the crisis was larger for SMEs, and unlike their larger counterparts, their default probabilities have stayed elevated through 2013. We find that default risk is significantly negatively correlated with firm performance, such as employment, investment, and value added. For example, a 10% decrease in a firm's default probability is associated with a 0.3% increase in employment on average.

FIGURE 4: Aggregate default risk of UK firms, by size category



Notes: A firm's default probability is given by the probability that it will default on its payments at the one-year horizon according to S&P's PD Model and historical default rates from S&P's CreditPro. SMEs (solid line) are Small and Medium-Sized Enterprises defined as firms with fewer than 250 employees. Large firms (long dashed line) are firms with 250 employees or more. Firm-level default probabilities are aggregated using employment weights. The sample is the market sector in the IDBR (Inter-departmental Business Register).

According to our model, the increase in default probabilities reflects the deterioration of credit conditions faced by UK firms during and after the financial crisis. Our model suggests several factors that are likely to have been at work. First, banks' funding conditions deteriorated due to stress in inter-bank markets. Higher funding costs translate into a higher cost of capital for borrowers. Second, the valuation of commercial real estate saw a sharp decline during the crisis, which can be thought of as a fall in collateral values. A fall in collateral values also translates into a higher cost of capital, since lenders expect to recover less in case of default. Third, competition in the UK banking sector was negatively affected during the crisis. In 2010, concentration was higher than before the crisis in many retail banking sub-markets, including SME banking (Independent Commission on Banking, 2011). A lack of competition increases the cost of capital as it makes it more difficult for firms to shop around for better deals.

In a second step, we develop a model which enables us to estimate the output losses from increased risk perceptions for the UK economy as a whole. Increased risk perceptions entail a higher cost of capital for borrowers. The cost of capital determines the allocation of capital across firms as each firm's marginal product of capital is set equal to its bank's risk-adjusted cost of funds. Firms with higher default risk are allocated less capital, all else equal. We decompose the total losses into two components. The first captures the losses driven by the impact of credit constraints on the aggregate stock of capital. If risk perceptions increase on average, all firms will face tighter credit constraints. Tighter credit constraints lead to a lower aggregate stock of capital in the economy (capital shallowing) as each firm is offered a lower credit volume by its lender. The second component captures losses driven by the misallocation of capital. Capital is misallocated when it

is channelled to low-productivity firms. Take for example firm A and firm B. Firm A is fundamentally more productive than firm B, but has experienced a larger negative shock to the value of its collateral assets and its perceived level of risk as a borrower increases accordingly relative to that of firm B. In this case, capital is reallocated from firm A to firm B, leading to lower aggregate productivity. The results are presented in Table 1.

TABLE 1: Output losses due to default risk (in %)

	Total All firms	Capital shallowing All firms	Misallocation of capital All firms	Total SMEs	Total Large firms
	(1)	(2)	(3)	(4)	(5)
2005	27.7	25.9	1.8	32.2	21.2
2006	26.4	24.5	1.8	30.8	19.5
2007	26.0	24.1	1.9	30.4	19.3
2008	25.6	23.8	1.8	30.0	19.4
2009	29.1	27.0	2.1	34.5	21.3
2010	28.4	26.4	2.0	34.5	19.6
2011	28.3	26.0	2.3	32.9	21.1
2012	28.2	26.0	2.2	33.8	19.9
2013	28.2	26.0	2.2	34.6	19.0
Average	27.5	25.5	2.0	32.6	20.0

Source: Besley, Roland, and Van Reenen (2019).

Column (1) contains the estimates of aggregate output losses for every year in the sample. Column (2) shows the losses that can be attributed to a decrease in the aggregate capital stock, and Column (3) shows the losses that result from the misallocation of credit. Columns (4) and (5) report total losses for SMEs and large firms, considered in isolation.

