CHAPTER **THREE**

A firm response

Business responses to the labour market tipping point will vary by sector

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The state we're in

Automation provides a route for some sectors, including construction and retail, to adjust to a changing labour market

But UK total investment is currently lower than the OECD and European Union averages

The occupations facing skills shortages could double, providing a further spur to change in some sectors

The proportion of adults with access to work-based training is below the OECD average and most training lasts less than a week

What should we do?

As part of an industrial strategy the government should proactively make sectoral deals with those industries most affected by changes at the bottom of the labour market – particularly those likely to struggle with automation or face severe skills shortages

The government should do more to encourage firms to make use of apprenticeships of Level 3 and above and more apprenticeships should come with nationally recognised qualifications

So far we have set out significant changes that are likely to affect the bottom of the UK labour market in the coming years, and the difficulty firms may have responding to those changes if they are unprepared for them – as they currently are on migration. The next question centres on what types of responses are feasible and desirable, once the reality of change has been recognised. Chapters 4-6 explore the role that government can play in responding to and shaping this changing labour market, but the subject of this chapter is the response we might expect from firms themselves.

In particular, we note that among the firms and sectors most affected by the tipping point of the availability and relative price of lower paid labour, very different adjustment strategies will be relevant. For some, the prospect of automation, far from being the job-destroying bogeyman of much media coverage, may provide a viable adjustment strategy to a higher productivity business model. This chapter identifies where that may be the case, however it notes the worrying trend that many industries with the

most to gain from increases in investment have traditionally been among the least likely to engage in such activity.

For other firms affected by labour market shifts, the nature of the work and state of technology means such an approach may not be viable. This is particularly concerning in sectors that also look likely to face the most severe skills shortages. These sections of our economy should be a key part of any industrial strategy because of the clear need for a shared view of their future role in the UK economy between firms and government. Changing what they produce as well as how it is produced will be important questions going forward.

Understanding how responses to the tipping point might vary across the UK economy – and therefore where the biggest challenges may be – will be crucial to making sure the country is as prepared as it can be for the change that is underway.

Some lower-skilled sectors could make significant gains from increased automation, but investment levels are low

Economic theory, international evidence and some early indications from firms' response to the rising National Living Wage (NLW) point to greater investment in capital being a key route through which firms respond to a combination of rising labour costs at the bottom end of the labour market and tightened labour supply. The financial incentives to do so clearly rise with labour costs, while tight and very uncertain labour supply prospects will also make the case for greater investment in capital to produce a given level of output.

International evidence on how businesses respond to big reductions in low-paid migration does show significant shifts towards more automation (alongside changes in what is produced in the first place).[1] Domestically, this is also a message that has come through in our research, with two in three firms affected by the NLW for example taking up measures in the first six months to increase their productivity.[2] Encouragingly, a third of firms we surveyed who felt that a fall in EU migration would lead them to change the way their business is run said that they would invest more in technology.[3] Such an approach would be the reverse of one explanation for why the post-crisis fall in productivity (the so-called productivity puzzle) has been particularly deep for the UK, where the argument runs that firms have substituted relatively cheap and available labour for investment in capital.[4]

