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BRIEFING

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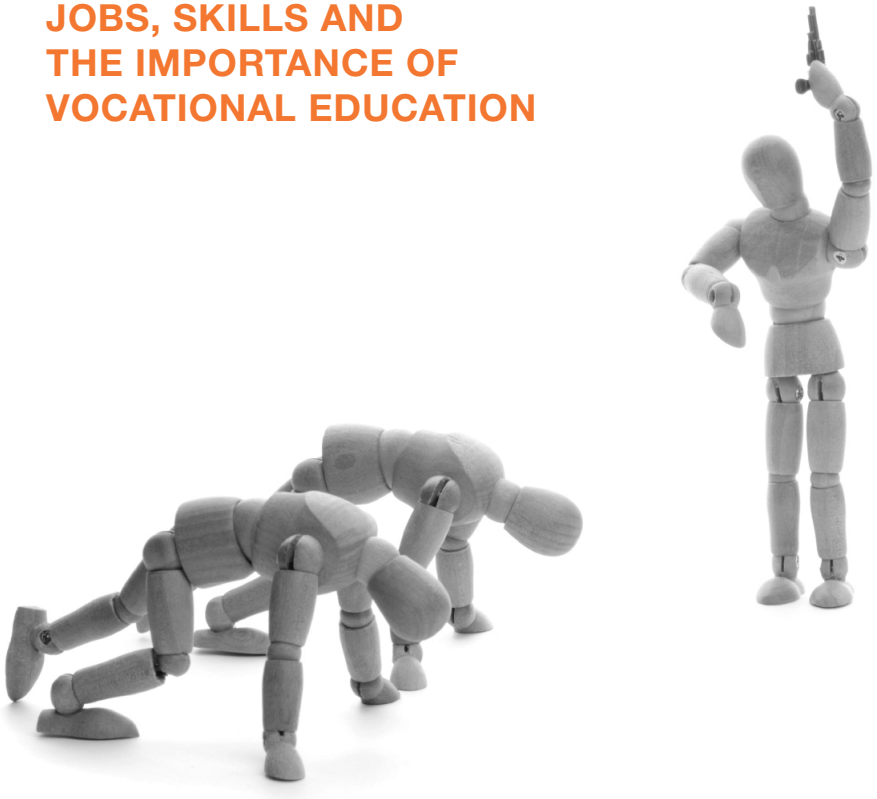
WINNING THE GLOBAL RACE?

JOBS, SKILLS AND THE IMPORTANCE OF VOCATIONAL EDUCATION



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SUMMARY

It has become widely accepted that the UK economy is becoming more professionalised. This has led to a focus by successive governments on expanding higher education, with relatively little attention paid to vocational education and training, or the way in which firms demand and use skills in the workplace.

This briefing paper analyses the latest projections on the changing shape of the jobs market in the UK. It presents a more complex picture of the skills needs of our economy. In particular it shows that:

- Business growth will indeed lead to the creation of more professional jobs.
- The number of jobs created as a result of people retiring or leaving the workforce will dwarf the number of jobs created as a result of business growth, and will be in very different occupations.
- In absolute terms there will continue to be a large number of jobs created in the bottom half of the occupational ladder. Between 2012 and 2022 just over one-third of all jobs will be created in high-skilled occupations, with the remainder created in medium and low-skilled occupations.
- A large number of jobs will be created in sectors that tend to rely on vocational education and qualifications. For example, there is set to be an additional 3.6 million jobs in medium-skilled occupations by 2022 – including associate professionals in health care, skilled trades and public service professionals – all of which employ large numbers of people with level-3 and level-4 vocational qualifications or apprenticeships.
- The creation of high-skilled jobs has not kept pace with the very rapid increase in education and qualifications. A fifth of all workers in low-skilled occupations have a higher education qualification.
- In some sectors of the economy there is a mismatch between the skills and qualifications needed by employers, and those held by the workforce. For example, 39 per cent of vacancies in skilled trades are caused by skills shortages, and there are emerging shortages in areas such as health and care professionals.

In their desire to ‘win the global race’, policymakers have focused on increasing the number of graduates in the economy. However, winning the race will require more than simply expanding general higher education. Britain also needs stronger and better-quality vocational education, coupled with new business models that make better use of workforce skills and enable companies to move up the value chain. This will require employers to engage in a more meaningful way in vocational education and skills development. Without action in these areas, our economy will not be equipped to compete successfully on the global stage.

1. CONTEXT

The rise of the degree

In Britain, the period since the second world war has seen increasing numbers of people spend more time in education. A rise in the school-leaving age, coupled with an expansion of places in higher education, means that more people are staying on in education than at any point in history. In 1981 just 13 per cent of school-leavers went into higher education, compared to over 40 per cent today (Lindley and Machin 2012). When it comes to education, the workforce is now more qualified than it has ever been. The expansion of higher education is a common trend across most developed countries, as well as emerging markets such as China and Korea.

Policymakers continue to promote the expansion of higher education as a way to drive economic growth and social mobility in this country. Universities minister David Willets recently announced his intention to remove the cap on the number of students in the system in the hope of creating an extra 60,000 university places. Meanwhile, prime minister David Cameron has frequently talked about the need to win a 'global race' in skills. The emphasis for young people has been on completing A-levels and going into a full-time undergraduate degree.