The estimates in Column (1) suggest that credit frictions cause an average loss of 27.5% of GDP per year in 2005-2013. The aggregate impact of credit frictions has worsened, particularly following the onset of the financial crisis in 2007. This is consistent with the time path of default risk in Figure 4. Overall, we estimate that in 2009 output was 29.1% lower than it would have been in the absence of default risk, compared to 26% in 2007. Columns (2) and (3) show that the total losses are predominantly driven by a lower aggregate capital stock, “capital shallowing”, rather than the misallocation of credit. For example, in 2013 the 28.2% total loss divides into 26% from capital shallowing and 2.2% from misallocation. The losses from misallocation have also increased, but they remain relatively small in magnitude. On average, capital shallowing accounts for about 93% of the overall output losses. The results point to credit frictions as being one of the drivers behind the low UK’s aggregate investment rate.¹² This also suggests that misallocation of credit might not be a severe problem in the UK. Columns (4) and (5) show that the losses from credit frictions affect SMEs more severely than they do large firms. Figure 5 shows the results of Table 1 on total losses, by firm size.

¹² The UK’s aggregate investment rate is the lowest in the G7 (ONS, 2017b).

FIGURE 5: Output losses due to default risk (in %), by size



Source: Besley, Roland, and Van Reenen (2019).

The output losses due to default risk for SMEs are larger than those for large firms on average (32.6% compared to 20% for large firms). This is consistent with SMEs being on average perceived as riskier and accordingly facing tighter credit constraints. In addition, while credit conditions have deteriorated for both SMEs and large firms – as reflected in increased losses since 2007, SMEs have been affected more severely by increased default risk perceptions. In 2007 the output losses were 30.4% for SMEs and 19.3% for large firms. By 2009, the size of the effect had risen to 34.5% and 21.3% respectively. This is consistent with evidence presented above that SMEs faced tighter credit constraints than large firms during and following the financial crisis. With the return of economic growth and the improvement of firms’ balance sheet positions, risk perceptions should start declining. This would be reflected in decreasing output losses. However, output losses will persist as long as risk perceptions remain elevated. At the end of 2013, output losses remained elevated for SMEs (34.6%), but had declined to 19% for large firms – reflecting continuing heightened risk perceptions for the former and a recovery in risk perceptions for the latter.

Our framework can be used to examine the contribution of credit frictions to the productivity growth slowdown. We estimate that in 2009, a worsening of credit frictions caused a 4.8% loss of output. The actual fall of labour productivity between 2009 and 2008 was 9.3% (according to the ABI/ABS surveys), implying that credit frictions account for just over half (4.8/9.3) of the productivity slump in the Great Recession. The deterioration in perceived default risk since 2007 is persistent and accounts for around 20% of the gap between actual and trend productivity by the end of 2013.

3. Management practices and SME productivity

3.1. UK managers underperform and contribute to low productivity

The OECD ranks the UK as one of the best places to start and grow a business. However, British firms are on average poorly managed and this is contributing to low productivity. Since the inception of the World Management Survey (WMS), a large literature has emerged which demonstrates the significance of management practices for productivity at the firm level and at the country level.¹³ The WMS is an interview-based survey that defines 18 management practices and scores firms from 1 (worst practice) to 5 (best practice) in a standardised way across countries. A high score represents better practices: a firm with a higher score will, on average, be more productive. The measured practices cover four broad dimensions: operations, monitoring, targets, and incentives.¹⁴ Data collected in the WMS has shown that the UK not only has a long tail of poorly managed firms, but UK firms are also on average worse managed than those in the US and Germany (Bloom et al., 2017). Research indicates that management practices could account for around 55% of the total factor productivity gap between the UK and the US (Bloom et al., 2017). The relationship between management and productivity has been shown to be causal, rather than just a correlation (Bloom et al., 2013).

In the UK context, and building on the WMS work, the ONS has started conducting surveys on management practices, starting with the Management Practices Survey in 2015. In 2017, the ONS conducted the Management and Expectations Survey (MES) in collaboration with the Economic Statistics Centre of Excellence. The initial results (ONS, 2018b) find a significantly positive relationship between a firm's management practice score and its labour productivity (measured as gross value added per worker). Moving from the 25th percentile of the score distribution to the median translates into a 19% increase in labour productivity. Moving from the median of the score distribution to the 75th percentile translates into a further 12% increase in labour productivity.

