Revealing the Potential Economic Value of Technical and Vocational Training

Addendum: illustrative economic model of the value of getting skills development in the UK right

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Executive summary

Skills are a key driver of economic growth, an important source of competitiveness and a contributor to social mobility and inclusion.

BWB has been asked to produce a model illustrating the cost of getting skills policy in the UK wrong and the extent to which this can be reduced through increasing skills levels.

As such, this report forms an addendum to our earlier full report, entitled *Revealing the Potential Economic Value of Technical and Vocational Training: A commentary on the existing literature.*

The baseline target for this illustration of achievable improvement is to bring the UK into the top quartile of countries in the OECD.

Current cost of the skills mismatch

As a starting point we are basing the model on the schema developed by UKCES. This schema maps the overlap or mismatch between skills supply (the skill level of working age people in the UK, regardless of the skills actually required by their jobs) and skills demand (requirement for skills from employers).

The interaction between supply and demand creates 5 potential scenarios, each of which, other than 'Fully Employed', has costs for individuals, companies/employers, and for the State. This is summarised in the box, right.

We calculate that the total cost of the skills mismatch including unemployment is currently £295bn per year. If we were to exclude unemployment – that is, if unemployment were to remain static – the cost of the mismatch would be £22bn annually.

- Skills shortage vacancies: Demand exceeds supply, so companies have positions they cannot fill. This reduces productive capacity. We estimate that there are currently 209,000 such vacancies, and that each vacancy costs employers £15,062 per year in lost profits. This means lost Corporation Tax receipts for the State of £3,533 a year.
- Skills gaps: Demand exceeds supply, and companies fill vacancies with staff without the appropriate skills for the role, rather than leaving a job empty. We estimate that 1,602,800 people are in a skills gap situation, and that the reduced effectiveness of these employees compared to appropriately skilled employees costs companies £3,464 a year in lost profits per role. This means lost Corporation Tax of £813 per year per role.
- Fully employed: Demand and supply match, so most people should be in a job suitable to their skill level, and most jobs are filled by people with the right skills – we estimate that 28,553,200 people are fully employed. As supply and demand match there are not adverse costs to the employees, the companies, or the State.
- Under employment: Labour supply exceeds demand. People accept jobs for which they are overqualified, because there are not enough jobs at their skill level. We estimate that there are 1,9000,000 in this situation in the UK. By working in roles for which they are overqualified we estimate that each worker loses £3,807 of potential income per year. This means the State loses £1,669 of Income Tax, NICs per person, and in respect of additional in-work benefits.
- Unemployment: Demand for labour is less than supply, so there are individuals who cannot find work. We estimate that there are 10,685,333 in unemployment, each losing out on an average of £13,084 in income (after taking into account the effects of tax and benefits. This is costing the State £11,305 per person per year, in lost tax revenue and in unemployment benefits.



Executive summary

Effect of increasing skills supply

We next look at the extent to which this cost (£295bn per year) would change if the average level of skill in the workforce increased. We look at the effect of improving skills supply to be in-line with the top quartile of OECD countries when ranked by qualification level.

Demand for skills is already largely satisfied. It follows that if the level of skill in the working age population increases without the level of skill required by employers increasing the main effect will be a population shift, moving people out of the fully employed category and into the under employed category – i.e. the same jobs will be available, but now the people that fill them will be over-qualified.

It would appear then that increasing the average skill level in the working age population will actually lead to an increased 'loss' of £8bn per year. This does not mean that the economy would be £8bn smaller, but that there would be more wasted potential through people's skills not being utilised.

Effect of increasing skills demand

The next and final part of the model looks, therefore, at the value of an increase in both skills supply, and – crucially - skills demand, i.e. a shift towards being a higher skilled economy.

We illustrate this by modelling the effect of creating 2 million more highly skilled jobs and 1 million more intermediate skilled jobs (with a reduction of 3 million low skilled jobs).

If we assume that this would reduce the level of under employment and increase the level of full employment, it would also create a structural shift in the types of job in the full employment category, with a higher average skill level required.

According to our illustrative models, this would lead to £22bn in additional value per year through:

- £7.3bn in increased wages for employees
- £8.5bn in increased profitability for companies
- £6.2bn in increased tax and budgetary savings for the State

Section 1: Introduction and case studies



Introduction

Background

Skills are a key driver of economic growth, an important source of competitiveness and a contributor to social mobility and inclusion. Generally, returns from spending on learning and training provision can be considered with respect to:

- benefits to the individual, for example increases in wages and the probability of remaining in employment;
- benefits to the employer, for example greater profitability (also positively affecting society);
- benefits to society, including public health benefits, reduced welfare dependency and higher tax revenues.

BWB has been asked to produce a model quantifying the cost of getting skills policy in the UK wrong and the extent to which this can be reduced through increasing skills levels. This document explains our approach to the model.

In our earlier report *Revealing the Potential Economic Value of Technical and Vocational Training: A commentary on the e existing literature.* we developed a 'top-down' model, which looked at the impact on GVA of skills improvement. This estimated how GVA would grow if the UK improved its position in the OECD rankings of adult education levels to be in the top quartile of OECD countries. We estimated that this would increase GVA by £108bn over 10 years.

We have now also developed a 'bottom up' model, where we look at skills supply and demand, and the financial impact of this on individuals, private sector employers and the State, in terms of productivity (and therefore profitability), wages, taxes, and state expenditure. This Addendum to the earlier report discusses that model.

The benefits of getting skills right can be felt in five distinct areas:

1. Workforce productivity (as measured in wage growth, company profitability, tax receipts, and GVA);

- 2. Tax and fiscal outcomes;
- 3. Welfare benefits; and
- 4. Pensions and savings;
- 5. Funding of training and qualifications.