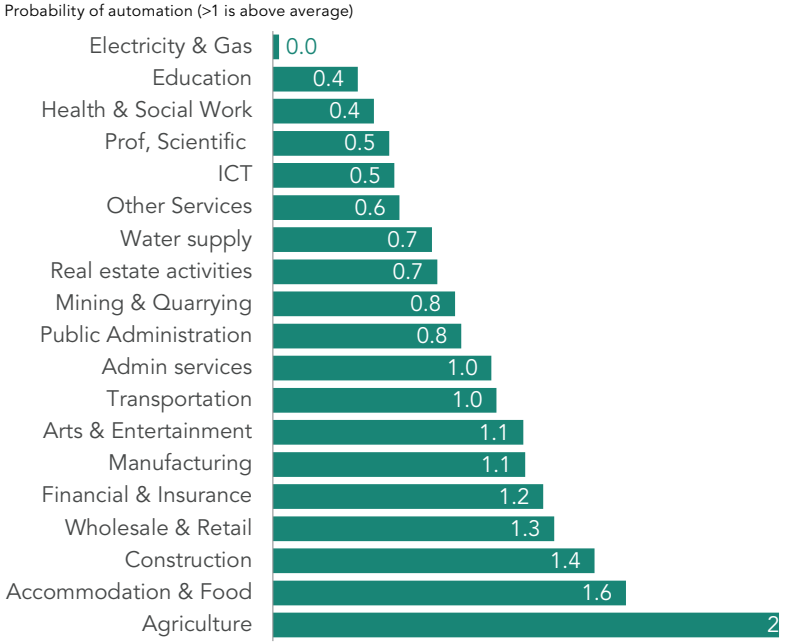
Not all firms and sectors have the same opportunities for technology-linked productivity gains

However, while there is clearly appetite among some firms, the extent to which capital investment and greater automation is a feasible response will vary hugely. Simply put, not all firms and sectors have the same opportunities for technology-linked productivity gains.

To assess which sectors most affected by coming shifts to the low-paid part of the UK labour market have the greatest potential to respond with greater automation, we can use work showing the number of jobs that could be replaced by robots over the coming years. These estimates – which vary from 10 per cent to 35 per cent of jobs by the early 2030s – are inevitably highly uncertain and are more typically set out as describing the scale of the 'threat' posed by robots to existing workers.[5] However, the estimates might also be considered to show the scale of 'opportunity' for automation that exists across different industries. They provide a useful jumping off point for considering where across the UK economy automation looks most and least likely to occur. In this chapter we use the estimates produced by Bakhshi, Frey and Osborne, which given they suggest more scope for automation than some of the other estimates can perhaps be thought of as an upper-limit to what we can expect from sectors.

Figure 1 sets out the results. Among the sectors most likely to be affected by the labour market shifts underpinning this book big differences are visible, with the agricultural sector having the most significant scope for further automation and social care having very little at all.

Figure 1: **Automation**



Source: RF analysis of Bakhshi et al, 2015

Drilling down below the broad industrial categories depicted in the chart, we can isolate those sectors that are judged as having a relatively high probability of automation (within the top 25 of the 80 sectors) and are most affected by higher costs and lower availability of low paid labour. We are left with a list of 11 industries that could be particularly affected by rising labour costs and reduced access to migrant labour (see Chapter 2), and which might be well placed to make gains via automation:

- Agriculture
- Food and drink service activities
- Postal and courier activities
- Retail trade
- Gambling and betting activities
- Printing and recorded media
- Specialised construction (electrical work, demolition, plumbing)
- Accommodation
- Construction of buildings
- Manufacturing of materials (metal, paper, plastic, textiles)
- Food manufacturing

The history of investment in the UK offers some caution about whether these opportunities for automation will be realised

The fact that opportunities for investment in technology exist for firms considering responses to a changing labour market is, however, only part of the answer. Firms also have to take advantage of those opportunities.

It is therefore not encouraging that UK capital investment is low by international standards. Gross fixed capital formation is lower than the OECD and Euro Area average and firms account for a smaller share of total British investment than in many other developed countries.[6]

Moving beyond the overall poor investment performance, sectoral level analysis reinforces the scale of the change in business models and behaviour that a shift towards capital investment in low paying sectors would mean. Figure 2 compares the estimated propensity for automation across sectors (x-axis), with changes in investment levels between 1997 and 2015 (y-axis).

