Efficiency and labour market polarisation

the work foundation

Knowledge economy programme report

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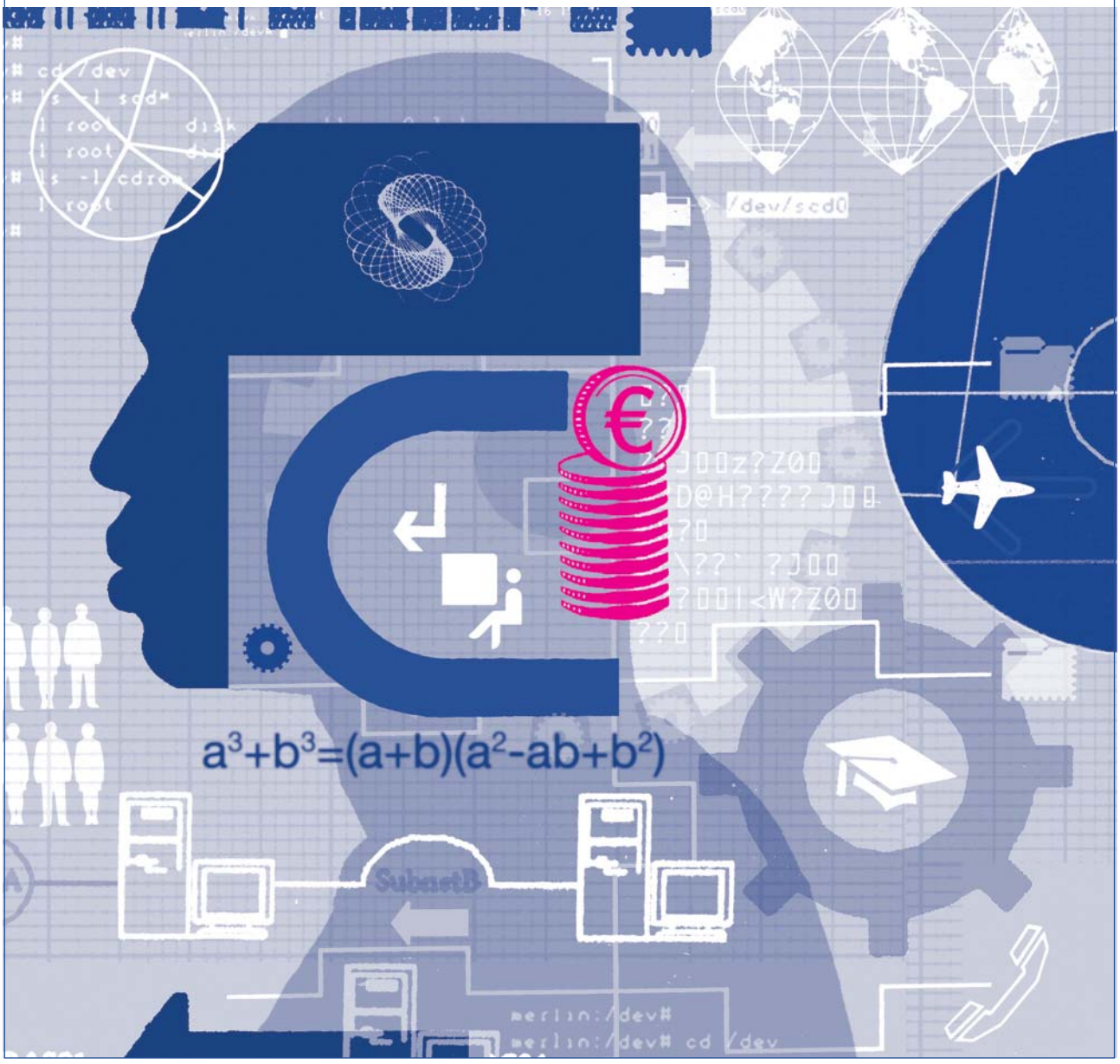

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About the Authors

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Executive summary

The knowledge economy gets a reasonably clean bill of health as far as polarisation between "good" and "bad" jobs is concerned. Overall, we agree with recent analyses positing a stable labour market and continued expansion of well-paid jobs at the top of the labour market. With the exception of some remaining job polarisation for men, our findings stand in contrast to the hourglass economy story from the 1980s that stemmed from deindustrialisation and the disappearing middle class.

Our conclusion may be surprising for those who favour skill-biased technological change (SBTC)—computerisation—as a key driver of polarisation and wage inequality. Although polarisation seems to have stabilised in recent years, the pace of computerisation certainly has not. At the very least, computerisation must be only one of several factors that is driving labour market inequalities.

Nonetheless, computerisation has had a big impact within occupational groups by eliminating many of the less demanding and more routine processing posts, while enhancing more analytical and complex communication jobs that require graduate level education. We think this may be an important factor behind the growth of graduates in jobs that did not traditionally require high educational attainment.

The overall evidence on overqualification is not clear-cut, however, due in part to issues in accurately measuring the construct. Given these limitations, we present evidence to suggest that graduate employment is expanding in both well-paid and poorly paid jobs. This can be interpreted as supporting the argument of over-supply of graduates in the labour market. Yet, this finding only applies to men; there is no evidence of polarisation for female graduates.

Furthermore, our research and others' revealed an imbalance between qualifications and job requirements among non-graduates. Many of those with even fairly basic skills appear to be overqualified for the jobs they have to do, or are working for quite low wages. Our findings also showed fairly large gaps between shares of non-degree holders and degree holders who were gainfully employed. That is, adults without degrees were less likely to be employed and more likely to be inactive relative to adults with degrees. This pattern of results

has not substantially changed between 1995 and 2005, however, which suggests that conditions are not worsening over time for non-degree holders.

A factor related to overqualification may be the creation of more entry jobs in occupations such as personal care that are traditionally poorly paid, but have become much more demanding vis-à-vis employees' skills as standards have risen. In addition, we suspect that migration may also have some influence on the margin, as some highly educated migrants take low-level jobs for lack of alternate options. Although it appears that migration has only a marginal impact on levels of overqualification in the UK, it may have had a greater impact on changes in some basic skills occupations. For example, our findings show a rather puzzling increase in graduates employed in elementary jobs, which may be due to increased migration over time.

We think that those who favour an expansion of higher education in response to rising demand from employers for graduate level skills are right to do so. The balance of our findings favours the interpretation that graduate supply and demand have remained broadly in balance at the aggregate level. In particular, we can find no support that either relative wages for graduates or the aggregate returns to higher-level education have fallen over time.

Whatever interpretation we put on these figures, a policy priority should be to address the lack of demand for skills and the poor quality of work in the bottom half of the labour market. There is some evidence to suggest that while overqualification appears to be a significant factor in many OECD economies (however poorly measured), the economic and social implications may differ. This, in turn, points to the importance of institutions connecting the labour market and the education system.

Background

With the rapid rise in technological advances over the last several centuries, many experts and policy makers believe that we are now living in a knowledge economy whereby occupations that capitalised on routine physical inputs or natural resources have been exchanged for jobs that rely on knowledge intensity, creation and innovation. Although experts disagree on the precise ingredients of the knowledge economy, most concur that the current economy relies more heavily on human and intellectual capital, investment in education and training, R&D and ICT than in the past.

According to The Work Foundation's Defining the Knowledge Economy paper (Brinkley 2006), knowledge workers have been defined in three separate, but inter-linked ways:

- Workers employed in the top three Standard Occupational Classifications (SOC), which include managers and senior officials, professionals and associate professionals and technicians
- Workers with high-level skills indicated by a degree or the equivalent
- Workers who perform tasks that require complex thinking and communications, often with the assistance of computers.

Unfortunately, these definitions all have disadvantages. Categorising workers by occupation or level of education lends itself to statistical analysis, but it is inevitably arbitrary and includes many who, by and large, would not be regarded as doing "knowledge work." The more sophisticated task-based measures developed in academic studies often require extensive reworking of the statistical evidence. Even categorising jobs as "good or "bad" on the basis of pay and skill level can be fraught with difficulty, as many jobs involve complex trade-offs, such as accepting lower pay to engage in employment which is high in non-economic benefits. With all these caveats in mind, we have for the purposes of this analysis used the top three occupational classifications as proxy for knowledge-based workers.

Regardless of the specific definition of the knowledge economy or knowledge workers, it is implicit that this new economy is sustained by a highly skilled workforce employed in jobs at the top of the labour market. While these "good" jobs have always existed, many believe that the knowledge economy has led to

increased job polarisation. That is, instead of an economy structured by majority "average" jobs and a strong middle-class, we currently have an economy where the increase in good, skilled jobs is balanced by an increase in bad, unskilled jobs with declines in between. If true, this trend towards polarisation suggests that many skilled and semi-skilled workers will find themselves working at the bottom-end of the labour market. Yet, research is mixed regarding: (1) the extent to which the current labour market is truly bifurcated into "good" and "bad" jobs and (2) whether the movement towards a knowledge economy is the leading cause of job polarisation net of other contributing factors.

The traditional argument surrounding the knowledge economy's role in the labour market is that it has led to rising demand for skilled relative to unskilled labour. In the past, researchers operationally defined knowledge workers as degree holders with high rates of computer use. Earlier work exploring links between the adoption of computer-based technology between the late 1970s and mid-1990s and the demand for more highly skilled labour concluded that this "skill-biased technological change" (SBTC) lessened the need for humans to engage in many routine clerical and production jobs, while simultaneously increasing the ability of highly-skilled workers to develop new products and tailor them to clients' specific needs (Katz and Autor 1999; Acemoglu 2002). Thus, computers became a substitute for routine tasks and a complement for skilled workers.

Indeed, research suggests that computer intensity was positively associated with the employment share of managers and professionals—knowledge workers—and negatively associated with the employment share of clerical and productions workers. These differences in employment share were particularly strong within industries rather than between them, suggesting that the skill profile within industries has shifted upward and that movement away from industries that have traditionally employed low skilled workers is less of an issue.

More recent research has identified a slightly different trend building on the types of work and workers that computing technology can replace. Specifically, Autor, Levy and Murnane (2003) empirically assessed the premise that computer capital can substitute workers who engage in routine tasks, those that require

methodological repetition. These routine tasks include both analytical tasks such as recordkeeping or telephone operating as well as manual tasks such as assembly line work.

Due to technological advances since the 1970s and 1980s, these occupations have likely declined over time. On other hand, demand for non-routine labour, which includes tasks that are not standardised enough for substitute computer programming, has increased over time. Indeed, these non-routine tasks include jobs that require complex problem solving, creativity and communications at the high-end and manual tasks such as housekeeping and construction on the lower-end. What this new conceptualisation suggests is that the labour market is becoming increasingly polarised with the bulk of employment share at the top- and bottom-ends. That is, a large proportion of employment share in the middle of the labour market required routine activities—the very activities that computing technology can replace. This revised hypothesis differs from the original SBTC argument such that if SBTC was the only operative, one would expect a strong positive association between initial wages and employment growth. Yet, this revised theory posits that growth will be seen in jobs at both the bottom and top of the wage hierarchy.