Our illustrative models cover the first 3 points listed. We have not looked at pensions and savings in detail. The evidence suggests that pay levels are linked to skill levels: higher skilled workers tend to earn more. We assume that if the skill level of workers could be improved they would earn more and would therefore have the potential to save more – this is, however, a complex area and difficult to forecast with any degree of reliability. Similarly, we have not looked at the funding of training and qualifications, as this is beyond the scope of these models.



Intro Current Supply

emand Summary

Introduction



Overview of this report

This document explains how we have developed the models and the key results. The table below outlines the section sin this report. When reading this report, you can use the coloured markers at the top right corner of each page to locate which section you are in.

Section 1: Introduction and case studies	We start with case studies, to illustrate the effect of skills development and deficits in human terms.	Pages 6-12
Section 2: Current cost of the skills mismatch	Before modelling any potential impact we develop the conceptual basis for the model – the skills mismatch.	Pages 13-21
	We then look at the current cost of getting skills wrong. This requires us to look illustratively at:	
	The number of people and companies currently affected by getting skills wrong. This gives us the scale of the issue.	
	The cost per person of not developing and using skills.	
	By multiplying these together we can estimate the total lost opportunity in the UK of getting skills development wrong. We estimate that this is currently £295bn per year, including unemployment, or £22bn per year without.	
Section 3: Effect of increasing skills supply	We then look at the extent to which the cost of the skills mismatch could change if the average skills level of workers increases (improving the skills supply).	Pages 22-27
	We find that, because the skills demand is currently met, improving skills supply on its own is unlikely to have a large effect on the cost of the skills mismatch.	
Section 4: Effect of increasing skills demand	Finally we look at and illustrate the effect on the UK economy of also changing skill demand away from being low-skill focussed.	Pages 28-33
	We find that this is likely to:	
	 Reduce some of the costs of the skills mismatch, and 	
	 Lead to additional growth by making more productive companies. 	
Section 5: Summary	In this section we summarise our findings from our illustrative models.	Pages 34-35



Case Studies - background



The following blended case studies (or pen portraits) reflect three groups of 'typical' individual skills levels in the UK. They are broadly based on the RSA's *Seven portraits of economic security and modern work in the UK*, but are blended into three broader profiles which reflect the fact that citizens – many of whom are employees – can be characterised as having Low, Intermediate or High skills levels.

We've written about three hypothetical people – one at each of these skills levels - to 'tell the story' of their daily lives. In the table following the pen portraits themselves, we have reflected on how the financial implications of skills differ and have drawn out relevant factors that guide our financial modelling, which underpins our assessment of the potential value of a well-functioning skills system.

The table illustrates guided comparisons of how each case study subject's life represents the different types of impact that variations in skills levels have with respect to:

- The individuals themselves, primarily in their role as employees;
- Companies/employers; and
- The UK state reflected in variations in income and expenditure.

At the end of each case study we have provided a brief description of the two differing scenarios and directions each fictitious character could follow. In each case, Scenario 1 is the positive story of that person's life if we as a nation get our skills system 'right', and Scenario 2 represents the implications if the character does not get the skills they need.



Rosa – Low skilled

Background/character

Rosa is 27 and lives with her two young children who are both under the age of 5. They live in a rented two bedroomed flat in Sunderland. Rosa's mother lives nearby and she helps to juggle childcare responsibilities.

Rosa left school early with few qualifications and has been in and out of low paid work ever since. Currently, Rosa is working in the local supermarket and has recently been made shift supervisor. She leaves the flat at 7am to get to work and takes around 1 hour to get there. She works 40 hours a week, with travel time unpaid. She finds it an exhausting and an unrewarding job on the whole. Whilst Rosa wants to progress, the job doesn't offer enough progression opportunities, or flexibility in the way she works. She receives only statutory free childcare, so she needs to balance work with looking after her children.

Rosa values a night away with her best friends every so often, but she felt pressurised to give the children proper birthday parties this year, and combined with the cost of Christmas presents, there was no money left over to pay for even a weekend away. She is feeling exhausted and very dissatisfied.

Implications of skills/lack of skills

Rosa has the basic skill levels needed for first employment and had developed soft skills on the job which helped her to be promoted, but is still relatively under-developed when it comes to skills not directly related to her current role. Her lack of skills had been a barrier to employment in the first place – she took a long time to find a job, but having worked hard to get promotion into her current job, she feels she has reached a dead end. She has struggled to progress and has become trapped in her job.

It is a demanding job. Rosa is managing to get by, but hopes to change careers, and she's been improving her maths skills by doing an online course, but doesn't really know how that will help her. Rosa is recognised for doing her job well - she has been asked to train new recruits but doesn't feel she has the support or skills required to do it successfully. All of this puts pressure on her, and she doesn't really know which direction to go in next, let alone have the energy to make it happen!

She has been given the opportunity to undertake a paid NVQ in health and social care, but Rosa is really worried about how she will do on the course. Being able to think logically, write concisely, clearly and accurately, to interpret, use and to evaluate various types of data – these are all things she doesn't know how to do. She doesn't use these skills in her current job role and is worried that she won't pass the assessments – which is a shame, because she certainly has the temperament and vocation to work in social care. As much as Rosa wants to move on and re-train, she continues to work long hours to maintain her standard of living, but the longer she goes on in her current role, the less she thinks she can keep up the extra effort.

Scenario 1: Rosa gets the skills needed to complete her NVQ and have a successful career in health and social care. Higher wages, secure employment, progression opportunities and working fewer hours with more flexibility. Once in that career, she is able to pay for additional childcare, to find a job closer to home and to support her family better.

Scenario 2: She fails to get the skills and remains in unrewarding work. In reality she has little job security and no safety net should she lose her job. Over time the stress starts to tell on her health and she visits the GP far more often than she is used to. As the children get older she finds it harder to find money for all the things she wants to buy them – giving them the support to get a good start in life and keep up with what their friends are doing. Her mother won't be around to help forever and Rosa is terrified of anything going wrong – she simply can't afford to be out of work.