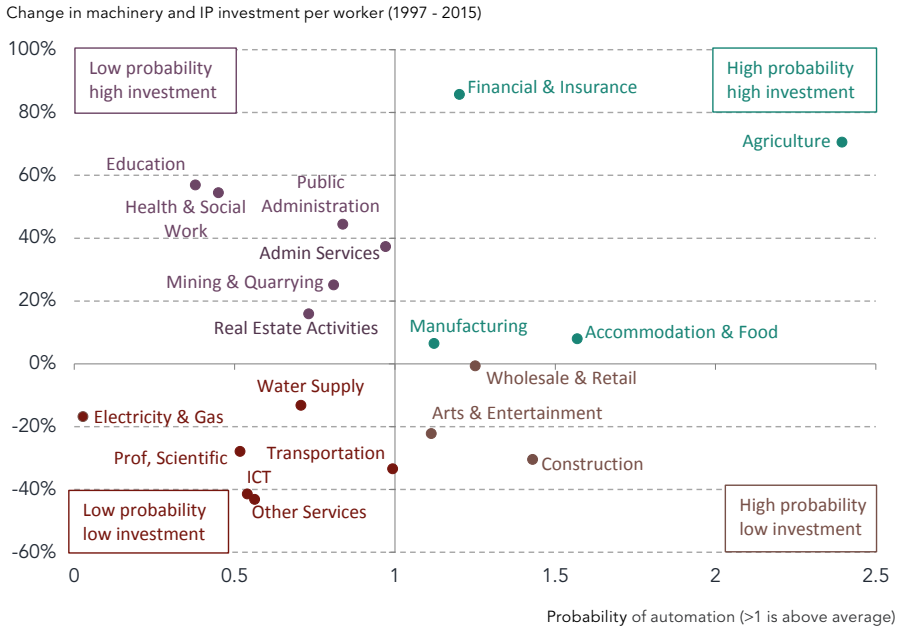
It is not encouraging that UK capital investment is low by international standards

The first thing to note is investment in machinery and intellectual property has fallen in many sectors, further emphasising that there may be a general dearth of investment. Secondly there has been no strong evidence that investment over the last 20 years has been any higher among these lower-paid, more tech-ready industries. There are exceptions to this (agriculture) but the general picture is that some sectors have taken

advantage of technology (finance) whereas other sectors have remained labour intensive, including those that we are now focused on (construction and retail for example). Although there are some sectors that buck the trend (health and social work stand out) the wider evidence is that even in low-paying sectors where technology is available, investment is lower than is recorded in the same sectors in other European countries.[7]

Even where the opportunity for greater automation exists, it will of course be for firms in such sectors to decide themselves whether or not the tipping point associated

Figure 2: **Automation and investment across UK industries**



Sources: RF analysis of Bakhshi et al, 2015, & ONS, *LFS*

with changes at the bottom end of the labour market is sufficient to spur them into action. In all likelihood, normal market forces will dictate that some firms react and progress, while others struggle to adapt.

Much bigger will be the challenge facing firms in sectors where technology has less obvious applications, particularly where this coincides with potential labour shortages associated with lower migration. It is to this issue that we now turn.

The scale of challenge in different sectors will also be affected by skills shortages that changes in migration create

Alongside investment in technology, adjusting their use of human capital is a key part of the response available to firms. Even ahead of the Brexit vote, UK firms voiced concern over their access to the skills they need. In 2015, businesses reported over 200,000 skill shortage vacancies, up 43 per cent on 2013.[8] Likewise, in April 2016 – just ahead of the referendum – nearly 70 per cent of firms (a record high) told the Confederation of Business Industry that they couldn't access enough workers with the skills they needed.[9]

As discussed in Chapters 1 and 2, the process of Brexit and any associated reduction in the supply of foreign labour is likely to compound this problem, particularly in the short term. Hiring workers from EU/EEA countries is currently relatively straightforward, in contrast to the complexity involved with recruiting workers from the rest of the world to fill skills shortages. We discussed the UK's immigration system and the role of the Migration Advisory Council (MAC) at length in the previous chapter, but the focus here is on one particular part of the system, the shortage occupation list, and what it can tell us about where firms' might struggle most to respond to a changing labour market.