Recent work from the UK (Goos and Manning 2003), the US (Autor, Katz, and Kearney 2006) and Germany (Spitz-Oener 2006) assessed the proportion of the employment share in the bottom, middle and top of the labour market based on wages and occupation through 2000. By and large, the research revealed that employment growth between 1990-2000 was at the top and bottom of the labour market, supporting the polarisation hypothesis.

Are knowledge workers being used efficiently?

A related hypothesis to polarisation, also relevant to the knowledge economy, is that of overqualification. That is, in light of the proposed progression of the labour force into more highly skilled jobs, we are left to wonder if there are enough good jobs to go around. Does demand sustain the share of qualified workers churned out by the university system, or are degree-level workers now in jobs for which they are overqualified?

Research by Brynin and colleagues (2006) and Goos and Manning (2003) suggest that across all occupations—knowledge and otherwise—educational qualification levels have risen. Yet, research using a US sample from Gottschalk and Hansen (2003) found that they way in which qualifications or educational attainment is measured could influence findings. In their research, they found that college-educated workers were most likely to be employed in jobs that required college education.

If many UK workers are indeed overqualified for the work that they do, the current state of the knowledge economy is not efficiently and effectively using its prime resources for the future. Further, if true, the overqualification hypothesis suggests that there may be a structural mismatch between the educational system and the labour market.

Research questions

Based on the brief review above, we use data from the Labour Force Survey (LFS) Microdata Service to explore three research questions.

1. What is the pattern of job polarisation in the UK over the last decade?
2. Are there differences in wages and employment share among knowledge and non-knowledge workers?
3. Does the knowledge economy effectively and efficiently use its supply of skilled workers?

In this report, we focus on full- and part-time workers and explore findings for both men and women. Differences noted between 1995 and 2005 are statistically significant.

What does the data say?

What is the pattern of job polarisation in the UK over the last decade?

Based on methods suggested by Massey and Hirst (1998), we explore the pattern of wages among full-time UK workers using data from the Labour Force Survey. We focused on the years 1995 and 2005, as we wanted to make use of the most recent data. We computed the proportion of workers in each of nine categories based on median wages for full- and part-time workers, respectively, in both years (i.e., £272/week for full-time workers and £5.38/hour for part-time workers in 1995; £401/week for full-time workers and £8.19/hour for part-time workers in 2005)[1]:

- ≤60% of median income
- 80% of median
- median
- 120% of median
- 140% of median
- 160% of median
- 180% of median
- 200% of median
- >200% of median

Subsequently, we explored the differences in the percentage of workers at the top, middle and bottom end of the wage distribution between 1995 and 2005. Examining the pattern for all workers, aggregated over sex, may mask some important distinctions between male and female workers. As such, we also explored wage distribution separately for men and women.

The data presented in Table 1 suggests several patterns in the labour market. The distribution of males' wages appeared to polarise slightly between 1995 and 2005, as employment share at the bottom- and top-ends of the labour market increased over time. Employment share in the very lowest wage category decreased slightly over time, yet there was a 19% increase (2.59 percentage points) in the number of males earning 80% of the median in 2005 relative to 10 years prior. There was a similar increase at the very top of the labour market, with nearly 15% of men earning more than double the median income in 2005 relative to 12% in 1995. While the change in employment share at the median did not significantly change over time for men, there was decline in men earning between 120% and

[1] While it is customary to use income deciles based around the median, we opted to use categories that represent respondents living in poverty at the low-end and more than double the median at the high-end.

180% of the median between 1995 and 2005. This decrease in employment share ranged from 1.08 to 1.55 percentage points, which represents a 10% to 15% decrease.

Table 1. Wage structure for full- and part-time workers based on median weekly income, 1995 to 2005

	Percentage distribution		Change	
	1995	2005	Difference	Ratio
Male workers				
≤60% of median	10.85%	9.79%	-1.05%	0.90
80% of median	13.91%	16.49%	2.59%	1.19
Median	15.61%	16.56%	0.95%	1.06
120% of median	16.04%	14.49%	-1.55%	0.90
140% of median	10.78%	9.58%	-1.21%	0.89
160% of median	9.14%	7.78%	-1.36%	0.85
180% of median	7.03%	5.95%	-1.08%	0.85
200% of median	4.22%	4.67%	0.45%	1.11
>200% of median	12.43%	14.69%	2.26%	1.18
Female workers				
≤60% of median	17.74%	14.75%	-2.99%	0.83
80% of median	21.24%	20.58%	-0.66%	0.99
Median	20.10%	21.26%	1.16%	1.06
120% of median	13.10%	12.22%	- 0.89%	0.93
140% of median	8.18%	7.63%	- 0.55%	0.93
160% of median	6.31%	6.21%	-0.11%	0.98
180% of median	3.91%	4.70%	0.79%	1.20
200% of median	2.12%	3.32%	1.20%	1.56
>200% of median	7.30%	9.35%	2.05%	1.28

Source: Labour Force Survey Microdata Service

The pattern for women between 1995 and 2005 was generally an upwards, linear progression such that the employment share in the lowest income bracket decreased quite dramatically by 17% between 1995 and 2005, then more or less stabilised among women earning between 80% to 160% of the median and

finally began to significantly increase over time among women earning 180% or more of the median. Employment share continued to increase alongside wages at the higher end of the labour market. Increases at the top-end ranged from .79 to 2.05 percentage points, which represents a 20% to 56% increase over time.

We also computed an index of polarisation, whereby an index of 1 indicates that the middle and extremes of the income distribution changed at the same rate between 1995 and 2005. An index greater than 1 specifies a shift towards the poles over time (high or low), while an index less than 1 suggests that employment share shifted towards the middle over time.[2]

Table 2. Polarisation index for full- and part-time workers, 1995 to 2005

	Polarisation index
Male workers	1.20
Female workers	1.14

Source: Labour Force Survey Microdata Service

The polarisation index for males was 20% above the parity point indicating a meaningful shift to the extremes over time. For men, growth was at both ends of the labour market. Based on the polarisation index for women, the wage distribution also appeared to move away from the middle. In this case, the index represents growth among top-earners between 1995 and 2005.

The general conclusion from this analysis is that employment became somewhat polarised for men between 1995 and 2005 where we saw some growth in employment share among low (but not the lowest) and high earners and declines in employment in the middle. Among full-time women, we saw a significant decline in the percentage of women earning the very lowest wages and a shift upwards at the top of the labour market between 1995 and 2005.

[2] To create the polarisation index, we first created the mean ratio of the proportion of workers in 2005 relative to the proportion of workers in 1995 at the extremes (i.e., 2005:1995 ratio for <80% of median and >200% of median) and the mean ratio in the middle of the income distribution (i.e., 2005:1995 ratio for 100% of median to 180% of median) and divided the two numbers.

$$\text{Polarisation index} = \frac{[\text{ratio}(<60\% \text{ of median}) + \text{ratio}(80\% \text{ of median}) + \text{ratio}(200\% \text{ of median}) \text{ratio}(>200\% \text{ of median})]/4}{[\text{ratio}(\text{median}) + \text{ratio}(120\% \text{ of median}) + \text{ratio}(140\% \text{ of median}) + \text{ratio}(160\% \text{ of median}) + \text{ratio}(180\% \text{ of median})]/5}$$

These findings are aligned with research from the Department of Trade and Industry (Fitzner 2006) that explored the polarisation hypothesis using hourly earnings from all workers aggregated over sex. The DTI analysis reported a decrease in employment share in the bottom income decile between 1998 and 2005, coupled with a substantial increase in employment share in the second decile over the same time period. Among top earners (tenth decile), a slight increase in employment share was found. Yet, there were almost no changes over time in the remaining deciles. The DTI findings were not consistent with the thesis of a disappearing middle.

The whole of these findings suggest an important change in the polarisation story around the mid 1990s. Labour market polarisation may have been an important feature in the 1980s following deindustrialisation, but over the past decade the position is considerably more stable with the most significant changes occurring at the top end of the labour market. Moreover, the gender analysis suggests that any persistence in polarisation is confined to men. It is hard to argue from these findings that the knowledge economy has been a major driver of labour market polarisation. Indeed for women in employment, it may have been a positive factor in improving their aggregate labour market position.

The change in story in the mid 1990s also suggests a number of factors at work, not just computerisation, which may account for some of the growth at the top of the labour market. The pace of computerisation has certainly not slackened over the past 10 years. Indeed, ICT investment rates have increased, reaching over 4% of GDP in the UK in 2004. It is not very obvious why computerisation should drive polarisation in the 1980s but not in more recent periods. A paper by US economists Dew-Becker and Gordon (2005) expressed scepticism about the traditional emphasis on skill-biased technological change as the primary driver of US wage inequality. They point out that some of the most substantial increases in inequality in the US occurred in periods of slower technological progress. Further, Europe has not experienced similar increases in wage and income inequality despite the introduction of similar technologies into European workplaces.

Increases in the labour market position for women are likely attributable—directly or indirectly—to legislation regarding women's statutory right for

maternity leave. Recent studies have shown that women today are more likely than in the past to return to the same jobs following the birth of their children and, for those in professional positions, they are able to experience vertical mobility in their jobs (Dex, Ward, and Joshi 2006; Gregg and Wadsworth 2002).

It is likely that the National Minimum Wage (NMW) accounted for some of the declines within the lowest earnings category for both men and women. Yet, NMW is not a panacea for poorly paid employment, as the number of men earning 80% of median wages increased by 19% between 1995 and 2005.

By way of explaining the increases in the percentage of men earning 80% of median wages, there is evidence to suggest that the rise in Accession or A8 workers in the UK may account for some of the increases at the bottom of the labour market for men (Home Office et al. 2006). Fifty-nine percent of these workers are men and are most commonly employed in typically low-wage jobs such as factory workers, kitchen and catering assistants and cleaners or domestics. Indeed, 78% of registered A8 workers earned between £4.50 and £5.99 per hour, which is 25% to 50% less than the median part- and full-time hourly earnings, respectively, in 2005.