These changes have been linked to a belief that our economy is changing in a way that requires people with higher levels of general education – or 'human capital' (Acemoglu and Autor 2010, Aghion et al 2009). Human capital theorists argue that Britain has developed a knowledge economy that requires more people with graduate degrees. They note how following the loss of mid-ranking jobs (such as clerical posts and manufacturing jobs) our economy has become hourglass-shaped, with lots of high-skilled jobs at the top and low-skilled jobs at the bottom but relatively few mid-level jobs in between. Higher education has been seen as the best way to ensure people have opportunities to access professional jobs, increasing the level of human capital in our country. On the other side of the coin, vocational education and training have tended to be neglected as a way to boost skills and growth. There is a longstanding disparity in the level of resources going to further education, and the number of apprenticeships on offer to young people has dropped over time.[1]

A more complex picture

There has been a lot of research into how Britain's job market has changed since the 1980s. This research into long-term trends in the economy broadly supports the story presented above: skilled manufacturing jobs have been lost to technological advances and international competition, and jobs have been created in knowledge-intensive services (Brinkley 2008). These changes are reflected in average earnings, which have remained considerably higher for graduates than for people without degrees, suggesting that the economy is generating a demand for these workers (Conlon and Patrignani 2011).

Over the last 10 years, however, other factors have begun to disrupt the focus that policymakers put on expanding general 'human capital'.

First, there have been reports of graduates being forced to take work that is not commensurate with their skills. News stories often cite examples such as 'bar staff with university degrees' to make this point (see for example Ross 2009). While this is not a

1 The Coalition government has started to rectify the imbalance in funding for 16–18-year-olds studying at further education colleges. However, this largely consists of 'levelling-down' the unit of resource for those studying in sixth forms.

uniform trend,[2] the problem of people being 'overqualified' affects certain pockets of the labour market, particularly in the service sector. This is partly a result of the recent recession, but it also reflects the fact that our economy is creating many jobs that do not necessarily require a degree, while at the same time the number of people gaining degree level qualifications has increased. The qualifications profile of the workforce has therefore increased at a faster rate than the skills requirement of some jobs, leading to some graduates (and school-leavers) taking low-skilled work (Roberts 2012). The result is a process of 'bumping down', as jobs that did not previously require a degree come to be staffed by graduates (Holmes and Mayhew 2012, Goos and Manning 2003, Canny 2002). This is a phenomenon that has been observed in a number of European countries (Dolphin et al 2014).

Second, and relatedly, Alison Wolf (2011) has argued that the expansion of qualifications is leading to a form of 'credentialism'. Employers increasingly require people to have qualifications because it helps them to screen applicants – rather than because those qualifications are actually needed to perform the job. To give an example, the CBI predicted in 2011 that over the following six years between a quarter and a half of jobs in sales, customers service, and administration would require a degree (CBI 2011). As Holmes and Mayhew note, there are two possible explanations for this trend:

> **'These projections may reflect either demand or supply side factors. It may be that occupations have genuinely up-skilled and reorganised to take advantage of more qualified workers, leading to an increase in demand. Alternatively, it could be that jobs have not up-skilled while the supply of highly qualified workers in the labour market has increased. These workers end up competing for jobs which, in the past, would not have employed a large number of graduates. Higher qualifications act as a screening mechanism for firms hiring new workers, rather than as a requirement based on the skill content of the job.'**
>
> Holmes and Mayhew 2012: 19–20

Holmes and Mayhew go on to show that many jobs which appear to have become more 'professionalised' over time may not reflect a genuine change in the nature of the work being performed. In the retail and wholesale sector, for example, the number of managerial jobs increased between 2000 and 2008. However, many of these managerial jobs were paid less than £400 per week, leading them to conclude that 'what has changed is not so much earnings as job titles' (Holmes and Mayhew 2012: 1).

Third, while it is true that on average graduates earn considerably more than those without degrees, the extent of this wage premium may have been overestimated. Research has shown that the rewards of higher education are mainly accruing to a small pool of graduates at the top end of the labour market (Lauder et al 2005, Brown et al 2012), whose very high earners drag the average up. There is also a large overlap between the earnings profile of graduates and those with A-levels. For example, the top 10 per cent of earners qualified to A-level earn slightly more than the median graduate, and the median earner qualified to A-level earns slightly more than the bottom 10 per cent of graduates. In this light, the benefits of having a degree are more modest than the proponents of human capital theory claim. While people who complete a university education will earn more over

2 Some sectors such as science and engineering face a shortage of graduates.

their career, on average, a significant number will not. It therefore remains possible to earn a substantial wage premium by completing other forms of education and training.

Fourth, a number of organisations have noted that some areas of the economy continue to demand mid-level technical skills, as opposed to general degree-level qualifications. Many strong sectors of the British economy – such as pharmaceuticals, digital technology, advanced manufacturing and green technology – require a large number of 'technicians', who typically hold level-3 and level-4 vocational qualifications. Using data from UKCES, Baker (2014) demonstrates that employers are especially struggling to find people with the right skills in areas such as skilled trades and manufacturing, where between 30 and 40 per cent of vacancies are caused by skills shortages. It is predicted that by 2020 the UK will face a shortage of 3.4 million workers qualified at level 3 (Humphries 2010). As a result of our ageing population, there will also be demand for growing numbers of people working in health and care, which are not necessarily degree-level jobs.