Recent evidence from a sample of OECD countries shows that the productivity slowdown is accompanied by increasing productivity divergence between the “global frontier”, i.e. the most productive firms, and “laggard firms” (Andrews et al., 2016)¹⁵. In other words, the average growth rate of productivity is higher at the frontier than it is among all other firms. This pattern of divergence could be explained by a lack of diffusion of technology and best practices from the frontier to the laggards. Managerial practices could be an important part of the story. Saia et al. (2015) explore the factors that have a positive effect on the spillovers from productivity growth at the global frontier to productivity growth of the laggards. They show that an economy's ability to benefit from frontier innovation is a positive function of its investments in knowledge-based capital, including managerial capital and R&D. In particular, higher managerial capital, as measured in the Survey of Adult Skills, is associated with higher frontier spillovers. Andrews and Westmore (2014) come to the same conclusion that managerial capital is an “enabler of

¹³ See for example Bloom and Van Reenen (2007), Bloom et al. (2012), Bloom et al. (2013), Bloom et al. (2014), Bloom et al. (2017a, 2017b), and Bloom et al. (2018).

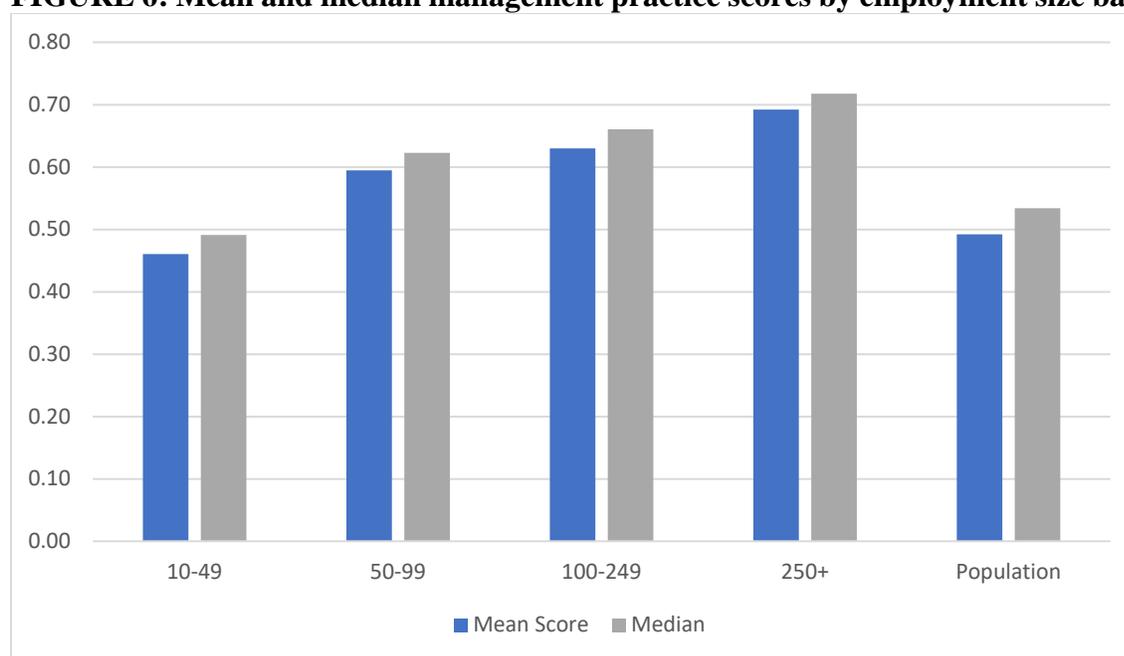
¹⁴ See Bloom and Van Reenen (2007) for details on the specific practices, and Bloom et al. (2017b) for details on the survey design.

¹⁵ Andrews et al. (2016) define global frontier firms as the top 5% of firms in terms of labour productivity or multi-factor productivity (MFP) levels within each two-digit industry in each year.

productivity convergence”. In line with the idea that managerial capital is complementary to technological adoption (Bloom et al., 2012), better management practices could encourage the adoption and implementation of existing and new technologies. Indeed, the adoption of new technologies, such as ICT, often requires organisational restructuring, which in turn necessitates good managerial skills.