i Box 1: How the MAC decides if an occupation should go on the shortage list

The MAC provides advice to the government on which skilled occupations (non-skilled are not considered) should be placed on the shortage list.[10] It conducts analysis using a variety of indicators of labour market shortage. These are split into four types:

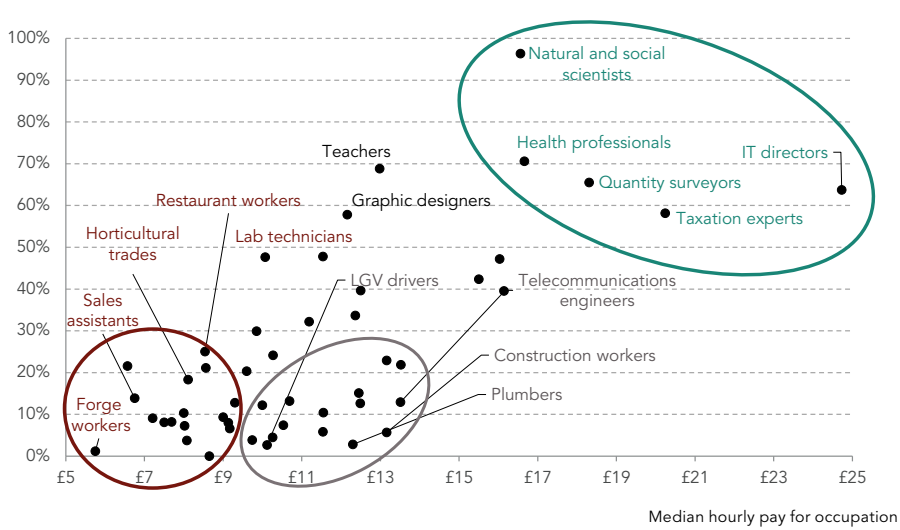
- employer-based (surveys about demand for workers and vacancies);
- price-based (market pressure on wages);
- volume-based (utilisation indicators, such as rises in hours worked or employment levels); and
- indicators of imbalance (such as vacancy duration or claimant count by sought occupation).

The MAC also makes a 'bottom-up' assessment of occupations by speaking to professionals and sectoral representatives. It only decides to place an occupation on the list if it believes that bringing in immigrants would have little detrimental impact on local skills acquisition, productivity, and the wider UK labour market. [11]

In order to explore which occupations are more likely to face skills shortages in the new world of an end to free movement, we – as far as possible – can replicate the MAC's approach.[12] In our simplified thought experiment, we remove all EU/EEA migrants from the workforce and consider how different occupations then fare against the MAC scoring system. This is of course an extreme example, but serves as a useful illustration of the sectors which might face additional skill shortages under a tighter post-Brexit migration regime.

In total, 50 out of 369 occupations (14 per cent) are flagged as facing shortages in our model – almost double the current number of occupations on the MAC list. Figure 3 sets out these occupations and splits them on the basis of underlying skill level (y-axis) and average pay (x-axis). These distinctions matter because, although we have no indication yet from the government about how they intend to address skills shortages within a new migration regime, lower-skilled occupations are less likely to make it onto any future MAC shortage list, while occupations with lower pay rates are likely to find it harder to entice UK workers to plug any gaps, and firms in these areas will also face the challenge of responding to a higher NLW.

Figure 3: **Sectors that may face skills shortages after freedom of movement ends**



Notes: Wage data is from the Labour Force Survey. This is less accurate than sources such as the Annual Survey of Hours and Earnings (ASHE), but allows us to look at pay by occupation and education.

Source: RF analysis of ONS, *LFS*

We can identify three different groups of occupations from this chart. Largely irrelevant to the focus of this piece are those in the top right that are both relatively high-skilled and relatively high-paying. They are therefore more likely to qualify for the shortage list (indeed some are already on the list) and meet the salary threshold. As noted in the last chapter though, some slightly lower-paying but higher-skilled occupations – such as teachers and graphic designers – might face more difficulties given the current level of the salary threshold.