Sammi – Intermediate skilled



Background/character

Sammi is 35. She is married and has two children, who are both currently in secondary school. The four all live together in a 2 bedroomed terraced house. Life is very hectic for her and her husband. He works for the fire service and they live out in a suburban area, which requires quite a bit of driving to work and to the local town centre and school, which the children attend.

Sammi works full-time in the public sector, as a debt management officer. Ideally she'd work a couple of days a week from home – this would really help her with looking after the house and family, especially when her husband is on night shifts, and would save on travelling to work cost. She hasn't managed to negotiate the flexible working arrangement in her current job though.

Sammi and her husband rent their home. They'd like to buy one day, but they don't have enough savings to put down a deposit. Sammi is hoping that she can find a job that gives her a bit more money, and would allow her to work flexibly from home. That way, she could save more to buy a home through the government's Help to Buy scheme.

Their current property is too small and Sammi hates the fact that the neighbouring houses in the terrace feel like they're 'on top of each other'. The house needs renovating inside and the landlord doesn't do much to keep it in good repair or do things like treat the damp problem in the bedroom. The family all get ill regularly and Sammi has had to take unpaid leave recently, whilst the children are being kept off school, adding to the childcare burden for Sammi and her husband. On days that neither of them can stay off work, they have to pay out for a childminder if one of the children is ill – and it all eats into the house deposit fund.

Implications of skills/lack of skills

Sammi's line manager left a few months ago and Sammi has taken over the majority of the tasks her manager was responsible for. She's extremely worried because, whilst she thinks she might eventually enjoy the challenge she's had no training in areas such as management, cost analysis and leading on procurement contracts. She feels she is completely underqualified for the role and is getting no support. Although she is doing much more, Sammi isn't getting any more money. The Local Authority is struggling to recruit a replacement for her manager because there are few people out there with the skill set required and experience needed.

Sammi has had enough and is looking for a new job which suits her skills better, and offers good career pathways and flexible working. Since she started work, the job market has moved on, and there are few opportunities out there calling for her particular blend of qualifications and experience. It's been a while since she was applying for jobs, and everything seems to be done online now. Sammi feels at a disadvantage and out of touch with current technology and methods of finding new work.

It is important to Sammi that she is a good role model for her children. She wants them to learn and thrive in the world of work. Sammi believes that being successful and happy in her own work will provide the right support for her children, and give them a better chance at flourishing in the years to come.

Scenario 1: Sammi gets the skills needed to do her manager's job successfully, and is promoted to the position on a permanent basis through proper channels. Or she goes elsewhere and receives the training needed to upskill into a new role. Her productivity levels and salary will both increase and she will be able to do her job successfully, with much reduced levels of stress at home and the flexibility to juggle home and work life.

Scenario 2: She continues to cover her manager's job without gaining the skills and the support needed to do it well. The result is continued worry and unproductiveness at work. She could continue to struggle on in the role, or leave voluntarily and become unemployed – or, worse case scenario, be 'let go' because she isn't doing a good job. There will be no salary increase and no added flexibility, and Sammi's mental health is likely to suffer. The family is unlikely to move out of their rented home and saving for their and the children's futures seems a long way off.



Ali – High skilled

Background/character

Ali is 55. He is a car manufacturer by trade and has worked in the automotive industry for his entire career. It is a physically demanding and highly skilled job. He's now a grandfather who enjoys spoiling his grandchildren and spending time with them.

Ali relied on his salary to get by and to pay his mortgage, and regularly dips into his fast-dwindling savings for holidays and for supporting his two children and their families. He's made some difficult decisions in his career. When Ali was midway through his career and hit his early 50s, a couple of his colleagues made the bold choice to remortgage their properties to free up equity, which they used to pay to retrain for a less physically intensive job. They spent the next couple of years studying. They saw less of their families during that time, but thought it would pay off in the long run. Since re-skilling, their roles within the company have changed and they are now working in the manufacturer's head office as part of the management team.

Implications of skills/lack of skills

Even though Ali was always valued in his industry for being highly skilled and was paid accordingly, he failed to foresee the challenges of future work in the car manufacturing industry, especially the changes in manual tasks being replaced by more automated and robotic labour (making manual roles more scarce and competitive). He also failed to see the writing on the wall quite early on when it came to State Pension Age being raised. Ali now knows he'll be working for years longer than he'd originally expected. Although deep down he knew that in later years the work he was doing would be too demanding for him – both physically and technologically, he failed to act whilst he could, and the consequences are high.

Ali is now unable to retrain because he doesn't have the savings or equity to pay for it any more. It is very time consuming and demanding and he doesn't have the capacity to commit to learning. Ali has recently had to leave the industry involuntarily, and has taken up a job in an accident repair specialist company carrying out much more junior and less skilled vehicle repairs, for a much smaller salary compared to the one he enjoyed before. The knock-on effects are that it's reduced his ability to replenish his savings, or to increase his pension pot.

Ali's colleagues used the savings they built up whilst receiving a high wage and used them to fund their training and prepare themselves for a career change. Now they are enjoying their new jobs and they look positively towards the future. True, they have less in the pension pot now, and their families won't get quite as much in their will, but Ali's colleagues are pleased that they had a chance at a second career this – and that they were able to develop the skills needed to break into it.



Scenario 1: Ali manages to retrain within the same sector he is valued and experienced in, but in a role that is better adapted to his changing capabilities. Re-training will ensure career longevity and a higher salary and he will be able to re-build savings and pension pot to some extent. He will once more feel valued and find work rewarding.

Scenario 2: Ali remains in a role which is below his skill set and isn't making use of his potential. His productivity will be lower and salary less than he is capable of earning. Others who would value his role as a stepping stone will be prevented from moving into his role. Ali's new work is still quite physical and he can see a time when he can no longer do that well. He dreads the thought of being put out on the scrapheap again. He comes home each night tired and dispirited and even playing with grandchildren has lost some of its shine.



