

Article

Analysis of compositional changes in hours worked in the UK

Analysis of the changes in the UK labour composition during and after the economic downturn, and international comparison over the last five years.

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1 . Main points

- Total hours worked fell during the economic downturn of 2008, as a result of falls in the total number of workers and falls in average hours.
- The recovery in total hours worked since the downturn has been driven by increases in jobs; both female and male jobs have made positive contributions to growth in total hours worked; while average hours worked have been broadly flat.
- The post-downturn growth in hours worked has been disproportionately driven by workers who are 50 years or older and by workers with degrees.
- Compared with women, men work a larger share of hours in the UK, however there has been gradual growth in the share of hours worked by women.
- Females and degree holders made positive contributions to growth in hours worked in every industry over the last five years.
- International comparisons of labour composition shows that there are similarities between UK and France.

2 . Introduction

Movements in the labour market are closely linked to productivity. Labour productivity which looks at output per hour worked is one of the factors affecting wage growth, as in the long run, wage growth is expected to track productivity growth. Growth in labour productivity and wages have been relatively muted over recent years, despite rapid growth in employment and corresponding falls in unemployment. This has focussed attention on more detailed features of the labour market including flows into and out of employment and compositional characteristics of the workforce. This article uses a unique labour market dataset to explore recent movements in jobs and in total and average hours worked from a compositional perspective.

The dataset used in this article is from our Quality-Adjusted Labour Input (QALI) system. [QALI](#) uses the Labour Force Survey (LFS) and the Annual Survey of Hours and Earnings (ASHE) data. At the aggregate, whole economy level this is fully consistent with total jobs and hours worked as measured by the LFS. It is also fully consistent with the industry breakdown¹ of jobs and hours worked used in our [Labour Productivity](#) estimates. But additionally, the QALI dataset can be used to break down jobs and hours worked by age group, gender, and highest level of education (and any combination of these categories).

Users should note that this release uses natural log changes instead of discrete percentage changes in the charts to show contributions to growth. The use of log changes allows decomposition of growth in hours to be additive. More information on log changes can be found in [Simple guide to MFP](#).

Notes for: Introduction

1. Benchmarking of jobs and hours worked at industry level means that QALI estimates by age group, gender and education will not necessarily match equivalent estimates from the un-benched LFS.

3 . During the downturn firms adjusted their labour inputs by cutting the number of jobs and changing the working pattern of some of their workers

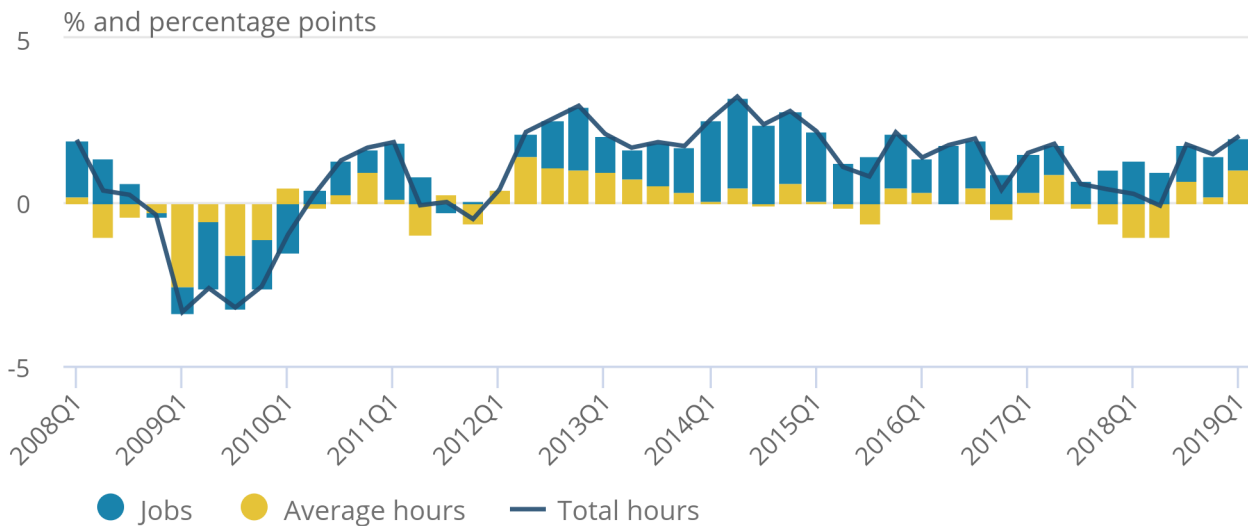
Figure 1 breaks down the contribution to growth in total hours worked by average hours and number of jobs. During the 2008 to 2010 economic downturn, both the number of jobs and average hours worked fell. This shows that firms responded to the downturn by shedding jobs and by changing the working patterns of some workers.