Fifth, the nature of work itself may be changing. Beaudry et al (2013) track how employers have been using skills over time. They demonstrate that in the 1980s and '90s the developments of new technologies, especially ICT (information communications technology), led to a demand for high-skilled workers who were able to adapt and deploy them in the workplace. This in turn prompted strong demand and high returns for those with graduate-level qualifications. Around the turn of the century, however, a 'great reversal' took place in the demand for skill and cognitive tasks. The authors argue that the IT revolution reached maturity around the year 2000 and as a result the demand for 'cognitive task workers' has slowed down. Similarly, Brown et al (2011) note that technology has made it possible to standardise jobs which were previously regarded as highly skilled. They describe a process of 'digital Taylorism' which means that in some firms even managers have to follow standardised and routine processes and operations.

Finally, it is important to remember that a large number of jobs will be created in the coming years as the postwar 'baby-boom' generation retires. The large number of people retiring will create opportunities in jobs of all skill levels and occupations, including technical jobs and skilled trades. The notion that job opportunities will be concentrated in high-skilled graduate positions has therefore been overplayed. Simply replacing people who retire from the workforce will create demand for people with a range of qualifications and experience, including those with vocational education and training (Baker 2014).

These six trends complicate the claims of human capital theorists that simply increasing the number of people with graduate degrees will be sufficient to open up opportunities for young people and produce the skills required to achieve economic growth. While it is true in aggregate terms that our economy is becoming more professionalised, this is only a partial account, and ignores the important role that vocational education can play. The remainder of this briefing paper looks at recent changes in the jobs market and makes projections about the likely skills that will be needed in the next 10 years.

2. LOOKING FORWARD: OUR CHANGING JOBS MARKET

When projecting which occupations will grow in the future, it is necessary to take two factors into account:

1. the jobs that will be created due to business growth, which is known as 'expansion demand'
2. the jobs that will be created due to people retiring or leaving the workforce, which is known as 'replacement demand'.

The following sections present data on both, taken from the latest Working Futures dataset.[3]

Skill categories
For the purposes of this paper, occupations have been divided into three skill levels: high, medium and low. We have included occupations at level 1 and 2 as 'low-skilled', level 3 as 'medium-skilled' and level 4 and above as 'high-skilled'. This follows the standard occupation classifications used by the ONS.

There is inevitably an element of overlap between these categories. This is particularly true for those falling into medium-skilled occupations, which includes a number of 'associate professional' occupations as well as those in skilled trades. Associate professional occupations often require people with level-4 qualifications (foundation degree, higher national diploma or similar), and could therefore be considered as high-skilled occupations in some reports. Level-4 qualifications have become an established route for people who want to pursue a vocational pathway to higher level skills. See ONS 2010 for more information.

Expansion demand

Table 2.1 shows expansion demand, or the projected change in the number of people in each occupation as a result of business growth between 2012 and 2022. This breakdown confirms the traditional story that jobs are being created mainly in high-skilled, professional occupations. In aggregate, these occupations are projected to see growth of 19.6 per cent, compared to medium-skilled roles (2.4 per cent growth) and low-skilled jobs, which will see a small decline.

It is important to note that there is a considerable degree of variation within these categories. For example while many low-skilled occupations are set to see a decline in the number of jobs available, there is projected to be a 26.9 per cent increase within caring and personal service occupations. In general, however, this table confirms the narrative of our economy becoming more professionalised.

3 The Working Futures dataset is compiled by UKCES (the UK Commission for Employment and Skills). It bases its projections on a range of sources including the Labour Force Survey and Office for National Statistics data, and provides one of the most detailed forecasts of sectoral and occupational change available. Given the range of data sources used to make projections, it is not possible to calculate precise margins of error. Typical error margins are +/- 7 per cent for occupational employment and +/- 2 per cent for occupational share. See Wilson et al 2014 for more information.

Table 2.1
Expansion demand by occupation category, 2012–22

	Expansion demand ('000s)	% change	No in 2012 ('000s)	No in 2022 ('000s)
22 Health professionals	332	25.0	1,328	1,660
11 Corporate managers and directors	493	22.5	2,191	2,684
21 Science, research, engineering. and technology professionals	354	20.4	1,735	2,089
24 Business, media and public service professionals	337	19.8	1,702	2,039
23 Teaching and educational professionals	152	10.1	1,505	1657
High-skilled	**1,668**	**19.6**	**8,461**	**10,129**
32 Health and social care associate professionals	102	30.7	332	434
35 Business and public service associate professionals	384	17.0	2,259	2,643
34 Culture, media and sports occupations	88	14.5	607	695
31 Science, engineering. and technology associate professionals	47	8.9	528	575
12 Other managers and proprietors	93	8.3	1,120	1,213
53 Skilled construction and building trades	73	6.6	1,106	1,179
52 Skilled metal, electrical and electronic trades	-103	-7.7	1,338	1,235
33 Protective service occupations	-39	-8.7	448	409
51 Skilled agricultural and related trades	-41	-10.2	402	361
54 Textiles, printing and other skilled trades	-236	-35.5	665	429
Medium-skilled	**368**	**2.4**	**8,805**	**9,173**
61 Caring personal service occupations	594	26.9	2,208	2,802
72 Customer service occupations	138	20.8	663	801
62 Leisure, travel and related personal service occupations	55	8.5	647	702
82 Transport and mobile machine drivers and operatives	-3	-0.2	1,500	1,497
41 Administrative occupations	-159	-5.7	2,789	2,630
71 Sales occupations	-202	-10.0	2,020	1,818
81 Process, plant and machine operatives	-211	-26.1	808	597
42 Secretarial and related occupations	-327	-34.6	945	618
92 Elementary administration and service occupations	-44	-1.6	2,750	2,706
91 Elementary trades and related occupations	-23	-4.0	575	552
Low-skilled	**-182**	**-2.6**	**14,907**	**14,725**

Source: Wilson et al 2014
Note: Column totals may not sum exactly due to rounding of data for each occupational category.