Financial impacts



On the following page, we have reflected on how the financial implications of skills differ, including some elements that we have included in our model, which underpins our assessment of the potential value of a well-functioning skills system.

The table assumes that the fictitious characters in our case studies have developed according to our Scenario 1, in each case - broadly meaning that they are adequately skilled, trained and prepared for work, and are in a role which matches their skills and experience.

The analysis shows the financial implications of getting skills 'right' in Low, Intermediate and High skilled work, illustrated in each case by one of our case study characters. The implications are divided into their effects on individuals, on employers and on the wider UK state or economy.



Financial impacts



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	Low Skilled – Rosa	Intermediate Skilled – Sammi	High Skilled - Ali
Individuals/ employees Higher wages because on more so terms of employment and open to p Lower welfare benefit costs becauvage Less unpaid sick leave as more p	Higher wages because on more secure and consistent	Increased personal pension pot and savings if employees	Higher wages as in a more specialist role
	terms of employment and open to progression opportunities	pension plan.	Bigger pension and savings from prolonged career
	Lower welfare benefit costs because receiving a higher wage Less unpaid sick leave as more productive at work	More interest recouped on their savings if they build up their savings and aren't needing to use it as often to retrain and upskill	More interest recouped on their savings if they build up their savings and aren't needing to use it as often to retrain and upskill the
	meaning better health and wellbeing as a result Less likely to get into debt and suffer rent arrears because better able to afford rent or mortgage payment	Less unpaid sick leave as more productive at work meaning better health and wellbeing as a result	
	Better savings if they are receiving higher wages they can start saving for a rainy day fund or build up pension	Increased likelihood of owning own home if able to afford their own homes	
start saving for a rainy day fund contributions	contributions	Reduced medical costs if their own home is less cramped and in a good state of repair; less chance of getting ill because of better physical and mental wellbeing as a result.	
Companies/ employers	Increased profit margins if staff retention is higher because workers are more productive at work and less inclined to move	Increased profit margins if staff skilled enough to do their jobs efficiently	Increased profit for businesses by having employees with the skills to do their jobs efficiently
	Increased training costs if workers require training to upskill and progress	Reduced recruitment costs because of balanced supply and demand and can recruit internally for skills and experience	Saving on training costs if retraining internal high skilled employees in other roles, less induction costs and streamlined training because knowledge and experience is benchmarked
		Increased training costs to upskill employees	Reduced redundancy costs if keeping people on but they are retraining into other roles within the organisation
UK state	Lower welfare costs from DWP budget as individuals receiving more secure and representative salary and in work benefits	Higher Corporation Tax if companies are more profitable due to intermediate skilled employees trained and skilled up to do their job	Higher Corporation Tax if companies are more profitable due to high skilled employees being in the right roles for their skill set
	Higher income tax and National Insurance as employees on higher and steadier wages	Higher income tax and National Insurance as employees on higher and steadier wages	Lower welfare costs from DWP budget as individuals receiving more secure and representative salary and in work benefits
	Higher Corporation Tax as companies more profitable	Higher VAT if companies are providing better value products and services due to employees training and upskilling and therefore progressing	Higher income tax and national insurance as employees will be on more money
		Student loan repayments bigger if students are progressing more in their careers and are getting into employment quicker	Increased local economy spending because people will have more money to spend on the high street

Section 2: Current cost of the skills mismatch



Overview of this section



With these illustrations in mind, we turn to the quantifying the cost of getting skills 'wrong'. We start by explaining the conceptual basis for the models – the concept of the skills mismatch.

We then estimate the current cost of the skills mismatch - including:

- The current scale of the mismatch
- The cost per person of the mismatch
- The total estimated cost of the mismatch, given the scale and cost per person.



Conceptual basis of model



As a starting point we are basing the model on the schema developed by UKCES¹, and which we have further developed in chapter 7 of our report *Revealing the Potential Economic Value of Technical and Vocational Training: A Commentary on the Existing Literature*. This schema maps the overlap or mismatch between skills supply (the skill level of working age people in the UK, regardless of the skills actually required by their jobs) and skills demand (requirement for skills from employers). As summarised in the table, below, the interaction between supply and demand creates 5 potential scenarios. Each of these scenarios, other than 'Fully Employed', has costs for individuals, companies/employers, and for the State.



At its most basic, missing the opportunity to develop workplace skills fully' means there being any scenario other than 'Fully Employed', and grasping that opportunity means getting skills supply and demand to match up. For the purposes of our models we have developed a hypothetical ideal scenario, where the ideal level of skills supply is set high enough to move the UK into the top quartile of OECD skills rankings, and where skills demand matches this. Our main report has already illustrated a potential increase in GVA of £108bn over 10 years if this were to be achieved.



Scale of the skills mismatch



We can estimate the current scale of each scenario from survey data. Our estimates and the supporting evidence is outlined below:

Skills shortage	209,000	We estimate that in a year there will be roughly 209,000 vacancies that cannot be filled due to skills shortages.
vacancies	roles	The 2013 UKCES Employer Skills Survey found approximately 146,000 skill shortage vacancies. The UK Skills Mix: Current Trends and Future Needs found that in 2015, there were 930,000 reported job vacancies. The proportion of these that were hard to fill because of a skill shortage was 23% - resulting in around 209,000 skill shortage vacancies.
		UKCES (2014) found that 4% of employers have skills shortages. Given 5.7m business in the UK this means at least 228,000 shortages (assuming 1 vacancy per business affected) - although some would fill the vacancy with an under-skilled candidate leading to a skills gap scenario. Similarly, the Edge Foundation report in June 2018 found that "nine out of ten UK employers struggle to recruit" due to skills shortages in the market, and that 5% of employers reported having vacancies but not having recruited in the last 12 months, which may be indicative of skills shortage vacancies. This would mean a minimum of 285,000 skills shortage vacancies. The roles that are hardest to recruit for are higher level management and leadership roles, indicating a sense that there is a high skill level shortage in particular.
		This range of data suggests the number of skills shortage vacancies is 146,000-285,000 vacancies. We have used the UK Skills Mix estimate of 209,000 vacancies.
Skills gaps	1,602,800	We estimate that there are around 1,602,800 people in the UK working in a role for which they lack some of the required skills.
people		UKCES evidence suggests that 15% of employers face skills gaps, and that 5% of all employees are not fully proficient in their roles. This equates to 855,000 businesses with a skills gap (given 5.7m businesses). 5% of employees would be 1,602,800 (given a workforce of 30m). This would mean just under two under-skilled employees per effected business.
		Analysis by McKinsey found that 10% of UK workers had a level of proficiency lower than is required for their role, equating to 3,010,160 people with a skills gap.
		Open University Business Barometer, quoted in the Edge Foundation, found that 53% of employers with a skills shortage ended up hiring at a lower level and using training to develop their skills. Given our estimate of 146,000-285,000 vacancies, this would suggest a much lower number of skills gaps – perhaps as low as 73,000 people with a skills gap.
		This gives a wide range of possible figures – from 73,000 to 3,010,160. This disparity is likely to be partly due to different definitions as to what makes someone under-qualified for a role. We have used the UKCES figure because this fits with our underlying conceptual model.



Scale of the skills mismatch



28,553,200 We can estimate the total number of people in employment from ONS data. We have assumed anyone in employment and Full employment not in Under employment (below) or Skill gap is in Full employment. people Under 1,900,000 The Government Office for Science (quoted in Universities UK) found that, "1 in 3 employers, however, have staff whose skills and qualifications are both above those required for their job, and are thus 'underused'". The Universities UK's report employment people notes that skill shortages "vary considerably by sector and occupation", with the highest number of SSVs in the gas, electricity and water industries (36%), followed by 34% in construction and 30% in manufacturing. In 2017 there were 5.7m businesses in the UK (House of Commons Library) - over 99% were SMEs, and 96% were micro businesses (0-9 people employed). If we assume1 person per business with underutilised skills, as a conservative assumption, this gives 1,900,000 people. Recent analysis by McKinsey states that, relative to its OECD peers, the United Kingdom has a high rate of mismatch between workers' existing skills and those required for their job. Overall, 24% of workers have mismatched skills, 12% having a level of proficiency higher than is required or having important skills that are not being utilised. This would give 3,612,192 people. PIAAC indicates that around 30% of workers in England and Northern Ireland possess a qualification which exceeds the level required for someone to be recruited to their job, with this being the second highest figure out of 22 OCED countries, exceeded only by Japan. (OECD, 2013). Unemployment 10,685,333 The number of people in unemployment is taken from ONS data. people



The cost per person of the skills mismatch



The model explores the costs per person/role in a company under each scenario. Once we have estimated the cost per person/role in each scenario we can multiply this by the estimated number of people/roles affected to give the total estimated opportunity. This table summarises the average cost per person/role of each scenario (in comparison to a Full Employment/ skills supply and demand matching). The key assumptions underlying these figures are summarised on the next page.

	Skills shortage vacancy	Skills gap	Fully employed	Under employed	Unemployment
Individuals / employees	N/A	N/A	N/A	£3,807 income lost per year of under employment (net of tax and benefits)	£13,084 income lost per year of unemployment (net of tax and benefits)
Companies / employers	£15,062 profit lost annually per vacancy	£3,464 profit lost per skills gap	N/A	N/A	N/A
UK state - income	£3,533 less of Corporation Tax paid in a year per vacancy	£813 less of Corporation Tax paid in a year per skill gap	N/A	£1,258 less Income Tax and employee NICs per person in under employment	£5,384 less Income Tax and employee NICs per person in unemployment
UK state - expenditure	N/A	N/A	N/A	£411 more payed in Universal Credit per person in under employment	£5,921 more payed in Universal Credit per person unemployed



The cost of the skills mismatch



This table outlines the main costs we have modelled to produce the figures on the previous page, and the reasoning behind this. The columns, right, shows which mismatch scenarios are relevant to which stakeholders.

Under employed Skills shortage Fully employed Unemployment Skills gap vacancy When compared to the Fully Employed scenario, each scenario has: Potential costs to individuals/employees The main cost is 'missing' income for individuals who are unemployed or in roles with lower skills requirements than possessed by that person. The underlying assumption here is that generally jobs requiring higher skill levels are better remunerated. Someone with, for example, High skills but in an Intermediate skilled job (under employment) is effectively losing out on the income premium for the Higher skill job they could be doing if a role was available. This impacts on the individual's ability to save and to build up a pension pot - although these longer term effects have not been modelled. N/A N/A N/A Where someone is unemployed they are effectively missing out on the full salary of a job with their skill level. The average full time salary in the UK is currently £26,104 per year. Estimates for the level of the pay premium for High skilled jobs compared to Intermediate skill vary from 1.23x to 1.48x. Less research has looked at the Intermediate skill premium compared to Low skilled jobs, but one study found a premium of 1.1x. The 'lost' income has to be adjusted to take into account the effects of taxes and benefits available for unemployed and low paid people. Potential costs to companies/the employer Where employers cannot find employees with appropriate skills for a role (skills shortage vacancy) key production processes and capacity will be lost compared to the company's potential. This results in 'lost' profit. There could also be additional costs related to recruitment and training, although these have not been modelled. N/A N/A N/A UK companies make over £400m per year in profits, and around 27m people working in the private sector. We estimate that the average profit a company can make per employee is £15k per year, with profit per employee generally being higher where the employee skill is higher. Where companies choose to mitigate vacancies by filling the role with an under skilled person (skills gap) we assume this would still reduce profits compared to potential but to a lesser extent.