Shifting to a second group in the bottom centre part of the chart – covering occupations such as plumbers, construction workers, telecom engineers and technicians – we might speculate that firms relying on these occupations are unlikely to benefit from access to labour from the current non-EU/EEA migration regime. That means a higher bar for a successful response to a shifting labour market. These firms do however have scope within existing business models to train up native workers to fill such roles, even if that has cost implications and requires a mindset change about who the firms' workers of tomorrow will be. Crucially, as these occupations have pay levels above the NLW and so can offer pay progression to workers engaging in that training who would previously have been doing lower paid work.

Encouragingly, employers are aware that human as well as physical capital change may be needed

In contrast, those sectors in the bottom left of the chart – including sales assistants, restaurant workers and LGV drivers – might be considered especially vulnerable as under current rules they are unlikely to qualify for the shortage list, face wider constraints on their ability to respond by spending on training or to compete on relative pay given they are most affected by the fast rising NLW. As we noted above, there might be some scope for automation, but this is not always the case. Where it is not, wider business model shifts will have to be examined, including lowering staff numbers (with quality effects), hiring workers from groups not previously looked to (including the young and disabled), or trying to move to a higher-paying equilibrium to attract staff with obvious implications for prices and profits. Some firms could also decide to stop producing certain goods and services in the UK.

Adjusting to greater investment in human capital will not be straightforward

By highlighting which sectors may face the most acute skills shortages or the least opportunity to look to automation, we can start to identify where firms relying on lower paid labour may have more difficulty adjusting to a changed labour market and where a focus on training might be most needed.

Encouragingly, employers are aware that human as well as physical capital change may be needed. In the survey of employers we carried out as part of this project, 34 per

cent of firms said that, faced with a decline in EU labour, they would try to hire more British workers. Similarly, the most popular way that firms had attempted to raise productivity in response to the NLW was to invest in training.[13] Such initial steps are welcome and the government can stimulate further change by providing more clarity about how the future migration regime might operate, and in particular how skill shortages will be dealt with.

The worrying news for our post-Brexit world of work is that – despite positive intentions – British firms tend to underinvest in human capital. The proportion of adults with access to work-based training is below the OECD average, and most training (52 per cent) lasts less than a week.[14] More generally, business surveys indicate the need to upskill and retrain workers of all ages and qualification levels.[15]

Perhaps more troublingly in the context of how well our skills system is set-up to ease the load of firms responding to shifts at the bottom of the labour market, UK skills training is unequally distributed. It tends to be undertaken primarily by those with higher qualifications and higher pay. This is perhaps unsurprising and is partly explained by the fact that training tends to raise wages. However, it does suggest that those sectors that may be in most need of additional investment in human capital in the future are the least likely to get it.

The problem is compounded by the fact that the 60 per cent of young people who do not go onto university at age 18 face a bewildering array of educational pathways. These often do a poor job of equipping them with the skills necessary for the modern labour market.[16] In short, education and training may be able to address some of the skills shortages that the UK is likely to face in future. But this will not happen until technical education and work-based training are actively improved.

Supporting firms contending with a labour market tipping point means improving the domestic skills system

In large part it will be for firms themselves to determine the most appropriate response to the pressures associated with the combination of rising costs in the bottom part of the labour market and an exogenous labour supply shock. Alongside the efforts we have set out above that are designed to maintain a certain level of output, it's also feasible that firms decide to trade down on quality or simply produce less.

Ultimately we can expect market forces to bring UK businesses to a new equilibrium in the post-Brexit world. But government intervention could help both ease the transition to this new equilibrium and nudge it in the direction of a higher-value economic model.