Replacement demand

The previous table shows projected changes as a result of business growth; however it does not include the impact of people retiring or leaving the workforce. This is a very important factor, because many jobs will become available as the baby-boom generation hits retirement age. What's more, these job vacancies will not necessarily be in the same occupations as those that are being created as a result of business growth.

Table 2.2 shows the projected change in job numbers as a result of people retiring or leaving the workforce.[4] It paints a very different picture from table 2.1, with strong growth projected within all three broad occupational levels. In terms of the absolute number of jobs created, there will be a particularly large increase in administrative occupations and caring and personal service occupations, each of which will require more than a million workers over the next decade.

Table 2.2
Replacement demand by occupation category, 2012–22

	Replacement demand ('000s)	% of base	Total no of employees ('000s)
11 Corporate managers and directors	844	38.5	2,192
24 Business, media and public service professionals	739	43.4	1,703
23 Teaching and educational professionals	666	44.2	1,507
22 Health professionals	572	43	1,330
21 Science, research, engineering and technology professionals	559	32.3	1,731
High-skilled	**3,380**	**40.28**	**8,463**
35 Business and public service associate professionals	865	38.3	2,258
12 Other managers and proprietors	534	47.9	1,115
52 Skilled metal, electrical and electronic trades	419	31.3	1,339
53 Skilled construction and building trades	374	33.5	1,116
34 Culture, media and sports occupations	259	42.5	609
51 Skilled agricultural and related trades	205	50.7	404
54 Textiles, printing and other skilled trades	198	29.8	664
31 Science, engineering. and technology associate professionals	167	31.4	532
32 Health and social care associate professionals	138	41.5	333
33 Protective service occupations	112	24.8	452
Medium-skilled	**3,271**	**37.17**	**8,823**
41 Administrative occupations	1,176	41.8	2,813
61 Caring personal service occupations	1,015	45.9	2,211
71 Sales occupations	718	35.3	2,034
82 Transport and mobile machine drivers and operatives	504	42.7	1,180
42 Secretarial and related occupations	431	45.6	945
62 Leisure, travel and related personal service occupations	310	47.9	647
81 Process, plant and machine operatives	226	27.9	810
72 Customer service occupations	235	35.3	666
92 Elementary administration and service occupations	1,043	37.6	2,774
91 Elementary trades and related occupations	194	33.7	576
Low-skilled	**5,852**	**39.37**	**14,657**

Source: Wilson et al 2014
Note: Column totals may not sum exactly due to rounding of data for each occupational category.

4 Replacement demand is defined by UKCES as 'job openings created by those leaving the labour force'. While this will primarily be people who are retiring, it also includes other factors such as mortality, people migrating or people changing career into a different occupation.

Even occupations which projected a small decrease as a result of business growth are likely to see a substantial demand for workers as a result of people retiring or leaving the workforce. For example, while table 2.1 projected a decrease of 159,000 administrative jobs as a result of expansion demand, table 2.2 projects that 1.2 million positions will be created in this category as a result of replacement demand. In total, over 5.8 million jobs are likely to be created at the bottom of the occupational ladder as a result of replacing the existing workforce.

In terms of the proportional change, skilled agricultural trades will see the largest increase in jobs as a result of people retiring (just over 50 per cent). Most mid-level skilled trades occupations are set to see around one-third of the current workforce leaving and needing to be replaced.[5] This shows that even as our economy becomes more 'professionalised', large numbers of people will be required in the middle and lower end of the occupational ladder.

Net demand

The previous two sections showed the projected growth in occupations due to expansion and replacement demand factors. Crucially, they showed that the impact on the country's occupational structure of people retiring or leaving the workforce will be far greater than that caused by business growth. The impact of people retiring has tended to be ignored in recent discussions about the creation of an 'hour-glass' economy and the rise of 'knowledge jobs'.

Table 2.3 combines these two factors to present the projected net demand for different occupations in 2022, including the total number of additional employees that will be needed in each broad category. There are several significant conclusions to come out of this breakdown.

- The trend of strong growth in high-skilled professional jobs remains clearly visible. An additional 5 million jobs are likely to be created in these areas, representing a 60 per cent increase over the next decade.
- However, there is also projected to be substantial growth in the middle- and low-skilled tiers – 1.6 million jobs in caring personal service occupations, for example, as well as 1.2 million additional jobs in business and public service associate professionals, nearly half a million jobs in skilled construction trades, and around a quarter of a million 'associate professional' jobs in areas such as health, science and engineering. These associate professional occupations often employ people who have completed level-3 and level-4 vocational qualifications.
- Although high-skilled occupations are growing at a faster rate, they are starting from a smaller base than low-skilled occupations. Therefore, while the fastest proportional growth will be at the top of the occupational ladder, in absolute terms the vast majority of jobs will continue to be found at the lower end of the occupational ladder. This can also be seen in figure 2.1.
- Just over a third of all jobs will be created in high-skilled occupations. The remaining two-thirds will be created in low- and medium-skilled occupations.
- Health and social care occupations show strong levels of demand across all skill levels, with new vacancies equivalent to between 68 and 73 per cent of the current workforce.