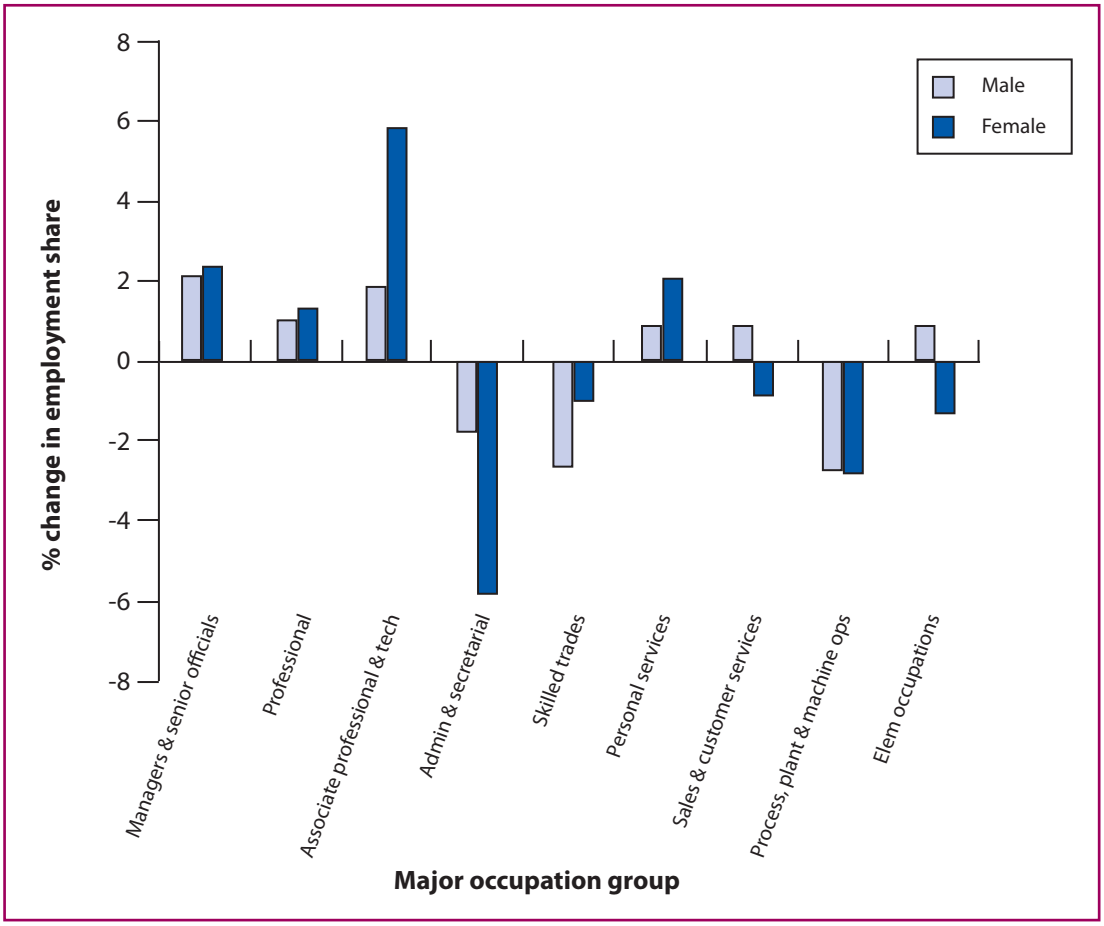
In the next section we examine employment and unemployment share within occupations to better understand shifts over the last decade.

Are there differences in wages and employment rates among knowledge and non-knowledge workers?

Our first analysis examined patterns of employment share by occupation between 1995 and 2005. To equate major Standard Occupational Classification (SOC) categories using 1990 and 2000 definitions, we used the recategorisation procedure developed by Elias and Purcell (Elias and Purcell 2004).[3] Figure 1 displays the change in employment share between 1995 and 2005 in each of the major occupation groups among full- and part-time workers.

[3] Thirteen percent of 1995 minor occupations (using SOC90) were recoded for comparative purposes; minor occupations were then aggregated to the first digit SOC.

Figure 1. Change in employment share in 9 major occupational groups (SOC2000) by sex, 1995 to 2005



Source: Labour Force Survey Microdata Service

On average, the share of employees in knowledge occupations, which include managers and senior officials and professional and associate professional and technical occupations, rose approximately 2 percentage points between 1995 and 2005. Growth for women in associate professional and technical occupations, however, grew rather substantially by 6 percentage points. In 2005, fewer males and females were employed in administrative and secretarial positions, skilled trades and process, plant and machine operatives relative to 1995 rates. Decreases in the percentage of women employed in administrative and secretarial professions were particularly sizeable. It is likely that increases in computing technology eradicated the need for some of these jobs.

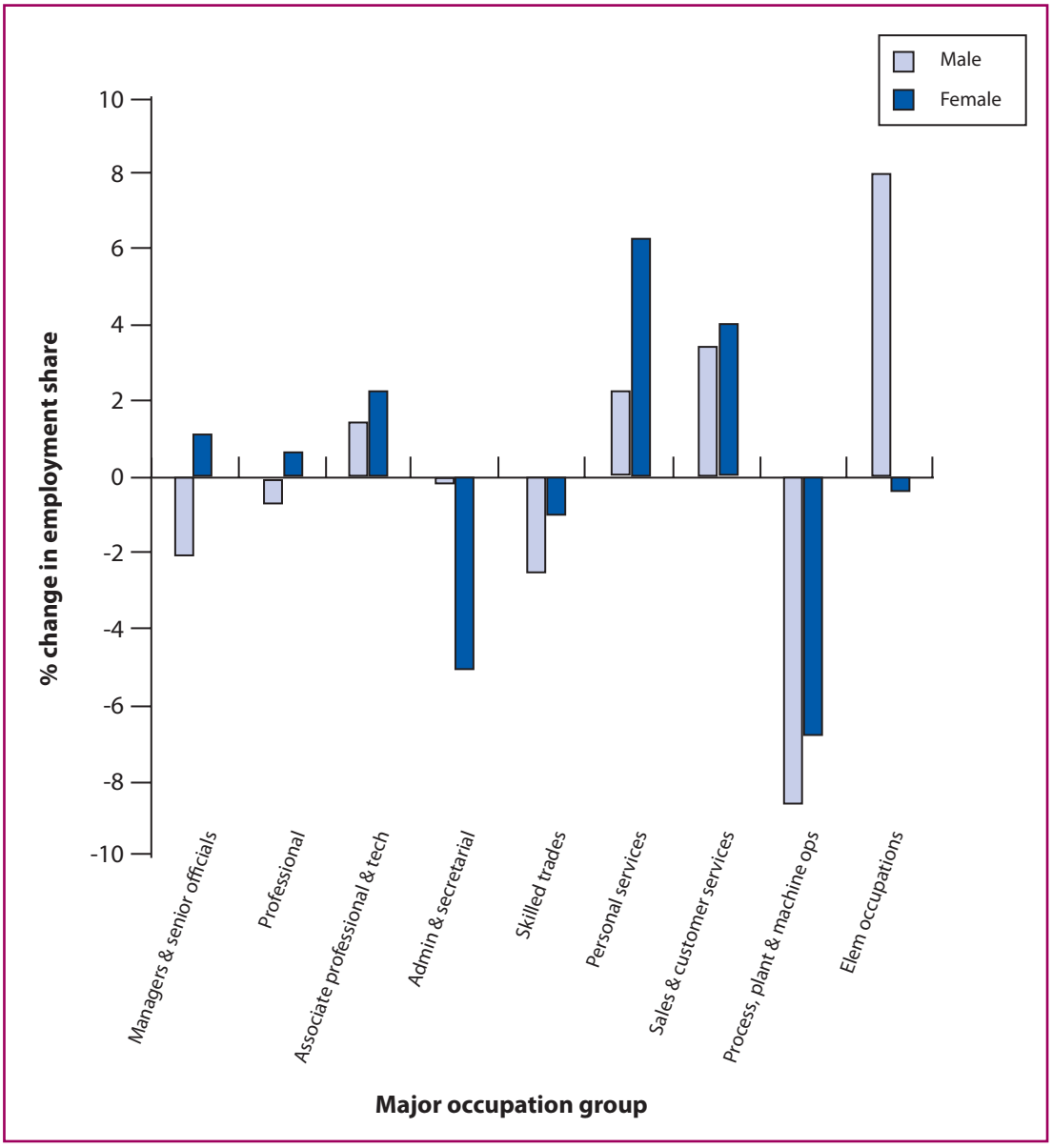
Employment share in personal services remained fairly steady over time for males and increased for females. Within sales and customer services and elementary occupations, slight increases over time appeared for men, coupled with small decreases for women. Growth in elementary posts, personal services and sales and customer services among men between 1995 and 2005 likely account for the growth of employment at the bottom-end of the labour market reported in the previous section.

By and large, these findings suggest growth over the last 10 years in knowledge occupations and decline among workers employed as administrators and secretaries, skilled trades people and process, plant and machine operatives—likely the very jobs in jeopardy as a result of computing technology and competition from low-wage manufacturing imports.

The recent Working Futures report, which estimated changes in occupational structure from 2004 to 2014, reported fairly similar findings to those displayed in Figure 1 with the exception of elementary occupations (Wilson, Homenidou, and Dickerson 2006). Working Futures predicted a large decline in these posts over time, particularly for full-time males and part-time females. While our analysis indicated declines for women employed in elementary occupations including both full- and part-time workers, we did not see a concomitant decrease in elementary employment for full-time men. It is possible that part of the explanation is employers are offering more full-time employment in response to changes in labour supply from migrants.

To better understand the pattern of "good" and "bad" jobs (as defined by wages) in the past 10 years in the UK, we explored changes in employment share by occupation for workers at the bottom- and top-ends of the labour market (see Figures 2 and 3). The former comprises workers earning less than 60% of the median income in 1995 and in 2005 and the latter, workers earning more than twice the median.