Figure 1: Economic downturn saw a fall in both jobs and average hours

Contributions to growth in total hours worked, by jobs and average hours, quarter-on-quarter a year ago, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 1: Economic downturn saw a fall in both jobs and average hours

Contributions to growth in total hours worked, by jobs and average hours, quarter-on-quarter a year ago, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

- Contributions may not sum to total due to rounding.

The growth in total hours worked started to recover from the downturn in 2010. The post-downturn recovery in the growth in total hours worked has been driven by jobs while there has been relatively little variation in average hours worked. [In Quarter 1 \(Jan to Mar\) 2019](#), the quarter-on-quarter a year ago growth in hours worked was 2%, which is faster than the average post-downturn growth rate of 1.2%. While the total hours worked in the UK have been growing, UK productivity growth has been sluggish and described as a "[UK productivity puzzle](#)".

4 . Post-downturn, both females and males have made positive contributions to growth in total hours worked

Growth in total hours worked can be broken down by gender. Figure 2 shows that during the downturn, both females and males experienced a fall in average hours and in jobs.

Since the downturn, there has been a significant increase in jobs for both women and men and the [employment rate for women hit a record high of 72% in early 2019](#). Despite the record high employment rate, the share of total hours worked by women has increased very gradually since the downturn from 38.8% in Quarter 1 2008 to 40.1% in Quarter 1 2019. This reflects the fact that even though female participation in the labour market has been increasing, women are more likely to work part-time, [as women account for over 70% of part-time employment](#).

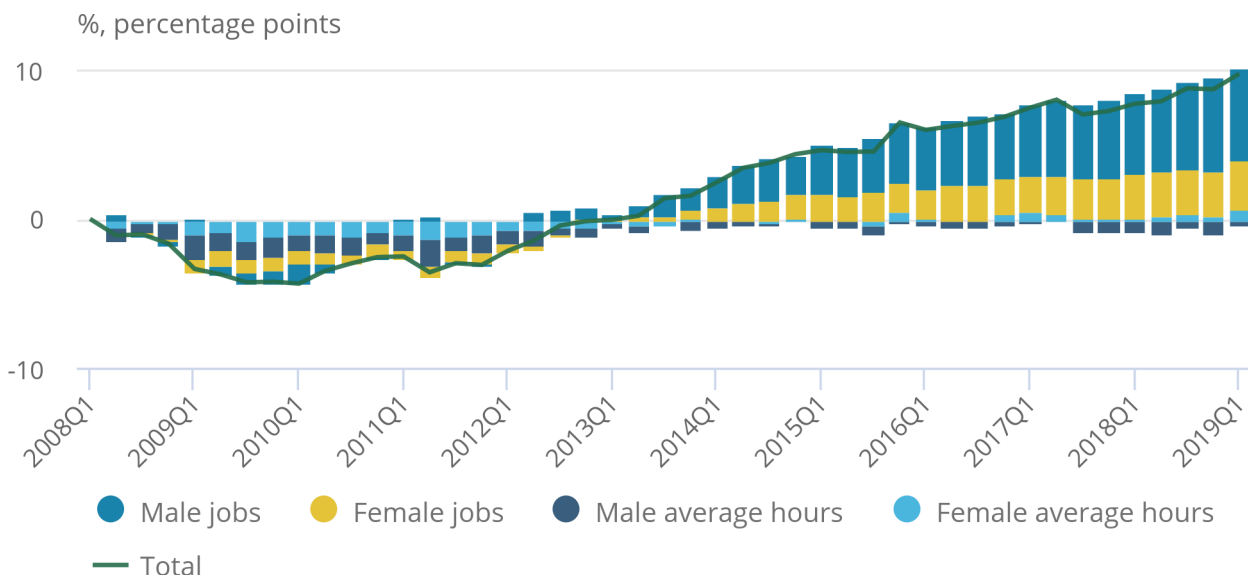
During the downturn, men saw reductions in their average hours worked. However, when the growth in total hours worked started to recover from the downturn, average hours for men remained as the only negative contributor. One explanation for this could be an increase in the share of part-time employment for males.