One important common feature of empirical studies is that smaller firms tend to have poorer management practices. This picture emerges clearly from the MES (ONS, 2018b) (see Figure 6). Poor management practices are an issue for SMEs in general, but Lee (2011) finds that high-growth firms perceive the lack of managerial skills as an obstacle disproportionately more than other firms¹⁶. This is not surprising since managerial capital is complementary to technological adoption (Bloom et al., 2012).

FIGURE 6: Mean and median management practice scores by employment size bands, 2016



Source: Management and Expectations Survey, ONS (2018b).

There may be several reasons behind this finding. Bloom et al. (2011) find that the greatest constraint for improving management practices in the UK is an inadequate supply of managerial human capital. The next most important constraint is inadequate worker skills. This is consistent with previous findings by Simpson and Docherty (2004) who argue that one of the main reasons behind informal and obsolete management practices in small enterprises is a lack of knowledge. Beaver and Prince (2004) find that management in small businesses is often informal and driven by short-term operational needs, pointing to a lack of managerial skills. Larger firms adopt more formal management practices driven by longer-term growth objectives. The existing literature indicates that investment in human resource management practices, such as training, performance reviews, and incentive pay are most strongly correlated with productivity in the UK (e.g. Bryson

¹⁶ 41% of high growth firms see managerial skills as a significant obstacle to their success compared to only 32% of potential high growth firms and 27% of other firms (Lee, 2011).

and Forth, 2018; ONS, 2018b). The third most important constraint identified by Bloom et al. (2011) is informational barriers. In other words, firms do not know what changes to make. Hart and Roper (2013) also suggest that SMEs find it more difficult than larger firms to identify and adopt innovative technologies and working methods due to their weaker internal resources.

Beyond skills and information, ownership and control matter greatly. Smaller firms are often family-owned and family-run. Those that use primogeniture to choose their CEO perform particularly poorly (Bloom et al., 2014). Finally, in addition to factors internal to the firm, external factors can play an important role as well. Bloom et al. (2017a) find that higher levels of competition are associated with better management practices. To the extent that SMEs are more likely to operate in smaller and more local markets, a lack of exposure to strong competition may hold them back from improving their practices. The institutional environment and the proximity of leading businesses also matter. Using US data, Bloom et al. (2018) find causal evidence that regulation of the business environment and the learning spillovers from the arrival of large new entrants boost management practices. The latter result suggests that programmes such as “Be the Business” and “Productivity through People” launched by the Productivity Leadership Group (PLG) could have a powerful impact through the diffusion of knowledge from leading businesses to SMEs.

3.2. Can better management practices alleviate financial constraints?

Better management practices are likely to affect firm performance through changes in firm behaviour other than operational and technological. One important aspect of firm behaviour that might be influenced by management practices is financial policy. Financial policies, including cash savings, are among some of the most important decisions that firms make on a daily basis. They affect productivity because they influence a firm’s ability to invest. Cash savings are particularly important for financially constrained firms. Firms with larger cash reserves are better able to meet their funding needs when they experience unanticipated cash flow shortfalls and cannot resort to external finance. This idea dates back as far as Keynes (1936) who argues that firms with valuable investment opportunities and volatile cash flow should accumulate precautionary cash balances. In other words, the cash-saving decisions of financially constrained firms should be more responsive to cash flow volatility than those of unconstrained firms. This is because if these firms find themselves short of funds, they could have to forego profitable investments. This idea has been developed in seminal corporate finance papers (Myers, 1984, and Myers and Majluf, 1984). In recent research, I explore the link between managerial capital and firms’ cash saving policies in the UK (Roland, 2018). The research shows that better management practices are associated with more prudent cash policies. Better managed firms accumulate more cash in response to cash flow volatility. This result holds mainly for small firms, which are more likely to be financially constrained. This enhanced precautionary behaviour is likely to positively affect productivity because it influences a firm’s ability to invest. In future research, I plan to investigate whether this is the case.