5 UKCES calculations for replacement demand include an estimate of jobs which may not be refilled after somebody leaves the workforce.

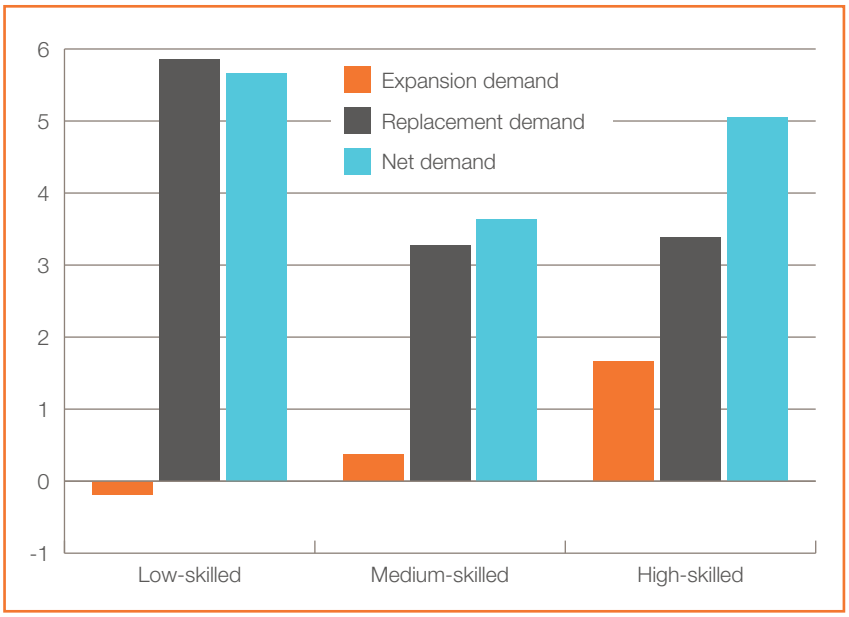
Table 2.3
Net demand by occupation category, 2012–22

	Net demand* ('000s)	% of base	No in 2012 ('000s)	No in 2022 ('000s)
11 Corporate managers and directors	1,337	61.1	2,188	3,525
24 Business, media and public service professionals	1,076	63.3	1,700	2,776
21 Science, research, engineering. and technology professionals	913	52.7	1,732	2,645
22 Health professionals	905	68.0	1,331	2,236
23 Teaching and educational professionals	818	54.2	1,509	2,327
High-skilled	**5,049**	**59.9**	**8,461**	**13,510**
35 Business and public service associate professionals	1,249	55.4	2,255	3,504
12 Other managers and proprietors	627	56.2	1,116	1,743
53 Skilled construction and building trades	447	40.1	1,115	1,562
34 Culture, media and sports occupations	347	56.9	610	957
52 Skilled metal, electrical and electronic trades	316	23.6	1,339	1,655
32 Health and social care associate professionals	241	72.1	334	575
31 Science, engineering and technology associate professionals	215	40.3	533	748
51 Skilled agricultural and related trades	164	40.6	404	568
33 Protective service occupations	72	16.1	447	519
54 Textiles, printing and other skilled trades	-38	-5.7	667	629
Medium-skilled	**3,640**	**39.6**	**8,819**	**12,459**
61 Caring personal service occupations	1,609	72.7	2,213	3,822
41 Administrative occupations	1,017	36.2	2,809	3,826
71 Sales occupations	516	25.4	2,031	2,547
82 Transport and mobile machine drivers and operatives	501	42.5	1,179	1,680
72 Customer service occupations	373	56.1	665	1,038
62 Leisure, travel and related personal service occupations	364	56.3	647	1,011
42 Secretarial and related occupations	104	11.0	945	1,049
81 Process, plant and machine operatives	14	1.8	778	792
92 Elementary administration and service occupations	998	36.0	2,772	3,770
91 Elementary trades and related occupations	171	29.7	576	747
Low-skilled	**5,667**	**36.8**	**14,616**	**20,283**

Source: Wilson et al 2014
* Excluding occupational mobility.
Note: Column totals may not sum exactly due to rounding of data for each occupational category.

The changing occupational structure of the economy is summarised in figure 2.1. It shows that there will continue to be strong demand for workers in low- and medium-skilled occupations in the future. In low and medium-skilled occupations this demand will largely be driven by people leaving the workforce, whereas the jobs created as a result of business growth are likely to be concentrated at the top of the occupational ladder.

Figure 2.1
Where will jobs be created between 2012 and 2022? (millions of jobs, by skill level)



Source: Data from Wilson et al 2014

3. IMPLICATIONS FOR EDUCATION AND INDUSTRIAL POLICY

Qualifications distribution

The data presented above has important implications for our education system. On one level it is clear that our jobs market will continue to professionalise and that in the future there will be strong demand for people with degrees and general 'human capital'. Policymakers are therefore right to give attention to the way that higher education can help drive skills, growth and social mobility. However, this trend should not be exaggerated, as there is also expected to be substantial demand in the lower half of the occupational ladder. Many of these occupations either lend themselves to more vocational forms of study, or are characterised by poor-quality jobs which do not make good use of people's skills. Policymakers must therefore focus on strengthening vocational education and training, as well as encouraging employers to make better use of the skills of their workforce and to improve the quality of jobs they offer.