Figure 2: Both female and male jobs have made positive contributions to growth in total hours worked since the downturn

Cumulative contributions to growth in total hours worked, by jobs and average hours, men and women, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 2: Both female and male jobs have made positive contributions to growth in total hours worked since the downturn

Cumulative contributions to growth in total hours worked, by jobs and average hours, men and women, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

- Contributions may not sum to total due to rounding.

5 . Over fifty-year olds have made the largest contribution to post-downturn growth in total hours

[The life expectancy](#) in the UK had been increasing up until 2015 and since then it has flatlined, while [the birth rate has been falling](#). This has led to an aging population which is reflected in the share of hours worked by older age groups. The share of hours worked by workers aged 50 years or older has risen from 25% in 2008 to 30% in 2018. However, the increasing share of older workers during the downturn was not entirely caused by the aging population. Young workers saw the largest reduction in jobs, leading to a compositional shift in the labour force towards older workers. [This shift could have had a positive impact on productivity](#) as broadly speaking, older workers are likely to have accumulated more work experience than their younger colleagues and therefore are likely to be more productive. However, this relationship might not always hold.

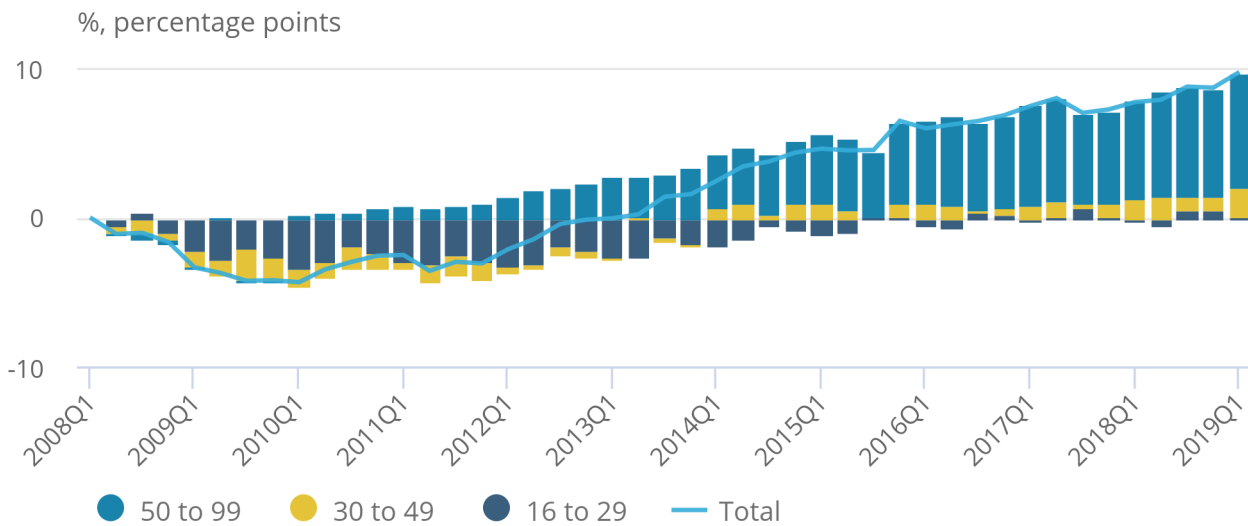
Figure 3 shows breakdown of the growth in total hours worked by age. The data show that workers aged 50 years and over made the largest positive contribution to growth in total hours worked post-downturn. Once the economy started to recover from the downturn, the 30 to 49 years age group started to have a positive contribution to growth in total hours worked, whereas the youngest age group only started to have a positive contribution during more recent quarters. Since the downturn, the youngest age group made the largest positive contribution in Quarter 1 (Jan to Mar) 2019.

Figure 3: Decline in growth in total hours worked during the downturn was largely driven by younger workers

Cumulative contributions to growth in total hours worked, by different age bands, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 3: Decline in growth in total hours worked during the downturn was largely driven by younger workers

Cumulative contributions to growth in total hours worked, by different age bands, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

- Contributions may not sum to total due to rounding.

Figure 4 shows that the growth in total hours worked in the 50 years and older age group has had an upward trend. The contributions to growth in total hours worked by gender in the oldest age group has been quite even. However, the share of total hours worked in the 50 years or older age group by men has fallen from 63% in Quarter 1 2008 to 59% in Quarter 1 2019.