There are many reasons why better managed firms might be better at “saving for a rainy day”. First, management practices can help alleviate agency conflicts. Cash reserves are easily accessible by management and much of their use might be left at their discretion. Formal management practices can help prevent cash diversion such as the consumption of perks, wasteful behaviour,

or simply prevent managers from enjoying a “quiet life” (Bertrand and Mullainathan, 2003). A formal managerial framework gives the firm’s owners the confidence that cash reserves will be put to good use. Management practices may also help alleviate problems of “managerial myopia”, whereby managers are driven by short-term objectives, such as career concerns, rather than the long-term prospects of the firm. Second, managerial capital enables firms to plan ahead better. The constant monitoring of performance and target achievement enables managers to form a more accurate idea of where the firm stands and where it is going. Better managed firms can anticipate cash flows, investment opportunities, and future financing needs more efficiently. This is consistent with the results of Beaver and Prince (2004) who find that management in small businesses is often driven by short-term operational needs, rather than longer-term growth objectives.

Using data from the World Management Survey and administrative and accounting data on manufacturing firms in the UK, I find evidence in support of the hypothesis that better management practices are associated with enhanced precautionary behaviour. First, the results suggest that UK firms in general accumulate precautionary savings when faced with cash flow volatility. For a given level of management quality, an increase in cash flow volatility from the 25th to the 75th percentile is associated with an increase in year-on-year savings (as a percentage of total assets) of 0.24 to 0.50 percentage points. This effect is significant and large in magnitude when compared to the median firm’s cash savings as a fraction of its total assets. Crucially, this precautionary behaviour is enhanced by better management practices. In other words, a given increase in cash flow volatility is associated with a higher response of the cash-to-asset ratio when a firm has a higher management score. More specifically, a one standard deviation increase in the management score is associated with an increase in the savings-to-asset ratio by an *additional* 0.23 to 0.36 percentage points in response to an increase in cash flow volatility from the 25th to the 75th percentile of the cash flow distribution.

Theory predicts that financially constrained firms are those that most benefit from cash reserves. I proxy financial constraints with firm size and define small firms as having total assets below the sample median. The findings above are more marked for small firms. The effect of volatility alone almost doubles, while the additional effect of better management practices increases by more than half (see Table 2) compared to the full sample. By contrast, neither cash flow volatility nor management quality have a significant effect on large firms’ savings behaviour.

TABLE 2: Cash saving behaviour in response to cash flow volatility

Increase in cash-to-assets ratio in response to an increase in cash flow volatility from the 25th to the 75th percentile	All firms	Small firms
Direct effect of volatility alone	0.24pp-0.5pp	0.49pp-0.89pp
<i>Additional</i> effect of management practices	0.23pp-0.36pp	0.36pp-0.49pp
Total effect	0.47pp-0.86pp	0.85pp-1.38pp

Source: Roland (2018).

Since it is well documented that small firms are subject to tighter financial constraints, this suggests that managerial quality might improve firm performance by allowing financially constrained firms to save more efficiently for a rainy day, and in turn invest more efficiently. Hence, management

practices can play an important role in mitigating the impact of credit constraints on investment. In future research, I plan to investigate the link between management practices and investment dynamics. Finally, this project opens the way for research into the link between productivity and management practices through the latter's impact on a variety of corporate policies, including a large range of financial decisions other than cash savings (e.g. leverage, dividend payments), investment policies, M&A activity, and risk management.

4. Conclusions and policy implications

The Industrial Strategy White Paper is a first step in the right direction. The next challenge will be to turn its broad proposals into concrete plans, with details on the substance of the deals in each and every area of intervention. The creation of a national industrial strategy council is a welcome step in ensuring that subsequent governments are accountable for progress. Maintaining the existing funding commitments in the face of low growth forecasts and the uncertainty surrounding the UK's exit from the EU will be a challenge. Backtracking on existing funding commitments would be damaging, especially since some of them already appear small compared to the scale of the problems. For example, the commitment to reach 2.4 per cent of GDP investment in R&D by 2027 appears too timid to turn the UK into a world-leader in innovation. The US and Germany spent 2.7% and 2.9% of their GDP on R&D respectively in 2016¹⁷, above the UK's 2027 target set out in the White Paper.