Figure 2. Change in employment share among lowest earning workers in 9 major occupational groups by sex, 1995 to 2005



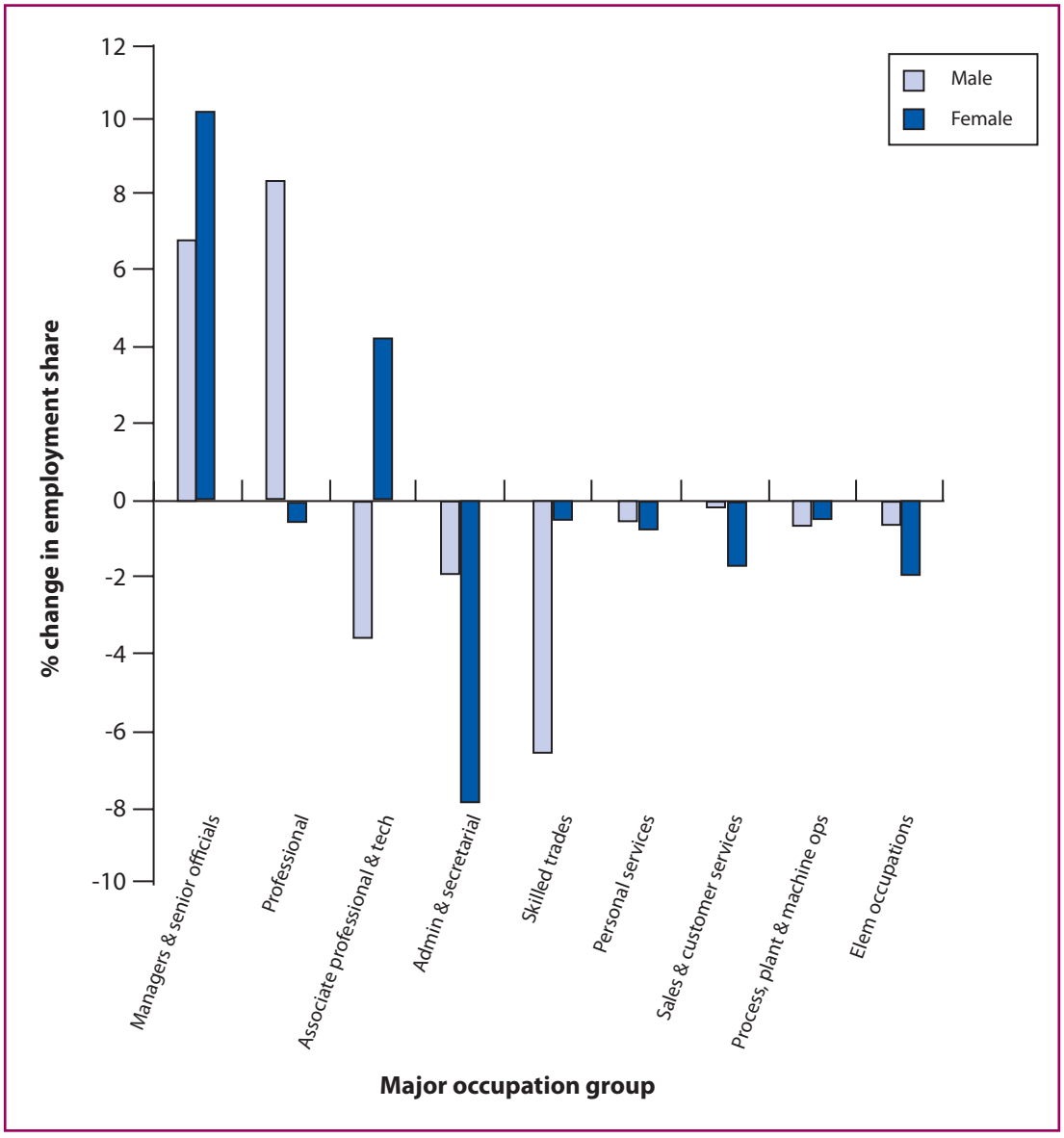
Source: Labour Force Survey Microdata Service

Among the lowest earning workers, employment share dropped between 1995 and 2005 for managers and senior officials (males only), professionals (males only), administrators and secretaries (females only), skilled trades-people and process, plant and machine operators. Large increases in low-wage work were apparent for sales agents and customer service representatives, female personal service workers, and men employed in elementary occupations. The emerging pattern of low-wage work appears to be women employed in personal services, which include healthcare, childcare and housekeeping, and men in elementary positions such as security, cleaning or construction. It appears that the small increase in elementary occupations for men reported in Figure 1 is driven by increase in low-wage elementary occupations. We examine shifts in specific occupations among low earners more closely in the following section.

Figure 3 presents change in employment share among the top wage earners. Turning first to knowledge workers, we can see that there were large increases in the percentages of managers and senior officials, professionals, associate professionals (females only) over time. Growth in employment share for women outgrew men in the highest positions—managers and senior officials—in the past decade. Interestingly, male employment share in associate professional positions decreased over time. It may be that men are entering these fields at the professional level (and bypassing associate professional). Finally, employment share in non-knowledge positions stalled or decreased between 1995 and 2005 for high earners.

Putting these findings together, our analyses revealed growth in sales and customer services, personal services (women only) and elementary occupations (men only) among full-time workers at the bottom of the wage distribution over the last decade. At the top-end of the labour market, we reported general increases in employment share within knowledge occupations—managers and senior officials, professionals (men only) and associate professionals (women only).

Figure 3. Change in employment share among highest earning workers in 9 major occupational groups by sex, 1995 to 2005



Source: Labour Force Survey Microdata Service

These wage specific analyses accentuated the overall occupational patterns displayed in Figure 1—moderate increases in knowledge occupations, decreases in routine administrative, skilled and process, plant and machine-related jobs and increases in personal services. The findings on sales and customer services and elementary occupations were more mixed, whereby we saw little change over time across all full-time employees, but large increases for low-earning men and women, respectively.

To gain a better sense of the specific occupations low and high earners are employed in both 1995 and 2005, we list the top 10 most common occupations in Table 3.

Table 3. Most common occupations (4-digit SOC2000 codes) for low and high earners by sex, 1995 to 2005

	1995	2005
Low earners		
Male		
1.	Other goods handling & storage occupations	Sales & retail assistants
2.	Sales & retail assistants	Other goods handling & storage occupations
3.	Heavy goods vehicle drivers	Kitchen & catering assistants
4.	Packers, bottlers, canner, fillers	Cleaners, domestics
5.	Chefs, cooks	Labourers build & woodworking trades
6.	Bar staff	Chefs, cooks
7.	Gardeners & groundsmen	General office assistants or clerks
8.	Motor mechanics, auto engineers	Van drivers
9.	Fork-lift truck drivers	Gardeners & groundsmen
10.	Metalworking productions & maintenance fitters	Bar staff

	1995	2005
Low earners		
Female		
1.	Sales & retail assistants	Sales & retail assistants
2.	Care assistants & home carers	Care assistants & home carers
3.	General office assistants/clerks	Educational assistants
4.	Kitchen & catering assistants	Kitchen & catering assistants
5.	Cleaners, domestics	General office assistants or clerks
6.	Personal assistants & other secretaries	Cleaners, domestics
7.	Accounts & wages clerks, bookkeepers & other financial clerks	Nursery nurses
8.	Sewing machinists	Retail cashiers & check-out operators
9.	Childminders & related occupations	Waiters, waitresses
10	Filing & other records assistants/clerks	Receptionists
High earners		
Male		
1.	Marketing & sales managers	Marketing & sales managers
2.	Production, works & maintenance managers	ICT managers
3.	Directors & chief execs of major organisations	Managers in construction
4.	ICT managers	Medical practitioners
5.	Financial managers & chartered secretaries	Software professionals
6.	Police officers (sergeant & below)	Managers in mining & energy
7.	Software professionals	Financial managers & chartered secretaries
8.	Office managers	Secondary education teaching professionals
9.	Financial & investment analysts & advisors	Chartered & certified accountants
10.	Medical practitioners	Personnel training & industrial relations managers

	1995	2005
High earners		
Female		
1.	Marketing & sales managers	Marketing & sales managers
2.	Personnel training & industrial relations managers	Hospital & health service managers
3.	Solicitors & lawyers, judges & coroners	Personnel training & industrial relations managers
4.	Managers & proprietors in other services	Primary & nursery education teaching professionals
5.	Retail & wholesale managers	Management consultants, actuaries, economists & statisticians
6.	Travel & tour guides	Medical practitioners
7.	Software professionals	ICT managers
8.	Medical practitioners	Solicitors & lawyers, judges & coroners
9.	Advertising & public relations managers	Higher education teaching professionals
10.	Journalists, newspaper & periodical editors	Financial & investment analysts & advisors

Source: Labour Force Survey Microdata Service

As seen above, the nature of good and bad jobs has not radically shifted in the past 10 years. Indeed, there was some overlap for men at the bottom-end of the labour force in 1995 and 2005. At both time points, low-earning men were commonly employed as sales and retail assistants, goods handling and storage occupations, drivers and gardeners. Relative to 10 years ago, men in 2005 were more likely to be employed in low-wage elementary jobs (3/10 occupations in 1995 vs. 5/10 in 2005) and less likely to be employed in skilled trades and process, plant and machine operatives (6/10 occupations in 1995 vs. 3/10 in 2005).

For low-wage female workers, employment appeared to shift away from administrative and secretarial positions to personal services between 1995 and 2005. In 2005, 3/10 of the common low-wage jobs for women involved caring for others, relative to only 2/10 in 1995. Thus, we see these personal services positions increasing in popularity, yet they remain extremely low paid. Compared to men in 2005, low-wage women were less likely to work in elementary occupations (5/10 vs. 3/10 for men and women, respectively).

In 1995, the top 10 occupations were exclusively knowledge occupations. Among men, ICT managers moved in popularity from fourth to second position. Being a medical practitioner gained in popularity between 1995 and 2005 for men. This is likely due to the UK medical services contract implemented in 2004, promising to improve working life and quality of work for medical personnel. Relative to 1995, high-earning women in 2005 were more likely to be employed in professional posts including teaching and medical posts (5/10 vs. 3/10).

Next, we explored patterns of unemployment and economic inactivity among UK workers by last occupation between 1995 and 2005 (SOC90 occupations were recoded to reflect SOC2000 codes).[4] We computed these percentages using the full sample of working age adults as the denominator (i.e., including any employed, unemployed and inactive adults). Unemployed respondents were actively looking for employment, while inactive respondents were not. By and large, patterns of unemployment and inactivity were relatively similar over the decade between 1995 and 2005. Figures 4 and 5 depict unemployment ratios by occupation in last job in 1995 and 2005 for males and females, respectively.