By way of preparing for the end of free movement, the MAC should undertake a similar exercise to the one we have set out above – providing an assessment of the occupations it expects to be most affected. Once it does this, the government will be in a better place

to provide guidance to firms about whether they can expect to access migrant labour once the country leaves the EU. Some expansion of the shortage occupation list – given the potential doubling in our modelling – is likely to be necessary. But it is important that the government provides more clarity about which occupations are unlikely to make the list. The more detail firms have, the more likely they are to make investment decisions that take a number of years to come to fruition.

The new Apprenticeship Levy is another opportunity to increase technical skills provision

There should also be a wider evaluation of how the new immigration system interacts with the UK's skills system (something we discussed in more detail in the previous chapter). This is particularly important given that a significant expansion of the shortage occupation list may run against the government's target of reducing net migration to the tens of thousands.

Improving the UK skills system – especially in relation to intermediate skills and technical education – is a big task, and one worth undertaking even in the absence of any shift in the functioning of our labour market.[17] For example, there should be more intermediate and higher-level technical provision. The Government's Post-16 Skills Plan and the Apprenticeship Levy provide an opportunity to do this.

The Post-16 Skills Plan set out welcome plans to streamline technical education options for 16-19 year-olds by providing 15 new technical education routes, called 'T-Levels'.[18] Average annual teaching hours on these courses will rise to 900, up from the 600 currently provided to this age group. In order to get these programmes right, extra teaching will require additional funding.

In the 2017 Spring Budget the Chancellor committed additional annual funding allocations of between £115 and £445m, as each of the courses are rolled out. In their 2017 manifesto, the Labour Party similarly proposed a funding increase, by bringing all 16-18 year old programmes in line with baseline funding for 14-16 year olds.

The new Apprenticeship Levy is another opportunity to increase technical skills provision, but there is a danger that expansion comes at the expense of quality. At present, 42 per cent of new apprenticeship standards are at Level 3 and in 2015/16, only 40 per cent of completed apprenticeships were at Level 3 or higher.[19] This should be helped to rise in future. In addition, more apprenticeships should offer a nationally recognised qualification; only around two-thirds do currently.

Importantly, an increased number of higher quality options will not have the desired effect unless people understand how to access them. The government needs to ensure that the push to have more apprenticeships does not produce a plethora of different standards which are difficult for prospective candidates to understand. Worryingly, there is some evidence that this is happening; there have been 172 new apprenticeship standards already approved and a further 218 are in development.

Those sectors facing the most difficult transition should be a priority for the new industrial strategy

This chapter has sketched out the kind of analysis that can start to inform a view about which sectors face the biggest challenges in adjusting to an era of less available and more expensive low paid labour. A recognition of those challenges would help the government refocus its forthcoming industrial strategy on these big shifts at the bottom of the UK labour market.

The draft industrial strategy offers to adopt a sectoral approach with those sectors that choose to come together and ask for one. A more proactive approach would see government identifying those sectors with the least straightforward responses to a changed labour market, be that because of limited scope for automation or the depth of skills shortages, and prioritising those sectors for engagement with the industrial strategy.

The industrial strategy is a good opportunity to ensure that a welcome overarching focus on productivity growth involves boosting output in both high-skill, high-value industries and lower-paid ones that are too often ignored in such visions but are set for the biggest labour market upheaval. Likewise, it would be wrong to place all the emphasis in this area on new technology, when the wider adoption of existing technology is also key. Although UK businesses outperform those in many other developed countries, management skills lag behind firms in countries such as the US, Japan, Germany and Canada,[20] meaning there are gains to be made from the sharing of best practice and a new focus on organisational capabilities.

This chapter has provided an indication of how different sectors may respond to a changing labour market. In the end, the success or otherwise of firms in adjusting to this new world will be shaped by market forces, but government has a role to play in providing guidance as to what the UK's immigration and skills systems will look like in the future and in proactively helping workers and firms adjust to the changes. One area where more action is needed – increasing engagement with the labour market – is the focus of the next chapter.