Policies that address access to finance and management practices for SMEs are economy-wide – they have the potential to unleash substantial productivity gains by reaching a large fraction of the business population across a wide variety of sectors and in all the UK's regions. However, the SME population is heterogeneous, and policies should reflect this. While access to finance is vital for the success of SMEs as a whole, it matters more for firms that have the ambition or the potential to invest in innovation and become high-growth firms (HGFs). Most SMEs in the UK are simply focused on remaining in business and have no intention to grow. **Interventions that target firms with higher growth potential are likely to be more efficient than general business support policy for all SMEs.** Recent evidence suggests that young SMEs have been the most dynamic job creators over most of the past decade. However, the literature suggests that size and age alone are not good identifiers of HGFs. Many start-ups do not survive, and many small firms remain small for long periods of time.

While it is clear that policy-makers should focus on quality, and not just quantity, **identifying firms with growth potential is a substantial challenge.** There is considerable debate around the definition of high-growth firms, and the overall picture of their significance for job creation and growth differs depending on the precise definitions and measurement methods used. The dynamics of firm growth are complex, and one must not get fixated on any single definition at the risk of “misclassifying” firms. Since identifying and supporting firms with growth potential is at the heart of the government's Industrial Strategy, more research is needed on job creation and destruction, survival, and the productivity growth contribution of different types of firms, by age and size profile.

¹⁷ OECD MSTI Database.

While bank lending conditions have eased, firms that seek to innovate and grow still face substantial challenges. This is potentially an important drag on UK productivity growth as high-growth firms contribute disproportionately to growth and job creation in the UK. **Businesses that have the ambition to grow need a funding environment able to support the risks associated with innovation and early-stage ventures. This means diversifying financing sources away from bank lending.** There is evidence of sizeable output losses from increased risk perceptions that curtail firms' access to bank credit, especially among SMEs (Besley et al., 2019). Our research suggests that heightened risk perceptions could account for over half of the 2008-09 productivity fall and around 20% of the gap between actual and trend productivity by the end of 2013. **Much remains to be done to create an equity culture in the UK** (see e.g. Kay, 2012). The recent launch of the British Patient Capital Programme is a welcome development. The government should continue to support the development of venture capital trusts (VCTs) through tax benefits.

Proximity and information are key. The network of regional managers of the British Business Bank should be levered to help foster inclusive growth. First, there are clear regional imbalances in the supply of finance, with London and the South-East facing more favourable conditions (British Business Bank, 2018). A regional network that caters to local needs can help close those regional disparities. Second, proximity is particularly important for SMEs as they often lack the information on the sources of financing that are available to them and how to access them. The recent launch of the British Business Bank's new Finance Finder to help smaller businesses identify their finance options is a welcome step to tackle the lack of knowledge that plagues British businesses.

Substantial productivity gains can still be achieved by improving management practices across the entire population of SMEs. The UK has a long-tail of poorly managed low-productivity firms. They could achieve substantial productivity gains through the adoption of technologies and ideas that are already in existence and have been proven to work. Catching up with existing and new technologies requires managerial capital. **Since management practices are a relatively new policy area, work is needed to explore which interventions have the best potential to boost the productivity of UK firms.** The government has recognised this and recently launched the Business Basics Programme as part of its Industrial Strategy. The programme was set up to invest in trials of innovative ways to encourage SMEs to adopt productivity boosting technologies or business practices. The programme "Productivity through People" launched by the Productivity Leadership Group (PLG) is also a welcome step. Enabling SMEs to learn from leading businesses could generate substantial spillovers.

Finally, the government should consider putting management policies fully under the umbrella of the British Business Bank. Valuable lessons can be learned from international experience, for example the "Operational Efficiency Program" managed by the Business Development Bank of Canada. Packaging managerial training and advisory with financial support could be a powerful cocktail for boosting productivity.

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