The cost of the skills mismatch



	Skills shortage vacancy	Skills gap	Fully employed	Under employed	Unemployment	
 Potential lost income for the State Where companies are less profitable due to skills shortage vacancies and skills gaps, the State 'loses' the Corporation Tax that would have been paid on the 'lost' profit. Where individuals lose out on potential income through under employment and unemployment the State loses the Income Tax and NICs contributions the individual would have made on the income. 	\checkmark	\checkmark	N/A	\checkmark	\checkmark	
 Potential costs to the State The State provides income through benefits such as Universal Credit for people who are unemployed or who are on low incomes. The cost to the State of unemployment is the cost of these benefits. The cost to the State of underemployment is the value of the in-work benefits that the State would pay for anyone in a low paying (and therefore probably low skill) job who has the skill level to be in a higher paying job. 	N/A	N/A	N/A	\checkmark	\checkmark	



Total illustrative cost of the skills mismatch



This table summarises the total cost per scenario in a given year, based on the estimates of the current skills mismatch, and our estimates of the costs per person.

	Skills shortage vacancy	Skills gap	Fully employed	Under employed	Unemployment	Total
Individuals / employees	N/A	N/A	N/A	£7bn in lost net income annually	£151bn in lost net income annually	£159bn lost annually
Companies / employers	£4bn in lost profits annually	£4bn in lost profits annually	N/A	N/A	N/A	£8bn lost annually
UK state - income	£911m in lost Corporation Tax annually	£919m in lost Corporation Tax annually	N/A	£3bn less Income Tax and employee NICs lost annually	£58bn less Income Tax and employee NICs lost annually	£64bn lost annually
UK state - expenditure	N/A	N/A	N/A	£782m more payed in Universal Credit annually	£64bn more payed in Universal Credit annually	£64bn lost annually
Total	£5bn lost annually	£5bn lost annually	N/A	£11bn lost annually	£273bn lost annually	£295bn lost annually

As shown in this grid, our models suggest that the current cost of the skills mismatch is £295bn. Most of this arises due to the cost of people being unemployed. Excluding the element of unemployed individuals finding work leaves £22bn per annum of opportunity.



Section 3: Effect of increasing skills supply



Overview of this section

Intro Current Suppiy Bemand Summary

As shown on the previous page, we estimate that nearly £300bn is 'lost' annually through the skills supply/demand mismatch, or £22bn annually if we assume no reduction in unemployment. But even with improved skills supply we do not believe all of this value could be recovered.

The majority of this value is the income 'lost' to individuals by not being in employment; employment levels in the UK are at an all-time high, and it is unlikely that employment levels can rise much higher in the short-medium term without wage growth stagnating further.

In the next section of our model we have estimated the effect that increasing skills supply could have.

We:

- Define our 'target' skills supply level (see scenario B: getting skills supply right, on the next page) compared the current level.
- Estimate the effect this improvement in supply would have on the 5 scenarios.

A key point to grasp when considering the potential cost of getting skills 'wrong' – or, put another way, the potential gain to be had in getting skills 'right' – is the fundamental belief that addressing one side of the Supply/Demand balance without addressing the other will not solve the problem, or realise the UK's skills potential. Page 29 explains this in more detail.



What does 'getting skills right' mean?



Skills are capabilities and expertise in a particular occupation or activity. Skills are hard to measure in an internationally comparable way, with qualification levels usually used as a proxy. Data collated by the OECD is commonly used in academic work in this area. The OECD collects data on countries according to the proportions of the 25-64 year old population with low-level skills (below upper secondary education as their highest qualification level), intermediate level skills (upper secondary) and high-level skills (tertiary).

Scenario A: Getting skills wrong (the current situation)

We have assumed that getting skills 'wrong' means skills supply and demand staying at current levels, i.e. the levels that create the current skills mismatch.

Skills supply

Highest skill level	% of working age population	Number of people
High	46%	20,000,000
Intermediate	35%	15,000,000
Low	19%	8,000,000

These % figures are the 2017 figures for Great Britain.

Skills demand

Current demand data is taken from research by Universities UK.

Highest skill level	% of jobs	Number of jobs
High	37%	12,000,000
Intermediate	46%	15,000,000
Low	17%	5,000,000

Scenario B: Getting skills supply right

We have assumed that getting skills supply 'right' means the average skill level of the workforce increasing.

Skills supply

Highest skill level	% of working age population	Number of people
High	46%	20,000,000
Intermediate	42%	18,000,000
Low	12%	5,000,000

We have assumed the number of High skilled people needs to rise to the top quartile of OECD countries when ranked by % of High skilled adults (ranked high to low).

We have assumed the number of Low skilled people needs to fall to the top quartile of OECD countries when ranked by % of Low skilled adults (ranked low to high).

Skills demand

Demand data is taken from research by Universities UK. In Scenario B we are assuming that skills demand stays at current levels.



Skills mismatch – effect of increased skill level



A. Getting skills wrong

VS. B. Getting skills *supply* right



Skills shortage vacancies and skills gaps

Skills vacancies and skills gaps are likely to be for High and Medium skilled jobs. Skills vacancies and gaps are unlikely to arise for Low skilled jobs as Low skill jobs have fewer skill/experience requirements. As there is already an oversupply of High and Medium skilled jobs, the current level of vacancies and skills gaps are likely to be a result of either shortages of specific skills, or other limitations such as geographic location (i.e. while there is adequate supply on a national level in reality it is not practical for people to travel long distances to work). We therefore do not believe that reducing the level of skills supply would have an effect on skills vacancies and only a small effect on the level of skills gaps.

Unemployment

Currently unemployment seems to mainly be a result of skills oversupply. Therefore increasing skills levels is unlikely to have a large effect on unemployment levels – to reduce this the number of jobs available (demand) needs to increase.