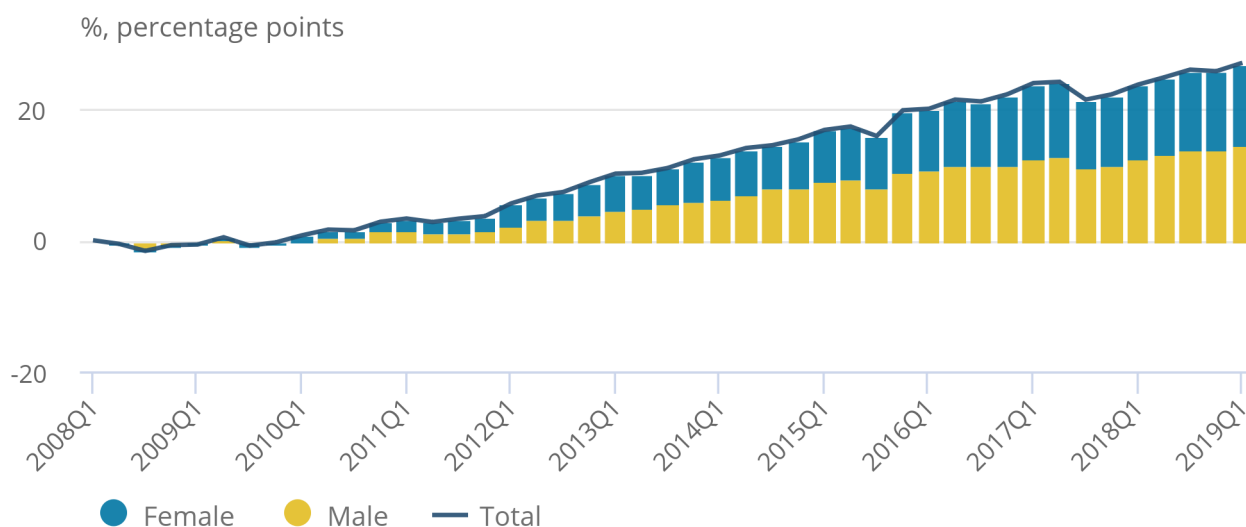
There have been changes in the UK labour market that have been driving the change for older workers. The oldest age group of workers has been affected by the changes in the State Pension age (SPA). The new legislation has increased the SPA for women from 60 to 65 years. [The SPA Act has gone through three changes since 2007 and after each change, the economic activity rate for older women accelerated.](#)

Figure 4: Growth in total hours worked for the oldest age group has had an upward trend since the downturn

Cumulative contributions to growth in total hours worked by 50 years and older age group and gender, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 4: Growth in total hours worked for the oldest age group has had an upward trend since the downturn

Cumulative contributions to growth in total hours worked by 50 years and older age group and gender, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

1. Contributions may not sum to total due to rounding.

6. Workers with degrees made the only positive contribution to growth in total hours worked during the downturn and have been the largest contributors to growth in total hours worked since then

Figure 5 breaks the growth in total hours worked by highest level of qualification (HQ). It shows that during the downturn, workers with lower qualifications saw the largest reduction in hours. Workers whose highest-level of qualification was either HQ5 (degree or equivalent) or HQ6 (post-graduate or equivalent) have made the largest positive contributions to the post-downturn recovery in growth of hours worked. This reflects a shift in the UK labour composition towards more highly educated workers. The share of hours worked by workers with undergraduate or post-graduate degrees has increased from 25% in 2008 to 35% in 2018, while the share of hours worked by workers with no qualifications or GCSEs fell from 42% to 34% over this period.