Table 3.1 shows the breakdown of qualifications held by the UK workforce in each occupational category in 2013, enabling us to see the educational background of workers in each category. The projected demand for each occupation has also been included, so it is possible to see which occupations are likely to be demanding workers in the future and compare this to their current qualifications distribution. There are a number of interesting trends to note.

- As expected, the jobs at the top end of the occupational ladder are overwhelmingly held by people who have higher education qualifications (level 4 and above). There is likely to be strong growth in all these occupations over the next decade, suggesting a continued demand for higher education.
- There are a large number of people towards the bottom of the occupational ladder who have high qualifications. For instance, a fifth of all workers in low-skilled occupations have a higher education qualification. This suggests that many people may be 'overqualified' or in jobs that are unlikely to be making good use of their skills.[6] It appears that the creation of high-skilled jobs has not kept pace with the very rapid increase in educational attainment and qualifications.
- Strong growth is projected in occupations which currently employ people with low qualifications levels. It is projected that 5.7 million jobs will be created towards the bottom of the occupational ladder, and over half of workers in these occupations now are only qualified to level 2 or below. It appears that simply increasing the education levels of school-leavers will not be sufficient to drive the creation of more high-skilled jobs. Instead, more attention will have to be paid to industrial policy and the quality of jobs on offer. Otherwise there is a risk that our economy will continue to be characterised by low-productivity sectors that do not make good use of the skills that their workers hold and do not compete higher up the value chain.
- While there will be strong growth in degree-level jobs, the prevalence of these jobs may have been overestimated in some quarters. It is projected that 7,255,000 jobs will be created in occupation categories where less than half of the current workforce holds a higher education qualification (level 4 or above).
- There will be strong demand for workers in occupations which often rely on vocational qualifications. This is true at different levels of the occupational ladder. For example, health and social care, public services, skilled trades and administrative occupations are all occupations which have established entry routes for people with vocational qualifications. The strong growth in 'associate professional' occupations will provide

6 Of course, some graduates may have actively chosen to work in these occupations, so they should not all be regarded as having been 'forced' to take low-skilled work.

job opportunities for those who pursue a vocational pathway to higher-level skills (foundation degree or equivalent).

- A small number of occupations continue to rely heavily on trade apprenticeships. A fifth of workers in skilled construction trades and skilled metal, electrical and electronic trades hold an apprenticeship. There are projected to be 763,000 jobs created in these occupations in the next decade, suggesting a significant demand for people who complete an apprenticeship.

Table 3.1 Qualifications distribution by occupation (2013) plotted alongside net demand for each occupation, 2012–22

	Qualification distribution (% of workforce at each qualification level)							Projected demand 2012–22			
	NQF Level 4+	NQF Level 3	Trade Appr.	NQF Level 2	Below NQF Level 2	Other quals	No quals	Net demand ('000s)*	% of base	No in 2012 ('000s)	No in 2022 ('000s)
11 Corporate managers and directors	62	14	4	10	5	3	2	1,337	61.1	2188	3,525
24 Business, media and public service professionals	81	9	1	5	2	2	0	1,076	63.3	1700	2,776
21 Science, research, engineering and technology professionals	75	11	3	6	3	2	0	913	52.7	1732	2,645
22 Health professionals	94	2	0	1	1	2	0	905	68.0	1331	2,236
23 Teaching and educational professionals	94	3	0	1	1	1	0	818	54.2	1509	2,327
High-skilled	**81**	**8**	**2**	**5**	**2**	**2**	**1**	**5,049**	**59.9**	**8461**	**13,509**
35 Business and public service associate professionals	54	18	2	15	6	3	2	1,249	55.4	2,255	3,504
12 Other managers and proprietors	41	19	3	16	10	6	5	627	56.2	1,116	1,743
53 Skilled construction and building trades	9	27	21	13	12	10	9	447	40.1	1,115	1,562
34 Culture, media and sports occupations	63	13	2	10	5	5	2	347	56.9	610	957
52 Skilled metal, electrical and electronic trades	16	30	20	12	11	6	5	316	23.6	1,339	1,655
32 Health and social care associate professionals	60	19	1	12	5	2	1	241	72.1	334	575
31 Science, engineering and technology associate professionals	52	19	6	11	6	3	2	215	40.3	533	748
51 Skilled agricultural and related trades	20	14	6	17	14	11	18	164	40.6	404	568
33 Protective service occupations	34	23	4	20	12	4	2	72	16.1	447	519
54 Textiles, printing and other skilled trades	17	19	7	21	13	13	11	-38	-5.7	667	629
Medium-skilled	**37**	**20**	**7**	**15**	**9**	**6**	**6**	**3640**	**39.6**	**8,819**	**12,459**
61 Caring personal service occupations	30	28	2	22	9	5	3	1,609	72.7	2,213	3,822
41 Administrative occupations	35	21	2	22	13	3	3	1,017	36.2	2,809	3,826
92 Elementary administration and service occupations	12	12	4	20	19	13	20	998	36.0	2,772	3,770
71 Sales occupations	19	22	2	25	17	6	9	516	25.4	2,031	2,547
82 Transport and mobile machine drivers and operatives	9	10	8	19	20	21	12	501	42.5	1,179	1,680
72 Customer service occupations	30	24	2	23	14	4	3	373	56.1	665	1,038
62 Leisure, travel and related personal service occupations	17	25	10	20	12	9	7	364	56.3	647	1,011
91 Elementary trades and related occupations	8	11	6	16	19	19	21	171	29.7	576	747
42 Secretarial and related occupations	28	21	2	24	16	5	4	104	11.0	945	1,049
81 Process, plant and machine operatives	10	13	8	20	19	16	15	14	1.8	778	792
Low-skilled	**20**	**19**	**4**	**21**	**16**	**10**	**10**	**5,667**	**36.8**	**14,616**	**20,283**

Source: Wilson et al 2014, ONS
* Excluding occupational mobility.
Note: Column totals may not sum exactly due to rounding of data for each occupational category.