Full employment and under employment

The UK currently has very low unemployment levels, and *employers* seem to generally be satisfied with the level of skills supply. Therefore if the skills demand from employers stays at current levels, an increase in skill levels amongst the workforce is also likely to result in more people who are underemployed, and a reduction in the number of people fully employed – i.e. low skill jobs that would have previously been filled by Low skilled workers will instead be filled by Intermediate skilled workers.



Cost of skills mismatch – effect of increased skill supply

This diagram illustrates what we might expect to be the effect of increasing skills supply compared to current levels (assuming skills demand stays at current levels).

The reduction in skills shortage vacancies and skills gaps should mean greater profitability for some companies, leading to higher Corporation Tax income for the State.

The shifting of people from full employment to underemployment will mean more people who are potentially losing out on higher income received by other people at their skill level. Note that this is *not* a reduction in income compared to current levels, but more people with the *potential* to earn higher wages who will not do so. This also means more lost *potential* Income Tax and NICs.

Number of people/roles per scenario: Reduce Reduce No change Increase No change $\sqrt{2}$ Skills shortage Skills gaps Full Unemployment Under vacancies employment employment **Financial effects:** More people Individuals / losing out on N/A N/A N/A N/A employees higher earnings Fewer **Companies /** N/A companies N/A N/A N/A employers losing profit Reduced Increased Corporation Income Tax **UK state - income** N/A N/A N/A and NICs Tax revenue Increased UK state -N/A N/A N/A Universal N/A expenditure Credit Number of people in this scenario decreases - but no

cost to this

Current

Bates Wells Braithwaite Impact Advisory

Cost of skills mismatch – effect of increased skill supply

The diagram, right, shows our estimate of the effect compared to current levels of increasing the skills supply.

We estimate that increasing the average skill level in the working age population will actually lead to an increased 'loss' of £8bn per year. This does not mean that the economy would be £8bn smaller, but that there would be more wasted potential through people's skills not being utilised.

It should also be noted that the increase in skills supply is likely to arise through increased spending on skills, whether by the State , employers, or self-funded by individuals – and yet we estimate that there will be no greater 'return' from skills funding than achieved currently.

Number of people/roles per scenario:



Number of people in this scenario decreases – but no cost to this



Section 4: Effect of increasing skills demand



Low skill equilibrium and the need for increased skill demand

The final part of the model looks at the value of an increase in both skills supply, but crucially also increasing *skills demand*, i.e. a shift towards being a higher skilled economy.

We look at:

- Types of additional costs/savings
- The assumed target demand level
- The expected effect on the scale of the skills mismatch
- The effect on the total cost if the mismatch

The previous sections have been about creating a model to estimate the cost of the mismatch between skills supply and skills demand. The assumption underpinning this was that reducing the level of skills mismatch, through increasing the level of skills supply, would be the route to economic growth. However, in reality the picture is more complex. The UK currently has a good match between skills supply and demand – but much of the demand and supply is for low skilled labour. In our report *Revealing the Potential Economic Value of Technical and Vocational Training: a Commentary on the Existing Literature* we called this the 'low skill equilibrium'. Companies reliant on low skilled labour are generally adding less 'value' through their production process, i.e. are less productive. Compared to companies with reliant on higher skilled labour, they are likely to have low profit margins, and therefore be paying relatively low levels of Corporation Tax. The economic impacts are summarised in the grid, right.

Because of this low average demand and the current oversupply of labour, increasing the level of skill in workforce on its own will not increase growth. Employers need to be encouraged to change their commercial strategies towards strategies that utilise more highly skilled labour to add more value in their production processes.

	Fully employed – low skill role	Under employed
Individuals / employees	Low earnings and little chance of career progression - reduces ability to save eg for housing, and for pensions	Low earnings and little chance of career progression - reduces ability to save eg for housing, and for pensions
Companies / employers	Low profit margins as low value added product strategy	Low profit margins as low value added product strategy compared to the skill in its workforce
	Reduced Corporation Tax if companies less profitable	Reduced Corporation Tax if companies less profitable
UK state - income	Low VAT as UK products low value	Low Income Tax and National Insurance as employees on low wages
	Low Income Tax and National Insurance as employees on low wages	Reduced Student Loan repayments
UK state -	Higher Working Tax Credit and Housing Benefit payments (part of Universal Credit) as individuals on low wages	Higher Working Tax Credit and Housing Benefit payments (part of Universal Credit) as individuals on low wages
experiature	Potentially higher costs in longer term if aging population has low personal savings	Potentially higher costs in longer term if aging population has low personal savings



Current

Intro

summary

Potential to increase skills demand



Scenario C: Getting demand and supply right

For this model we assumed that the average level of skill required by employers (skills demand) increases, i.e. the UK economy shifts further towards being a high skilled economy. We have also summarised the supply and demand estimates used in the Current scenario (A) and increased Supply scenario (B) on the following page.

Skills supply

Highest skill level	% of working age population	Number of people
High	46%	20,000,000
Intermediate	42%	18,000,000
Low	12%	5,000,000

We have assumed the Target level of skills supply (see scenario B on page 24).

Skills demand

Highest skill level	% of jobs	Number of jobs
High	43%	14,000,000
Intermediate	49%	16,000,000
Low	8%	3,000,000

Our demand assumptions are based on increasing demand profiles in line with our desired position in OECD rankings (top quartile). We have therefore assumed that demand for High skilled labour would increase by to a level to accommodate the High skilled workers currently in Intermediate skilled jobs, i.e. 1.9m more jobs. This is a 16% increase.

We have assumed that demand for Intermediate skilled labour would increase by to a level to accommodate the Intermediate skilled workers currently in Low skilled jobs, taking into account the Intermediate skilled jobs freed up by High skilled employees vacating them for High skilled jobs. This is an increase of 900,000 jobs or a 6% increase.