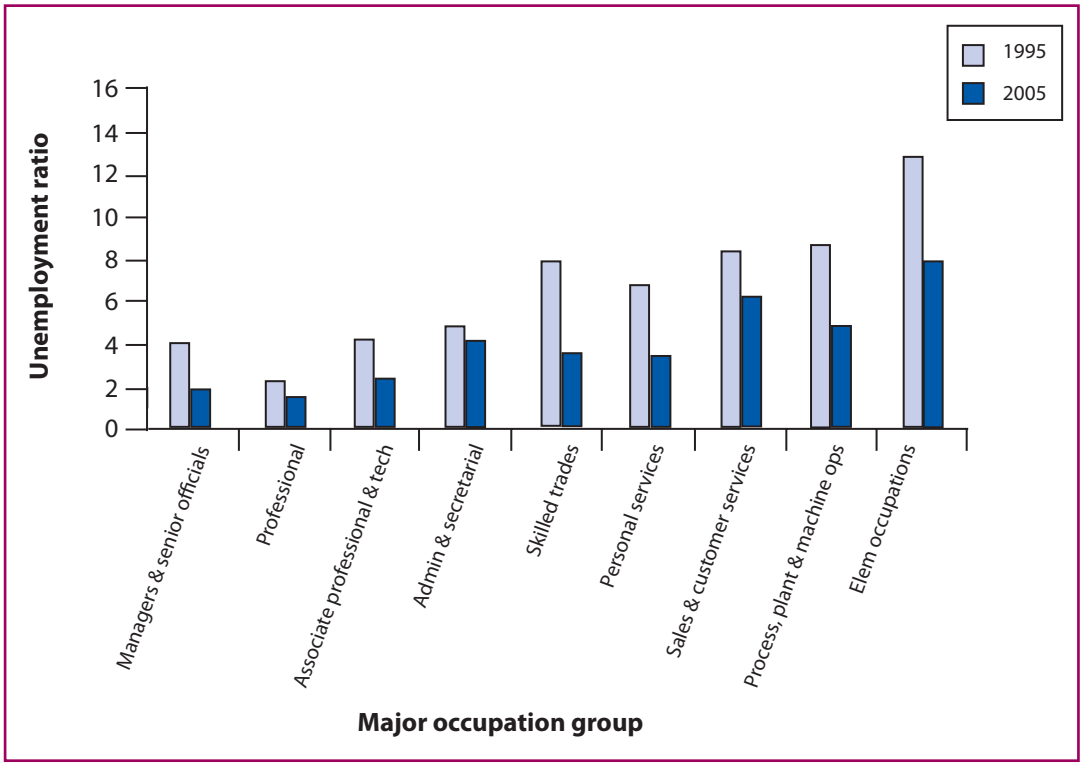
Percentages in 1995 were higher across all occupations (with the exception of administrative and secretarial jobs for which the difference between 1995 and 2005 percentages was not statistically significant), reflecting the higher unemployment rate during this year in the UK. Respondents who previously worked in elementary occupations had the highest unemployment at both time points, and those previously employed in professional occupations, the lowest. Employment share in elementary occupations increased between 1995 and 2005, particularly among low-earners (see Figure 2), suggesting that these posts are in demand, but that there may be a lot of churning in and out of jobs.

In general in 2005, unemployment was lowest among knowledge workers (i.e., professional, associate professional and technical and managers and senior officials) as well as respondents who were working in personal services. Again, looking back at Figure 1, we see an increase in employment share within each of these occupations from 1995 to 2005. Finally, while employment share decreased

[4] Non-responses rates for last occupation were quite high among unemployed and inactive workers: 23% for unemployed and 63% for inactive across timepoints. Thus, the sample for which we have previous occupation is not likely to be nationally representative.

between 1995 and 2005 for workers in process, plant and machine operatives, skilled trades and administrative and secretarial occupations, unemployment ratios were only modest in 2005.

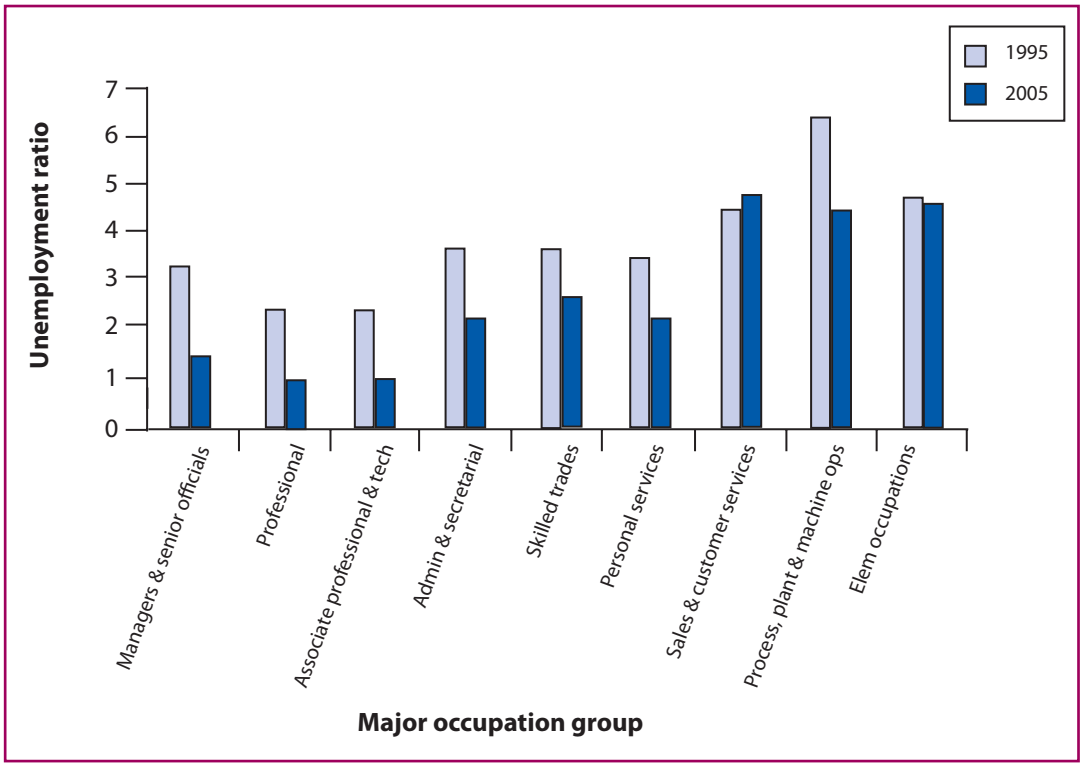
Figure 4. Unemployment ratios by last occupation, males 1995 to 2005



Source: Labour Force Survey Microdata Service

Among women, unemployment was higher in 1995 than in 2005 with the exception of workers who were last employed in sales and customer services and elementary occupations. High ratios of unemployment were also seen across time points in sales and customer services, process, plant and machine operatives and elementary occupations. Unlike men, employment share in elementary occupations for females had not seen a sharp rise over the last decade. Together with the general decline in employment share in process, plant and machine operatives over time (see Figure 1), it may be that many unskilled women are without a job.

Figure 5. Unemployment ratios by last occupation, females 1995 to 2005

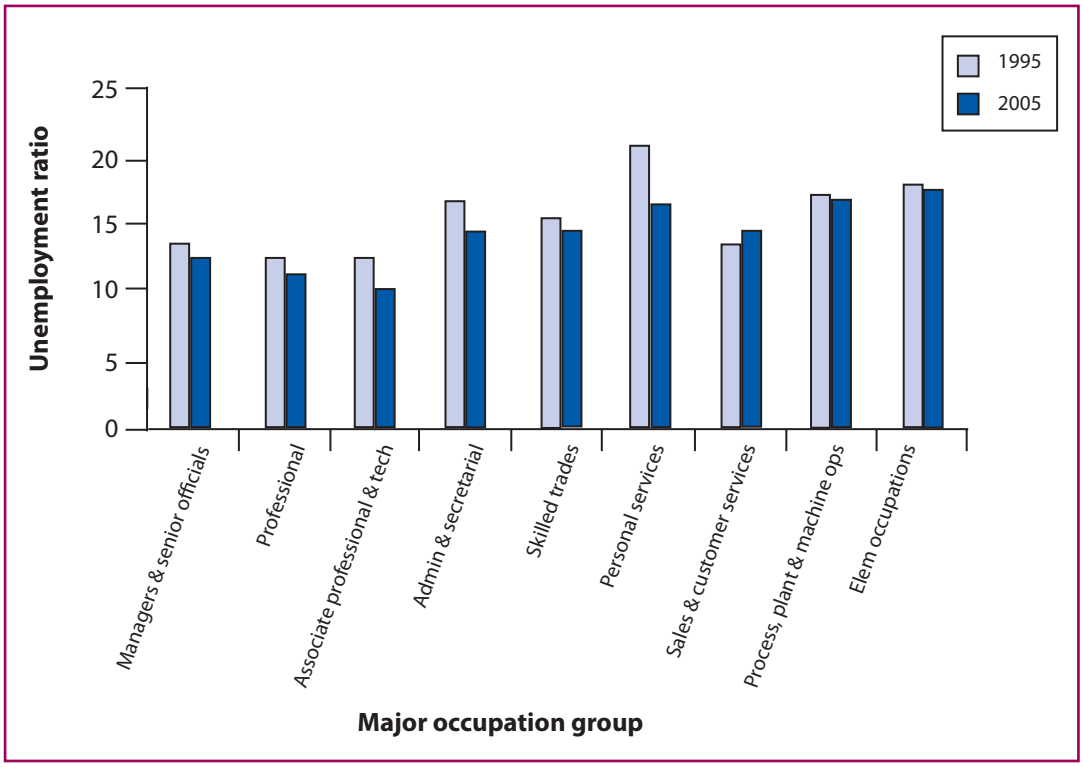


Source: Labour Force Survey Microdata Service

Unemployment was lowest among women previously employed in knowledge occupations—managers and senior officials, professionals and associate professionals. Given the large drop in employment share between 1995 and 2005 among administrative workers and secretaries, it is not surprising that we see moderate unemployment.

In addition to unemployment ratios, we also explored the prevalence of inactivity by previous occupation (as a proportion of working age adults). Inactivity ratios were considerably higher than the unemployment figures and the patterns were somewhat different. Figures 6 and 7 present the findings for men and women, respectively.

Figure 6. Inactivity ratios by last occupation, males 1995 to 2005

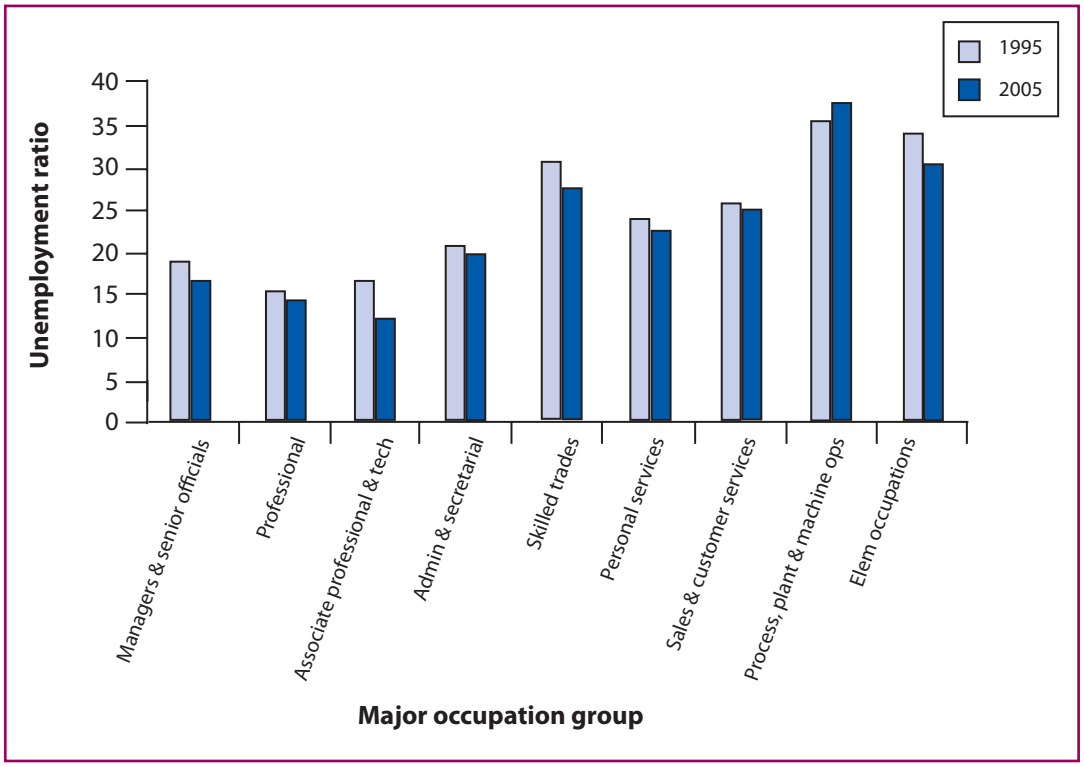


Source: Labour Force Survey Microdata Service

By and large, inactivity was relatively similar across the decade, with the highest ratios among men who had previously worked in process, plant and machine operatives, elementary occupations or personal services. In both 1995 and 2005, inactivity for men was lowest in knowledge occupations. Respondents claimed health-related reasons and retirement as the primary reasons for their inactivity. In 1995 only, redundancy was also commonly cited, particularly among men who had worked in process, plant or machine operatives.