Skills shortages

As well as thinking about the general levels of education in our workforce, it is also important to consider whether skills and qualifications match the particular needs of employers. A number of surveys have revealed concerns that there is a growing mismatch between skills supply and demand in some sectors of the economy.

The number of job vacancies in the UK is now back to prerecession levels, which is a good sign because it shows that the economy is recovering and employers are recruiting again. However, the latest Employer Skills Survey shows that more than a fifth of vacancies remain unfilled because of skills shortages (Winterbotham et al 2014). This is a more troubling statistic, as it suggests that skills shortages could be acting as a brake on growth in some sectors.

Table 3.2 shows which occupations are facing the most severe skills shortages. Skilled trades have faced a longstanding problem in this regard, and the latest data shows that this continues to be the case, with 39 per cent of vacancies being caused by a lack of available skills. More recently, shortages have opened up in categories such as professionals, associate professionals, caring, leisure and other services staff, and machine operatives.

Table 3.2
Percentage of vacancies caused by skills shortages, by occupation, 2013

Occupation	Percentage of vacancies caused by skills shortage
Managers	20
Professionals	30
Associate professionals	26
Administrative/clerical staff	13
Skilled trades occupations	39
Caring, leisure and other services	27
Sales and customer services	13
Machine operatives	25
Elementary staff	13

Source: Winterbotham et al 2014

In a more detailed analysis, the UKCES report identifies four emerging pockets of skill deficiency:

- professionals in health and social work
- associate professionals in business services
- machine operatives in business services and construction
- caring, leisure and other services roles in public administration.

A particular skills shortage has been identified in science, technology, engineering and maths (STEM) disciplines. This affects sectors that are vital to rebalancing our economy away from financial services, such as health, advanced manufacturing, construction, tunnelling, pharmaceuticals and food-processing. These sectors of the economy rely heavily on STEM graduates as well as those who are qualified at technician level (level 3–4). Research by the Royal Academy of Engineering shows that the net demand for graduates in these disciplines is estimated to be 830,000 by 2020 and for technicians it is estimated to be 450,000 (Harrison 2012). However, far fewer

people are coming through our education system with these skills. The same study estimates that the UK will need an additional 40,000–50,000 STEM graduates a year to keep pace with demand.

Meanwhile, on the other side of the coin, the Wolf review (2011) raised concerns that too many young people are studying courses and qualifications that will not help them to get a job later in life (Wolf 2011). Her criticisms were targeted towards a number of level-2 vocational courses, which bring negative returns in the labour market because they send out a poor signal to employers and do not provide opportunities to progress to level-3 study. Males studying NVQ level-2 qualifications in college or on public training schemes were found to have wages that were on average 12–23 per cent lower than those of matched contemporaries who were 'less' qualified. It appears that young people are not always offered vocational courses that provide a good route into work, and some of the courses taken by young people are out of step with the demands of the jobs market.

Of course, the supply of skills for the economy is not just a matter for the education system alone. Employers also have a very important role to play in clearly articulating their skills needs and training up the workforce. Evidence from other countries shows that employers can help to ensure that the supply of skills better matches their needs. In the Netherlands, for example, employers are heavily involved in helping to design courses, quality-assure courses and offer work experience, as well as delivering their own apprenticeships and training (Casey 2013). In this light, vocational education and training should be seen as a partnership between employers and education providers.

England, by comparison, has historically struggled to engage employers in this way. The number of apprenticeship places on offer to young people has remained well below the level of demand over recent years, and last year the number of school-leavers going into apprenticeships actually fell by 1.4 per cent (Mirza Davies 2014). Education leaders are reporting difficulties finding enough employers to offer work experience to students on post-16 study programmes (AoC no date). And our employer bodies and trade unions are generally weaker than in other European countries, which can make it harder to engage employers in a sustained and systematic way in vocational education and training.

Conclusions

It has become widely accepted that over the last 30 years the labour market has become more polarised between high-skilled jobs at the top and low-skilled jobs at the bottom. This is largely because technological advances and global competition have led to a reduction in the number of middle-income jobs. Meanwhile there has been a growth in the number of service sector jobs, which tend to be clustered around high-skilled occupations (such as business services) and low-skilled occupations (such as care and hospitality) (Wren 2013).

These changes in our jobs market have been accompanied by a growing emphasis on expanding university study and general 'human capital'. Human capital theorists argue that increasing the duration and quality of general education will help to drive economic growth and the creation of high-skilled jobs (Acemoglu and Autor 2010, Aghion et al 2009). This has led to a focus by successive governments on expanding higher education, with relatively little attention paid to vocational education and training, or the way that firms demand and use skills in the workplace. A recent example of this tunnel-vision is the decision by the government to remove the cap on student numbers, with the

express intention of attracting more young people into full-time undergraduate degree courses, while at the same time it is cutting funding for further education and presiding over a reduction in the number of young people going into apprenticeships.