We have assumed the same total employment levels as currently as employment rates are already very high. We have therefore assumed a 51% reduction in the number of Low skilled jobs to compensate for the other increases.



Potential to increase skills demand



For comparison we have summarised the assumed level of skills supply and demand in each scenario:

Scenario A: Getting skills wrong – the current situation

Skills supply

Highest skill level	% of working age population	Number of people	
High	46%	20,000,000	
Intermediate	35%	15,000,000	
Low	19%	8,000,000	

Skills demand

% of jobs	Number of jobs	
37%	12,000,000	
46%	15,000,000	
17%	5,000,000	
	% of jobs 37% 46% 17%	

Scenario B: Getting skills supply right

Skills supply

Highest skill level	% of working age population	Number of people
High	46%	20,000,000
Intermediate	42%	18,000,000
Low	12%	5,000,000

Skills demand

Highest skill level	% of jobs	Number of jobs	
High	37%	12,000,000	
Intermediate	46%	15,000,000	
Low	17%	5,000,000	

Scenario C: Getting *demand* and supply right

Skills supply

Highest skill level	% of working age population	Number of people	
High	46%	20,000,000	
Intermediate	42%	18,000,000	
Low	12%	5,000,000	

Skills demand

Highest skill level	% of jobs	Number of jobs	
High	43%	14,000,000	
Intermediate	49%	16,000,000	
Low	8%	3,000,000	



Skills mismatch – effect of increased skill demand





We estimate that an increase in the average level of skill required by employers would lead to:

- No change in the number of Skills Shortage Vacancies or in the level of Unemployment
- A reduction in skills gaps, as per the Target skills supply position (B)
- A reduction in Underemployment and an increase in Full Employment as the average skill level required for a job increases.

In this version of the model the economy benefits from the effects of reducing mismatches (as per earlier discussion). In addition, it also assumes that the increase in the average skill level required for a job is driven by companies switching to more productive strategies, and therefore having higher profits. We have included this increase in profitability (and the resultant increase in Corporation Tax) in the model.



Change in costs

Intro Current Supply Demand Summary

A. Mismatched skills – the current situation

Vs.

C. Getting demand and supply right

	Skills shortage vacancy	Skills gap	Fully employed (low skill)	Under employed	Unemployment	Total
Individuals / employees	N/A	N/A	N/A	£7bn more in net income annually from reducing Under- employment	N/A	£7bn saved/earned annually
Companies / employers	N/A	£276m more profit annually from reducing Skills Gap	£8bn higher profits annually due to higher skilled product strategy	N/A	N/A	£8bn saved/earned annually
UK state - income	N/A	£65m more in Corporation Tax annually from reducing Skills Gap	£2bn higher Corporation Tax annually	£3bn more paid in Income Tax and employee NICs annually from reducing Under- employment	N/A	£5bn saved/earned annually
UK state - expenditure	N/A	N/A	N/A	£782m less payed in Universal Credit annually from reducing Under- employment	N/A	£782m saved/earned annually
Total	N/A	£341m saved/earned annually	£10bn more profit and tax annually	£11bn saved/earned annually	N/A	£22bn saved/earned annually



Section 5: Summary



Summary

In *Revealing the Potential Economic Value of Technical and Vocational Training: A Commentary on the Existing Literature* we estimated that improving skills such that the UK is in the top quartile of the OECD rankings would lead to an additional £108bn in GVA over 10 years.

In this report we have outlined our 'bottom' up approach to modelling where we looked at the effect of skills on employees' wages, employer profitability, and the State. We used the concept of a mismatch between skills supply (the skill levels of working age people in the UK, regardless of the skills actually required by their jobs) and skills demand (requirement for skills from employers). Our illustrative models suggest that the current level of skills mismatch costs the UK £295bn a year (discussed in section 2 of this report). We then looked at the extent to which this cost could be reduced.

The paradox of the UK economy is that productivity growth in the UK has for a long time lagged behind many of our competitors, whilst at the same time unemployment in the UK is currently at a record low, and (whilst there are significant skills shortages in some sectors) in general the evidence suggests that employers are satisfied with the level of skills supply in the UK. We estimate that 94% of jobs in the UK are filled by someone appropriately qualified *or overqualified* for that role. This suggests that many UK companies are focussing on low profit, low value-added strategies that do not require highly qualified employees. We therefore estimate that improving the average skill level of the UK workforce will not on its own lead to a large growth in the economy. In fact it may lead to an increase in the 'cost' of the skills mismatch. This is shown in section 3 of this report.

A reduction in the cost of the skills mismatch and an increase in economic growth can only come from companies using the increased supply of more highly qualified labour to drive more complex business processes that add more value for the customer, and which give companies higher profit margins.

In section 4 of this report we estimate that if the average skill level of the UK workforce increased to be level with the OECD top quartile, and the average skill level required and utilised by employers increased (2 million more highly skilled jobs created, and 1 million more intermediate skilled jobs) this would lead to £22bn in additional value per year through:

- £7.3bn in increased wages for employees
- £8.5bn in increased profitability for companies
- £6.2bn in increased tax and budgetary savings for the State

Intro Current Supply Demand Summary

Bates Wells Braithwaite: Impact & Advisory

BWB's Advisory & Impact department works co-productively with social good organisations to help them identify opportunities for social impact, and develop pragmatic impact measurement frameworks for integrated reporting. We also specialise in conducting impact studies to evaluate, value and articulate social outcomes that organisations achieve through their work.

Our multi-disciplinary team helps organisations respond to today's challenging environment by supporting with; strategic insight and development, governance, social investment, financial advisory, and major transactions – such as mergers and acquisitions.

The team is made up of strategists, researchers, financial modellers and accountants, all with a breadth of experience across the third sector, local government and private sector - and with the emergent fourth sector.

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