Summary of recommendations

— Immigration and skills

Recommendation 1 **The government should commission the MAC to model the impact that the end of free movement will have on different sectors and occupations**

Recommendation 2 **The government will probably have to enlarge the shortage occupation list – perhaps almost doubling the number of occupations – but it should make it clear which occupations will move onto the shortage list once freedom of movement ends**

— The domestic skills system

Recommendation 3 **The government should incentivise firms to make use of apprenticeships at Level three and above**

Recommendation 4 **More apprenticeships should offer a nationally recognised qualification**

Recommendation 5 **The government should ensure that apprenticeship standards do not proliferate to the point where they are confusing for firms and prospective apprentices**

— Industrial strategy

Recommendation 6 **The government should proactively approach those sectors that will be most affected by the end of freedom of movement and rising labour costs as part of its industrial strategy rather than waiting for sectors to come forward.**

1 M A Clemens, E G Lewis & H M Postel, "Immigration restrictions as active labour market policy: evidence from the Mexican Bracero Exclusion", *NBER Working Paper 23125*, February 2017

2 C D'Arcy, *Industrial strategies? Exploring responses to the National Living Wage in low-paying sectors*, Resolution Foundation for the Low Pay Commission, December 2016

3 Resolution Foundation survey by ComRes, fieldwork 12th - 26th April 2017

4 J Pessoa & J Van Reenen, "The UK Productivity and Jobs Puzzle: Does the Answer Lie in Labour Market Flexibility?", *LSE Centre for Economic Performance Special Paper* No. 31, June 2013

5 PWC, *Consumer spending prospects and the impact of automation on jobs UK Economic Outlook*, March 2017 "Haldane (2015) cites a Bank of England estimate of around this level for the UK based on their version of the Frey and Osborne analysis. This is also in line with other estimates by Frey and Osborne themselves for the UK"

6 RF analysis of OECD and World Bank data

7 S. Thompson et al., *Boosting Britain's Low-Wage Sectors: a Strategy for Productivity and Growth*, Institute for Public Policy Research, 2016.

8 UK Commission on Employment and Skills, *UKCES Employer Skills Survey 2015*: UK report, January 2016

9 Confederation of British Industry, *The right combination: CBI/Pearson Education and Skills Survey 2016*, July 2016

10 The MAC considers a 'skilled' occupation those that are NQF6+ (graduate level) occupations, although there is no exact proportion of graduates needed in an occupation to make it skilled.

11 Migration Advisory Committee, *Skilled Shortage Sensible: Full review of the recommended shortage occupation lists for the UK and Scotland, a sunset clause and the creative occupations*, February 2013

12 Returns to occupation, claimant count and vacancy postings/unemployment by sought occupation. Testing our approach using current data, we find that our model provides similar results to the MAC's. At the moment, 32 occupations are on the shortage list including artists, actuaries, engineers and highly skilled chefs, and our model identified a majority of these as being in shortage. The fact we didn't identify all the existing shortage occupations likely owes to the fact that the MAC uses more than just its statistical model to identify shortage occupations (as described in Box 1).

13 C D'Arcy, *Industrial strategies? Exploring responses to the National Living Wage in low-paying sectors*, Resolution Foundation for the Low Pay Commission, December 2016

14 RF analysis of ONS, *LFS*

15 UK Commission on Employment and Skills, *UKCES Employer Skills Survey 2015*: UK report, January 2016

16 C D'Arcy & D Finch, *Finding your routes: Non-graduate pathways in the UK's labour market*, Resolution Foundation for the Social Mobility Commission, May 2016

17 K Henehan, *Using the Apprenticeship Levy to tackle the UK's post-16 education divide*, Resolution Foundation, April 2016

18 The 15 routes are scheduled to come online between 2019-20 and 2021-22

19 Department for Education, "Further Education and Skills," Table 7, March 2017

20 N Bloom et al, "Management Practices Across Firms and Countries", *Academy of Management Perspectives*, February 2011