Among women, patterns of inactivity by previous occupation were quite similar in 1995 and 2005. Inactivity was highest among female respondents who previously worked in process, plant and machine operatives and elementary occupations, with skilled trades following close behind. Heath-and family-related reasons were the primary correlates of inactivity in these occupations. Women who have

Figure 7. Inactivity ratios by last occupation, females 1995 to 2005



Source: Labour Force Survey Microdata Service

previously been employed in professional occupations, associate professional and technical occupations and managers and senior officials exhibited the lowest inactivity rates.

A number of conclusions can be drawn from the whole of these findings. Albeit small, there was evidence of increased labour market polarisation between 1995 and 2005 for men, while women experienced general gains in wages over time. That is, the share of men earning 80% of the median income and those earning more than double the median increased between 1995 and 2005, while men earning wages slightly above median decreased over time. For women, decreases in the lowest wage categories were evident between 1995 and 2005. There was little change in the employment share around the median for women and increases in employment share in higher paying jobs. Exploring occupational

shifts among low and high earners revealed net increases in the percentage of low-earning men employed in elementary occupations, low-earning women employed in personal services and low-earning men and women in sales and customer service positions. High earners, on the other hand, were most likely to be employed as managers and senior officials between 1995 and 2005. These popular occupations are characterised by their non-routine nature. Several of the occupations for high-earning women in 2005 are likely within the public sector including teaching professionals and medical practitioners. Analyses revealed that there was a 13% increase in the proportion of female knowledge workers who worked in the public sector between 1995 and 2006. Further, we saw some support for Autor, Levy and Murnane's (2003) contention that computing technology replaced workers engaged in routine tasks as declines in administrative jobs, skilled trades and process, plant and machine operatives were seen across all wage groups.

Findings on unemployment and inactivity by last occupation revealed that even in the face of increased employment share among men in elementary occupations and women in sales and customer services at the low-end of the labour market, unemployment was also quite high. These findings suggest that the supply of unskilled work may not meet the demand. Unemployment and inactivity ratios in 2005 were lowest among knowledge workers.

Next, we turn to the question of whether or not workers are overqualified for the jobs they have as well as the types of jobs available to less skilled workers in the knowledge economy.

Does the knowledge economy effectively and efficiently use its supply of skilled workers?

Some commentators have suggested a potential driver for wage and employment polarisation is an oversupply of graduates to feed the demands of the knowledge economy. The excess supply is forced into jobs that do not demand graduate level skills, in turn displacing those without degrees who subsequently have to take less skilled jobs than in the past. The relative wages and employment opportunities for non-degree holders then worsen over time.

Yet, the evidence is neither conclusive nor straightforward to interpret, as we show below.

One major problem in the debate is that "overqualification" can be defined in different ways and is based on different questions to individuals. Educational or vocational qualifications are often used to proxy workers' skills. However, qualifications are an imperfect assessment of job-specific skills. Some surveys ask respondents whether or not they think their current jobs make full use of their educational qualifications. More sophisticated approaches try and match both employer and individual assessments to get some idea of whether, in aggregate, demand and supply for particular levels of educational attainment across the economy are in balance. Further, "graduate jobs" often imply that a graduate is currently employed in the post, not that graduate skills are needed to complete the required tasks. By and large, much of the extant data has only an assessment of the highest qualification received by participants, which tells us little about how well employees' skills are used in their jobs. Due to data constraints, this limited operational definition of qualification is also used in the present study. Thus, the conclusions we draw are suggestive of overqualification trends in the UK labour market.

Not surprisingly different commentators have taken up quite different positions on the overqualification debate. Keep and Mayhew (2004) have criticised the policy of continued expansion in higher education in England and Wales, citing evidence that both the economic benefits and the demand for graduate labour have been overstated. They posit that if the UK continues to expand the percentage of graduates it churns out, given the social class composition of most graduates, social mobility for adults without degrees will likely decline. Further, it is unclear whether workers should be pushed to achieve a Level 4 when Level 3 qualifications likely suit most jobs.

On the other hand, a recent OECD Policy Brief is equally adamant that investment in higher education is essential if Europe is to meet the Lisbon Council objective of becoming the most dynamic and competitive knowledge economy in the world. The OECD dismisses concerns that expansion of higher education will lead to a decline in the value of degree level qualifications. Their research suggests that earnings for degree holders and other markers of the "value" of education in the labour market have risen faster than the supply since the late 1990s. They conclude that it is the educational institutions that are unable to meet the ever-increasing demand for skills in the workplace.

Although our main focus in this paper is whether there is an oversupply of knowledge workers (proxied as graduates), overqualification can occur at all skills levels. The most authoritative evidence for overqualification in the UK is the Work Skills in Britain Survey (Felstead, Gallie, and Green 2002), the latest being held in 2001. This report showed that nearly 40% of the workforce was, in some sense, overqualified. Yet, the study suggested that this was primarily a problem among non-graduates, both on the demand side with employers and on the supply side with many people having higher qualifications than their job needed. Indeed, while there are just under 3 millions working age adults without any educational or vocational qualifications, there are nearly 7 million jobs that do not require qualifications. The study also confirmed the existence of "credentialism" such that employers specified higher qualifications than were necessary to do the job, primarily at Levels 1 to 3, and not at higher levels.

The 2004 Workplace Employment Relations Survey (WERS) painted a slightly different picture, as they reported that more degree holders than non-degree holders (56% vs. 42%, respectively) believed their skills exceeded the requirements of their jobs (Kersley et al. 2006). Yet, these data were based entirely on a simple, self-report question. While it is debatable how much weight we should put on conclusions drawn from questions such as the one used in WERS, the findings are more consistent with a demand side problem than a supply side problem.

A recent international study by researchers at Essex University illustrates how wide the possible range of estimates can be depending on the definition and methodology used to assess overqualification (Brynin, Lichtwardt, and Longhi 2006). In the study, estimates of overqualification ranged between 33% and 56% of the workforce in the UK. Further, among overqualified respondents, the incidence was more acute among non-graduates (69%) than graduates (25%). In Germany, on the other hand, graduates and adults with lower-level qualifications were equally likely to be overqualified, while adults with higher-level, non-degree qualifications were the most likely. In both countries, however, it appeared that the expansion of higher education was not the sole driver of overqualification as some degree of overqualification was found at all educational levels. As such, the authors conclude that the source of overqualification likely lies within the educational system, and not within the labour market.

Further international evidence on overqualification comes from a recent OECD report that estimated that the UK's overqualification rate was just 15% in 2003-2004 (OECD 2006). Although much lower than some UK estimates, the OECD figures suggests that overqualification was a bigger problem in the UK than in most other EU economies. The UK ranked fifth out of the 21 economies examined, behind Australia, Spain, Ireland and Belgium, but ahead of the US, Canada, Germany, France and Italy (see Table 7). Unfortunately, the OECD estimates do not distinguish between graduates and non-graduates.

Overqualification and wages

An over-supply of graduates, should, all things being equal, drive down graduate wages compared with non-graduates. Yet by international standards, the UK has very high private returns to higher education (measured as the net increase in average earnings attributed to investing in a degree or equivalent), which is not consistent with excess supply. Further, a recent Bank of England analysis found that graduates in 2002 received 80% more on average in hourly pay than those with no qualifications, almost exactly the same rate as in 1975. Thus, demand for graduate workers appears aligned with increases in supply. Another argument is that graduates may be moving into lower paid non-graduate jobs as a result of over-supply. As such, we might expect UK graduates to be concentrated in low paying jobs. There is also the possibility that there is increasing wage polarisation within graduates. That is, graduates with degrees from prestigious educational institutions likely command accelerating wage premiums because of inelastic supply. On the other hand, graduates with degrees from institutions not highly regarded by employers may find their relative wages falling over time.

To explore these hypotheses, we are able to determine whether the education premium has increased over time by exploring changes in the wage structure within qualification categories. To do so, we divided the sample used in Table 1 into adults who completed a Level 2 qualification or less (GCSE or equivalent) or less, those who finished a Level 3 qualification (A levels or equivalent) and Level 4 qualifiers (degree holders) and explored variation in wages within each educational group. Findings are presented in Table 4.

Among men who completed a Level 2 or less, we see almost no change in employment share at the very bottom-end of the earnings scales and an increase in the share of jobs at 80% and 100% of the median between 1995 and 2005. Sizable declines in the percentage of men earning 120% to 160% of the median were also apparent, indicating that men with low educational attainment are more likely to work in jobs that pay median or slightly below the median wages today than 10 years ago. There were few changes over time at the very top-end of the earnings scales.

Shifts over time in employment share among men who completed a Level 3 were quite similar to those described above with the exception of a sizeable decrease in the percentage of men earning the very lowest wages. Here again, we see large growth in jobs earning 80% of the median and, to a lesser extent, at the median. Further, there were some declines is employment share at 120%, 160% and 180% of the median categories, coupled with a small increase at double the median. By and large, the changes over time suggest that relative to 10 years ago, men today are more likely to earn median wages and less likely to earn extremely low wages. Yet, they are also less likely to earn wages above the median in 2005 relative to 1995. Overall, it does not appear that men were worse off in 2005 relative to 1995 as the decreased percentage of men earning the very lowest wages balances out the decrease in the percentage of men earning 120% to 180% of the median.