This briefing paper has examined the changing shape of the UK jobs market. To some extent the analysis supports the narrative of a labour market which is becoming more professionalised. It is clear that business growth, known as 'expansion demand', will largely drive the creation of graduate jobs at the top of the occupational ladder. These occupations will also see the fastest growth relative to other parts of the labour market. However, the analysis in this paper also presents a more complex picture of the people and skills that will be needed in the future. In particular, it shows that policymakers must be attentive to the number of jobs that will be created as people retire or leave the workforce. This 'replacement demand' will dwarf the number of jobs created as a result of business growth, and they will be in very different occupations. To give an example, an additional 1 million jobs are predicted in administrative occupations by 2022 – driven entirely by replacement demand.

It is also important to remember that while the *relative rate* of change will be large in some high-skilled occupations, these are starting from a lower base. In absolute terms there will continue to be a large number of jobs created in the bottom half of the occupational ladder. Between 2012 and 2022 just over a third of all jobs will be created in high-skilled occupations – the remaining two-thirds will be created in medium and low-skilled occupations. These findings have four important implications for policymakers.

First, it is not sufficient for policymakers to rely on increasing the number of graduates in the workforce as a way of creating more skilled jobs and driving economic growth. It appears from the data presented in this paper that the number of high-skilled jobs has not kept pace with the rate at which workers are becoming more highly qualified. Businesses are still creating large numbers of low-skilled jobs in areas such as administration, care and elementary services. In total, around 5.6 million jobs are projected to be created in low-skilled occupations between 2012 and 2022. The business models of many firms in these sectors are predicated on low pay and low skills. This was seen in the latest national Employer Skills Survey, where half of employers reported that they were not fully utilising their employees' skills (Winterbotham et al 2014). More needs to be done to encourage these firms to adopt more productive business models based on investing in – and using – the skills of their workforce (see Lanning and Lawton 2012).

Second, the emphasis on general university degrees may be producing more graduates than are required in some sectors of the labour market. A fifth of workers in low-skilled occupations hold a higher education qualification, prompting fears that their skills are not being properly used in the workplace. There is also a danger that this might be 'bumping down' other workers in the labour market. Policymakers therefore need to encourage firms to improve the quality of jobs on offer, to ensure they can make use of graduate skills. They should also develop alternative pathways from education into work that do not rely on general undergraduate degrees and are more tailored to the needs of the jobs market. IPPR, for example, has proposed expanding higher-level vocational education as a means for people to transition from school into work, through measures such as higher-level apprenticeships, employer-sponsored courses and the creation of more polytechnic-style institutions (IPPR CFHE 2013).

Third, there will be a strong demand for vocational education, which will provide a useful pathway into work for many people. While the 'golden route' – A-levels followed by a degree – receives the most attention from journalists and policymakers, this analysis shows that there will be strong growth in occupations that rely heavily on vocational courses and qualifications. This is true in lower-skilled occupations such as administration and care, but it also holds true further up the occupational ladder. For example, there is set to be an additional 3.6 million jobs in medium-skilled occupations by 2022 – including associate healthcare professionals, skilled trades and public service professionals – all of which employ large numbers of people with level-3 and level-4 vocational qualifications or apprenticeships. Policymakers and employers must therefore continue to invest and promote high-quality vocational courses.

Fourth, the courses and qualifications taken by young people need to better match the needs of employers. Some of the courses taken by young people have fallen out of step with the needs of the labour market. This, coupled with a reluctance by employers to engage in workforce training, means that a number of skills shortages are beginning to appear. These skills shortages could be constraining economic growth in key areas of the economy such as skilled trades and business services. More needs to be done to ensure that young people are given clear signals about which qualifications will help them to progress into a good-quality job. Just as important, the UK needs to develop ways for employers to systematically engage in vocational education and training, including by setting the content and standards for training as well as by providing more work placements and apprenticeships for young people.

In summary, the government is right to highlight the growing international competition for jobs and skills. However, winning the 'global race' will require more than simply expanding general higher education. Britain also needs stronger and better-quality vocational education, coupled with new business models that make better use of workforce skills and enable companies to move up the value chain. This will require employers to engage in a more meaningful way in vocational education and skills development. Without action in these areas, our economy will not be equipped to compete successfully on the global stage.

Future work

Over the coming year IPPR will be investigating possible policy responses to the issues raised in this briefing paper. Our flagship programme 'New Skills at Work' will analyse what can be done to boost job creation and develop a skilled workforce in Europe.[7] Meanwhile, our education team will be leading a substantive project on the future of further education for 14–19-year-olds, to ensure that it better meets the needs of young people to progress into further study or a job with prospects.

Annex

The research presented in this paper has focused on the projected demand for skills in the UK as a whole. In preparing this paper, IPPR also conducted analysis into how the jobs market has changed over the past 10 years, as well as a breakdown of the changing demand for skills by region. This data is available in the online annex, at: http://www.ippr.org/publications/winning-the-global-race-jobs-skills-and-the-importance-of-vocational-education or http://bit.ly/IPPR14259

7 For more, please see: http://www.ippr.org/major-programmes/new-skills-at-work

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