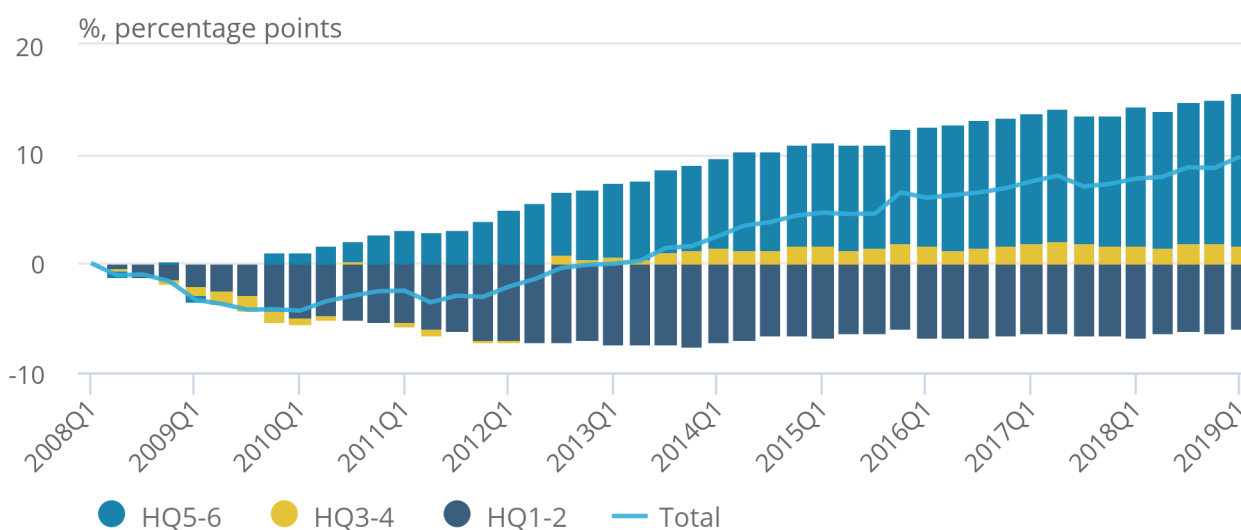
Educational attainment is expected to be correlated with the skills of workers, and therefore as the workforce shifts towards more educated workers it also shifts towards being a highly skilled workforce. Other things being equal, this improvement in the labour composition over time would be expected to lead to growth in economic output and in output per hour. As noted earlier, labour productivity growth has been weak by historical standards so the shift towards highly educated workers exacerbates the productivity puzzle.

Figure 5: Workers with degrees have made the largest contribution to growth in total hours

Cumulative contributions to growth in total hours worked, by different qualifications, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 5: Workers with degrees have made the largest contribution to growth in total hours

Cumulative contributions to growth in total hours worked, by different qualifications, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

1. HQ1 is No qualifications.
2. HQ2 is GCSEs and equivalent.
3. HQ3 is A-levels or trade apprenticeships.
4. HQ4 is Certificates of education or equivalent.
5. HQ5 is First and other degrees.
6. HQ6 is Masters and doctorates.
7. Contributions may not sum to total due to rounding.

Even though degree holders have been the largest driver for the growth in total hours, there are differences in the share of hours worked by highest education level and gender. In 2018, 39% of the hours worked by women were worked by women with undergraduate or post-graduate degree, whereas the same figure for men was 32%.

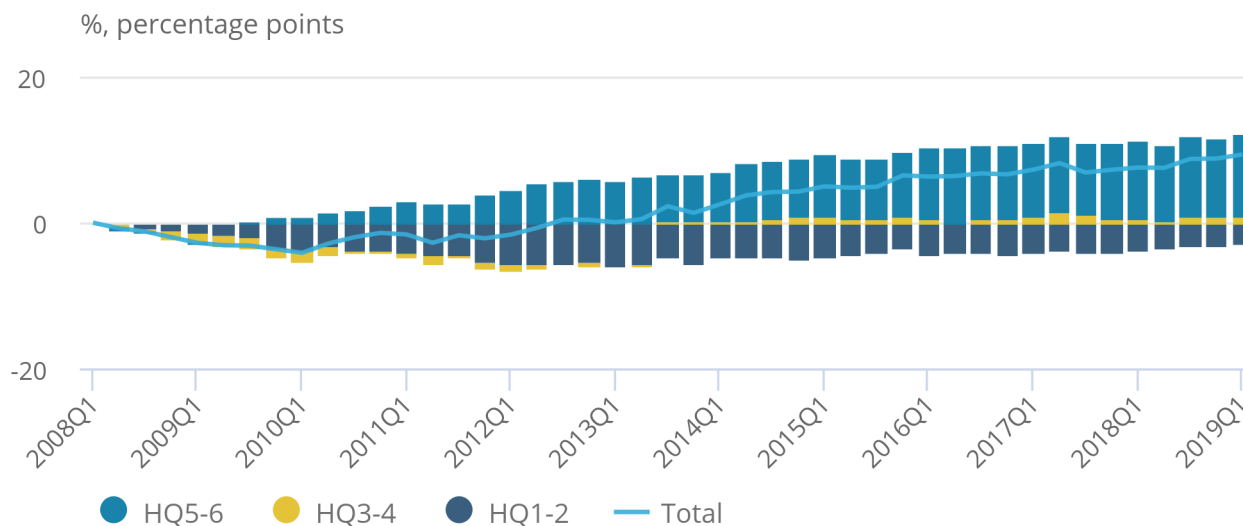
Figure 6 shows that hours worked by males in the lowest HQ1 (no qualifications) and HQ2 (GCSE or equivalent) group have made a negative contribution to growth in total hours worked for men for the whole period while the highest education group have had a positive contribution. Since Quarter 1 (Jan to Mar) 2008, the share of hours worked by males in the lowest educational groups fell from 41% of total hours worked by men to 35% in Quarter 1 2019. This reflects the ongoing shift in the UK labour market towards more educated workers.