Among male degree holders, we once again see increases in the proportion of men earning just under the median and median wages. Here we also see a small increase in employment share within the lowest wage category (<60% of median). The concomitant large increase at the top-end earning range of the labour force in 2005 coupled with declines in the share earning 140% to 180% of the median, suggests growing polarisation for male degree holders, with more graduates employed in either poorly paid or well-paid jobs.

Table 4. Change in employment share within educational qualification categories by wage, 1995 to 2005

	Males			Females		
	Percentage distribution		Change	Percentage distribution		Change
	1995	2005	Difference	1995	2005	Difference
Level 2 or below						
≤60% of median	17.23%	16.76%	-.47%	22.11%	19.04%	-3.07%
80% of median	20.52%	24.45%	3.94%	25.43%	25.06%	-.37%
Median	17.92%	20.15%	2.22%	22.32%	24.31%	1.99%
120% of median	16.80%	14.50%	-2.31%	12.85%	13.66%	.82%
140% of median	9.67%	7.39%	-2.28%	6.48%	6.62%	.14%
160% of median	6.05%	5.18%	-.87%	4.29%	3.80%	-.49%
180% of median	4.11%	3.71%	-.40%	2.24%	2.52%	.28%
200% of median	2.55%	2.42%	-.13%	.93%	1.67%	.75%
≥200% of median	5.13%	5.44%	.30%	3.36%	3.32%	-.04%
Level 3						
≤60% of median	9.28%	7.81%	-1.47%	19.34%	17.50%	-1.84%
80% of median	13.80%	17.91%	4.11%	23.05%	25.50%	2.44%
Median	18.71%	19.78%	1.08%	20.33%	21.14%	.82%
120% of median	18.86%	17.32%	-1.54%	14.34%	12.75%	-1.59%
140% of median	12.11%	11.73%	-.39%	8.29%	8.05%	-.24%
160% of median	8.69%	7.76%	-.93%	4.54%	5.42%	.87%
180% of median	5.99%	5.01%	-.97%	3.71%	3.25%	-.46%
200% of median	3.16%	3.84%	.67%	2.32%	2.17%	-.15%
≥200% of median	9.39%	8.84%	-.56%	4.07%	4.22%	.14%
Level 4						
≤60% of median	2.87%	3.53%	.66%	5.20%	5.36%	.16%
80% of median	3.94%	6.02%	2.09%	8.98%	9.04%	.07%
Median	8.54%	9.73%	1.19%	14.06%	14.43%	-.27%
120% of median	11.60%	12.03%	.43%	12.96%	14.74%	1.78%
140% of median	10.99%	10.25%	-.74%	12.59%	11.44%	-1.15%
160% of median	14.41%	10.85%	-3.56%	12.85%	11.58%	-1.27%
180% of median	12.66%	9.33%	-3.34%	8.34%	7.96%	-.38%
200% of median	8.00%	8.01%	.02%	5.11%	5.87%	.75%
≥200% of median	27.00%	30.24%	3.25%	19.89%	19.57%	-.33%

Source: Labour Force Survey Microdata Service

Patterns for employed women were less variable than those reported for men.

Among the least educated women, there was a large decline in the percentage of women employed at the very bottom-end of the earnings scale between 1995 and 2005 as well as a sizable increase in the percentage earning median wages. Modest increases were also apparent at 120% and 200% of the median. These favourable shifts for women with Level 2 qualifications likely reflect their overall improved status within the labour market over the last 10 years. That being said, 44% of women with a Level 2 or below earned less than median wages in 2005.

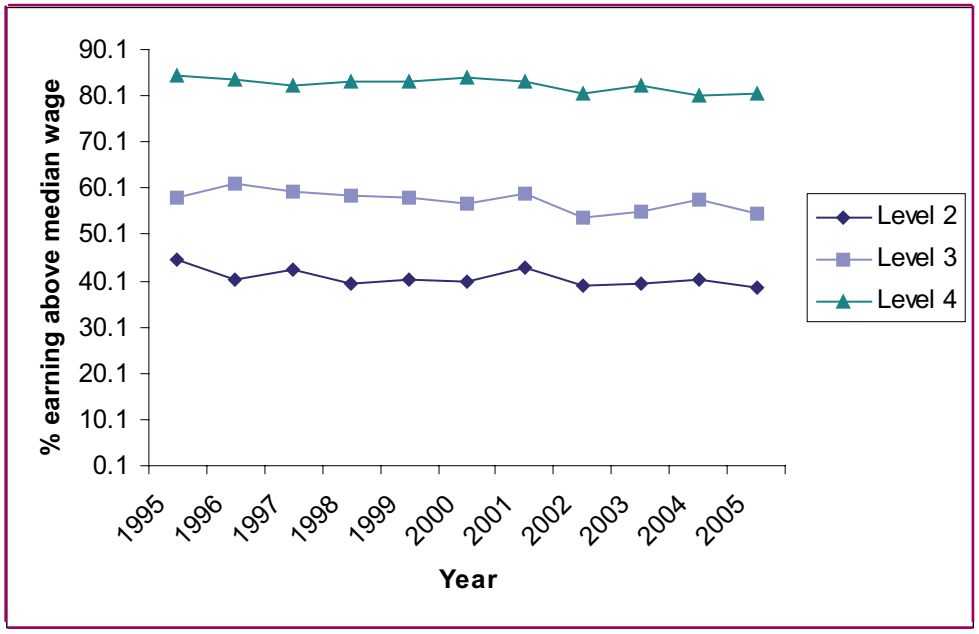
Among women with a Level 3 or equivalent, there was a sizeable decrease over time of employment in the very lowest paid occupations, and increases at 80% of the median and the median. Employment share then declined at 120% of the median (and slightly at 140%), but increased at 160% of the median. Changes among the highest earners were slight. By and large, the strongest changes were for those earning median wages or less, and were favourable for women of today.

Among women with a degree or equivalent, there were few changes over time in employment share for those earning median wages or below. Increases in the percentage of women earning 120% of the median between 1995 and 2005 were coupled with decreases in the share of women earning 140% to 160% of the median. A modest increase was seen among those earning double the median.

Based on these analyses, educational attainment appears to play a moderate role in wage shifts over time. Men with a Level 3 or below were more likely to be earning median wages or lower and less likely to be earning wages above the median today than in 1995. Significant growth at the top-end of the labour market was only seen for male degree holders. Interestingly, there were also increases in the share of low earners among degree holders, suggesting some polarisation of wages within this qualification group. For women with a Level 3 or below, large decreases at the very bottom-end of the labour market were apparent, coupled with increases at the median. The story among graduates was less dramatic and suggested that women were earning similar wages in 2005 relative to 1995. Using our definition of overqualification, these findings do not support the overqualification hypothesis, with the possible exception of male degree holders.

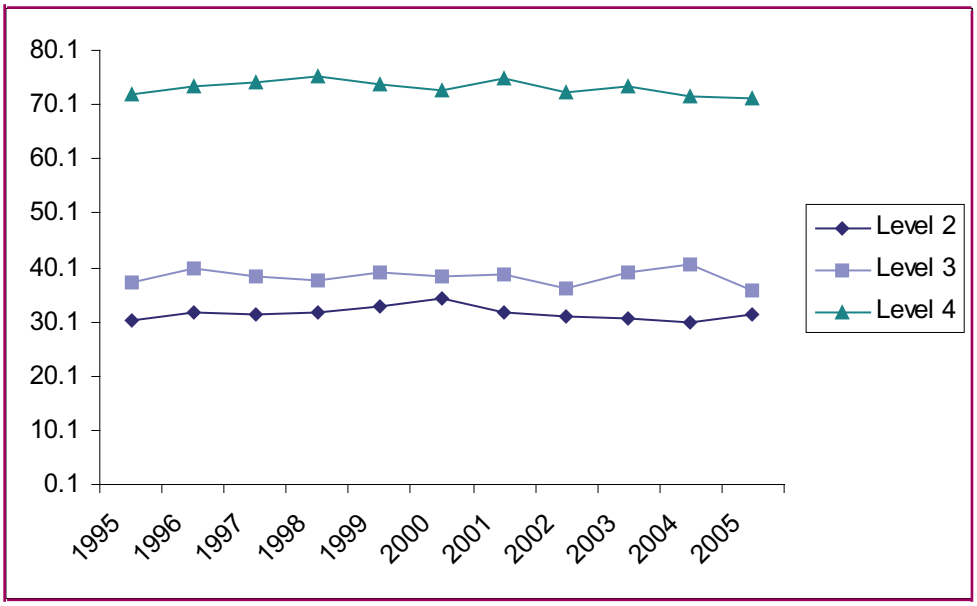
Figures 8 and 9 present the percentage of working-age men and women earning above median wages by educational attainment over the last 10 years. Supporting the findings above, we do not see evidence of overqualification in more recent years. Albeit slight, we do see decreases in the proportion of men with Level 2 qualifications earning wages above the median. That is in 1995, 43% of men with a Level 2 qualification earned above the median relative to 37% in 2005. Women's wages remained relatively stable over time.

Figure 8. Percentage of men earning wages above the median by educational qualification categories, 1995 to 2005



Source: Labour Force Survey Microdata Service

Figure 9. Percentage of women earning wages above the median by educational qualification categories, 1995 to 2005



Source: Labour Force Survey Microdata Service

Overqualification and occupation

Another way to see if overqualification might be increasing is to see if more graduates are being employed in occupations not traditionally associated with degree level employment. As such, we summarised percentage change of degree labour employed within each of the nine major occupational categories from 1995 to 2005 in Table 5 overleaf. Findings are averaged across sex given little variation between males and females.

As seen in Table 5, the share of degree labour increased across all occupations including non-knowledge occupations, notably administrative and secretarial jobs, personal services and sales and customer services.

Table 5. Percentage change in degree labour in 9 major occupational groups

	Percentage distribution		
	1995	2005	Difference
Managers & senior officials	32.69%	42.89%	10.21%
Professional occupations	79.10%	81.65%	2.54%
Associate professional & technical	49.85%	52.70%	2.85%
Administrative & secretarial	13.79%	20.06%	6.26%
Skilled trades occupations	7.00%	9.51%	2.51%
Personal service occupations	10.12%	17.98%	7.86%
Sales & customer service occupations	6.10%	10.16%	4.07%
Process, plant & machine operatives	2.86%	4.80%	1.94%
Elementary occupations	3.42%	5.56%	2.15%

Source: Labour Force Survey Microdata Service

Taken as a whole, our findings might suggest evidence of overqualification. This notion, however, would be inconsistent with the idea that graduate supply and demand are broadly in balance. If our measure of overqualification is accurate, an alternative hypothesis is that our findings are associated with the changing nature of these jobs over time. For example, looking at administrative and secretarial occupations, it is likely that computing technology attenuated the need for many of the more routine positions with this occupational category (e.g., basic bookkeeping and typing). The women who remain in these scarce jobs today likely need degree-level skills to complete their tasks, which may include budget management, supervision, research and high-level communications. Similarly, personal services, which incorporate professional assistants (e.g., nursing assistants, teaching assistants, veterinary assistants, etc.) may be more likely to require degrees today than in the past, or they serve as an entry point for young workers into the labour force. This interpretation is consistent with the evidence that computerisation is increasing skill demands within all occupations.

A second hypothesis is that highly qualified immigrant workers are employed in jobs for which they are overqualified. This may be particularly true among recent Accession workers. This may explain why we see an increase in graduate labour employed in unskilled jobs, a hypothesis we explore in more depth in the

following section. It may also reflect more postgraduate students combining work and study or that retired graduates have come back into employment in low skilled part-time or voluntary posts.

It is also possible that the impact of over-supply is not being felt in wages but through some non-graduates being forced out or denied entry to the labour market altogether. This might show up in a growing gap in employment, unemployment, and inactivity between graduates and non-graduates. Overall, labour market performance since 1995 has been impressive. The working age employment rate has increased from 71.2% to 74.7% in 2005. The unemployment rate fell from 9% to 4.9%. The working age inactivity rate, however, showed relatively little change at 21.8% in 1995 and 21.5% in 2005.

To assess whether graduates are "crowding" non-graduates out of the labour market, we contrasted ratios of employment, unemployment and inactivity by degree status (i.e., degree vs. no degree) to see if the gap between degree and non-degree holders widened or remained stable between 1995 and 2005. Findings are presented in table 6 below.

Table 6. Share of working age population employed, unemployed and inactive by degree status in 1995 and 2005

	1995			2005		
	Degree	Non-degree	Difference	Degree	Non-degree	Difference
Employed	85.64%	68.25%	17.39%	87.50%	70.02%	17.48%
Unemployed	3.70%	7.18%	-3.48%	2.33%	4.62%	-2.29%
Inactivity rate	10.66%	24.57%	-13.91%	10.17%	25.36%	-15.19%

Source: Labour Force Survey Microdata Service

These data were similar for men and women, thus we aggregated across sex. The first notable finding is that more than 85% of degree holders were employed in both 1995 and 2005, which suggests that supply and demand of graduates has remained in balance over the last 10 years. Second, the gap between degree and non-degree holders remains fairly constant between 1995 and 2005 for employed, unemployed and inactive adults. Third, the share of the working age

population who were degree holders and unemployed fell broadly in line with the share of non-degree holders who were unemployed between 1995 and 2005. Yet, the share of the employed or inactive working age population diverged substantially depending on degree status. In both 1995 and 2005, degree holders were more than 25% more likely to be employed than non-degree holders. Among inactive adults, approximately 10% of degree holders were inactive relative to approximately 25% of non-degree holders—an increase of more than double. Thus, these findings suggest that the likelihood of employment for adults without degrees has certainly not worsened over time. Yet, a higher percentage of adults with degrees are employed relative to adults without degrees.

An analysis using the European Labour Force Survey found that in most European countries, employment share of low-skilled workers declined during the 1990s, particularly among older workers. Yet in the UK and the Netherlands, activity rates of low-skilled workers were relatively high. The authors found no evidence that low-skilled workers were crowded out of employment by higher-skilled workers, even among older workers (de Grip and Zwick 2005). In the UK, the activity rate of low-skilled workers was well above the policy target set by the Lisbon agenda.

Overqualification and migration

Migration might be a source of rising overqualification if, for example, highly educated migrants are taking low-level work. Migration has had a significant and beneficial overall impact on the UK labour market over the past decade, but if highly educated migrants are taking basic jobs in the UK to a significant extent that would worsen both the overall overqualification rate and provide further pressure on native non-graduates.

As seen in Table 7, the UK has the fifth highest overall overqualification rate, yet the difference between native- and foreign-born workers was quite small (i.e., 2.3 percentage points, approximately 20% difference). Thus, the impact of overqualified foreign workers on the overall UK overqualification rate appears to be small. However, migrants with high levels of education taking basic jobs may have had a bigger impact on changes in the employment of graduate labour at the bottom end of the labour market.

Table 7. Overqualification rates across the OECD, 2003-2004

	Total	Native-born (A)	Foreign-born (B)	Ratio (B/A)
Spain	25.5%	24.2%	42.9%	1.8
Australia	20.4%	19.0%	24.6%	1.3
Ireland	16.6%	15.7%	23.8%	1.5
Belgium	16.2%	15.6%	21.6%	1.4
UK	15.5%	15.3%	17.8%	1.2
Finland	14.4%	14.3%	19.2%	1.3
US	14.0%	13.4%	18.1%	1.4
Germany	12.3%	11.4%	20.3%	1.8
France	11.6%	11.2%	15.5%	1.4
Austria	11.5%	10.3%	21.1%	2.0
Greece	11.3%	9.0%	39.3%	4.4
Denmark	10.9%	10.4%	18.6%	1.8
Switzerland	10.5%	10.0%	12.5%	1.3
Norway	9.2%	8.4%	20.3%	2.4
Portugal	9.0%	7.9%	16.8%	2.1
Sweden	7.6%	6.5%	16.1%	2.5
Canada	7.2%	7.2%	13.2%	2.2
Italy	7.0%	7.0%	23.5%	3.6
Hungary	6.4%	6.4%	9.7%	1.5
Czech Republic	5.2%	5.2%	10.0%	1.9

Source: Recent Trends in International Migration, table 1.11, p. 54, OECD 2006

We explored possible overqualification among workers in the UK who originally came from the Accession 8 (A8) countries including the former Czechoslovakia, Yugoslavia and USSR. While there was not substantial data on workers from these countries, our analysis revealed that the percentages of degree holders in each of the nine major occupational categories in 2005 were roughly similar to those for UK workers as a whole (as presented in Table 5), with one exception: administrative and secretarial positions, whereby workers from the A8 countries were more likely to have degrees relative to the UK as a whole. It is likely that better data on workers from the A8 countries would provide more revealing findings.

A recent study using LFS reported that overqualification was evident for all migrant groups (not just those from A8 countries) relative to native Whites, with the exception of male Black Caribbean immigrants (Lindley and Lenton 2006). These native and non-native differences tended to dissipate over time. The returns to over-education on earnings were greatest for native White males, suggesting that immigrants tend to earn less than their British counterparts with the same level of education.

Our analyses on overqualification do not lend themselves to simple conclusions. Also, we are aware that using educational and vocational qualifications to proxy job qualifications is not ideal. Thus, our conclusions must be taken in light of our limited measure. On the one hand, we did not find that the gap between degree and non-degree holders expanded over the last decade. Yet, there were sizeable differences in employment and inactivity among degree and non-degree holders, with the former more likely to be employed and less likely to be inactive than the latter. While we did not find concrete evidence that graduates are "crowding" non-graduates out of lower-paid jobs, our analyses did reveal that there was growth towards the bottom-end of the labour market for all men, with the only substantial growth at the top evidenced for degree holders. This pattern was not seen for women. To truly test the overqualification hypothesis, we need to assess alternate hypotheses in more detail. Yet, there are limited extant data that allow for assessment of the influence of migration on overqualification, how occupational skills may have shifted over time and whether heterogeneity in the quality of adults' education plays a role in the overqualification debate. It seems that the UK would be wise to investigate more closely the link between skills expansion (via FE and HE) and employers' usage of skills.

Summary and policy implications

We started with the anticipation that we could deliver some straightforward answers to some straightforward questions about whether the growth of the knowledge economy was bifurcating the labour market in terms of employment opportunities and the wage structure. We also explored whether a contributory factor was an over-supply of knowledge workers (graduates) adversely affecting the employment prospects of non-graduates. The reality turned out to be much more complex.

The knowledge economy gets a reasonably clean bill of health as far as overall polarisation between good and bad jobs are concerned. Overall, we agree with more recent analyses that the story of the 1980s of a disappearing middle and the creation of an hourglass economy has changed to a much more stable labour market, with the main shift being the continued expansion of well-paid jobs at the top. Gender differences, however, continue to play a role as there is some polarisation apparent for men in 2005, but not for women. In particular, we see growth at the bottom-end among men employed in elementary occupations and growth at the top among knowledge workers.

Our overall conclusion is awkward for those who favour the skill-biased technological change (SBTC) argument, whereby computerisation is viewed as a key driver of polarisation and wage inequality. Although polarisation seems to have stabilised, the pace of computerisation certainly has not. At the very least, this shows computerisation must be only one of several factors that are driving labour market inequalities. Policies for women with children and the National Minimum Wage also likely contributed to our pattern of findings.

In terms of overqualification, the balance of evidence favours the interpretation that graduate supply and demand have at the aggregate level remained broadly in balance from 1995 to 2005. In particular, we can find no evidence that either relative wages for graduates or the aggregate returns to higher-level education have fallen.

Having said this, there are some facts indicating inconsistencies in the graduate labour market. In particular, we saw significant growth between 1995 and 2005 among graduates in occupations not typically seen as "knowledge based" work.

This can be linked to growing polarisation for some degree holders, in the sense that graduate employment is expanding in both well-paid and poorly-paid jobs. This can be interpreted as supporting the argument of over-supply. However, this finding only applies to men: there is no evidence of polarisation for female graduates.

There are several possible explanations for our findings. First is a technological explanation, such that computerisation has eliminated many of the less demanding and more routine processing jobs within these occupational groups and enhanced more analytical and complex communication jobs that require graduate level education. This is more consistent with the view that the aggregate supply and demand for skilled labour is in balance across the economy. However, we will need to explore the evidence base for this hypothesis in more depth in the future.

A further factor may be the creation of more entry jobs in occupations such as personal care that are traditionally poorly paid but have become much more demanding as standards have risen. We also suspect migration may also have some influence on the margin, as some high-educated migrants take low-level jobs. Although it appears that migration has only a marginal impact on levels of overqualification in the UK, it may have had a greater impact on change in some basic skill occupations. What is clear is the imbalance between qualifications and job requirements among non-graduates. Many of those with even fairly basic skills appear to be overqualified for the jobs they have to do.

Whatever interpretation we put on these figures, a clear policy priority must be to address the lack of demand for skills and the poor quality of work in the bottom half of the labour market. There is some evidence that while overqualification appears to be a significant factor in many OECD economies (however poorly measured), the economic and social implications may differ and that in turn points to the importance of institutions connecting the labour market and the education system.

Although the expansion of higher education has been criticised as a misallocation of public resources, we note that by international standards the UK is investing

less than the OECD average in higher education and more than the OECD average in the rest of the education system. Spending on vocational training support has increased significantly, albeit more could always be done. The OECD has also highlighted the big problem of unequal access to good schooling across OECD economies. The critics, however, must be surely right to emphasise the need to stimulate the demand side and the need to improve outcomes in terms of the quality of work for non-degree holders.

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