Figure 6: There has been a substantial increase in hours worked by males who hold degrees or higher degrees

Cumulative contributions to growth in hours worked by males and education, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 6: There has been a substantial increase in hours worked by males who hold degrees or higher degrees

Cumulative contributions to growth in hours worked by males and education, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

1. HQ1 is No qualifications.
2. HQ2 is GCSEs and equivalent.
3. HQ3 is A-levels or trade apprenticeships.
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5. HQ5 is First and other degrees.
6. HQ6 is Masters and doctorates.
7. Contributions may not sum to total due to rounding.

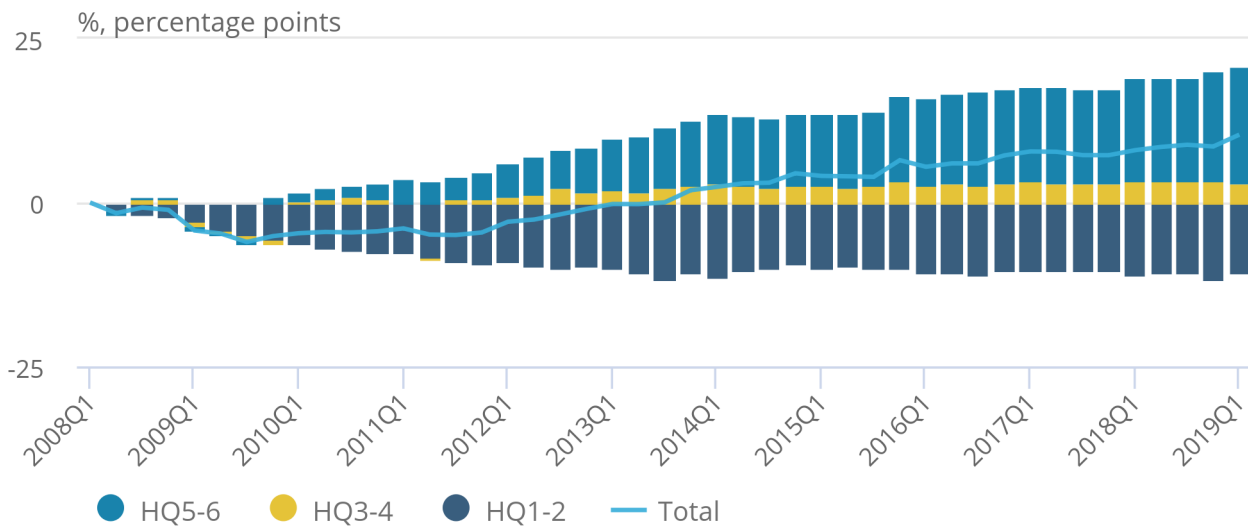
Figure 7 shows the corresponding compositional changes in the growth in total hours worked by women. Since the downturn, the HQ1 (no qualifications) and HQ2 (GCSE or equivalent) group have made a negative contribution to growth in hours worked by women. The post-downturn shift towards the higher education groups HQ5 and HQ6 is more pronounced for women than for men. Like men, women have also experienced a fall in the share of hours worked by the lowest education group from 46% in Quarter 1 2008 to 33% in Quarter 1 2019.

Figure 7: There has been a substantial increase in hours worked by females who hold degrees or higher degrees

Cumulative contributions to growth in hours worked by females and education, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK

Figure 7: There has been a substantial increase in hours worked by females who hold degrees or higher degrees

Cumulative contributions to growth in hours worked by females and education, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

1. HQ1 is No qualifications.
2. HQ2 is GCSEs and equivalent.
3. HQ3 is A-levels or trade apprenticeships.
4. HQ4 is Certificates of education or equivalent.
5. HQ5 is First and other degrees.
6. HQ6 is Masters and doctorates.
7. Contributions may not sum to total due to rounding.

7 . The recovery in total hours worked from the downturn differs across industries

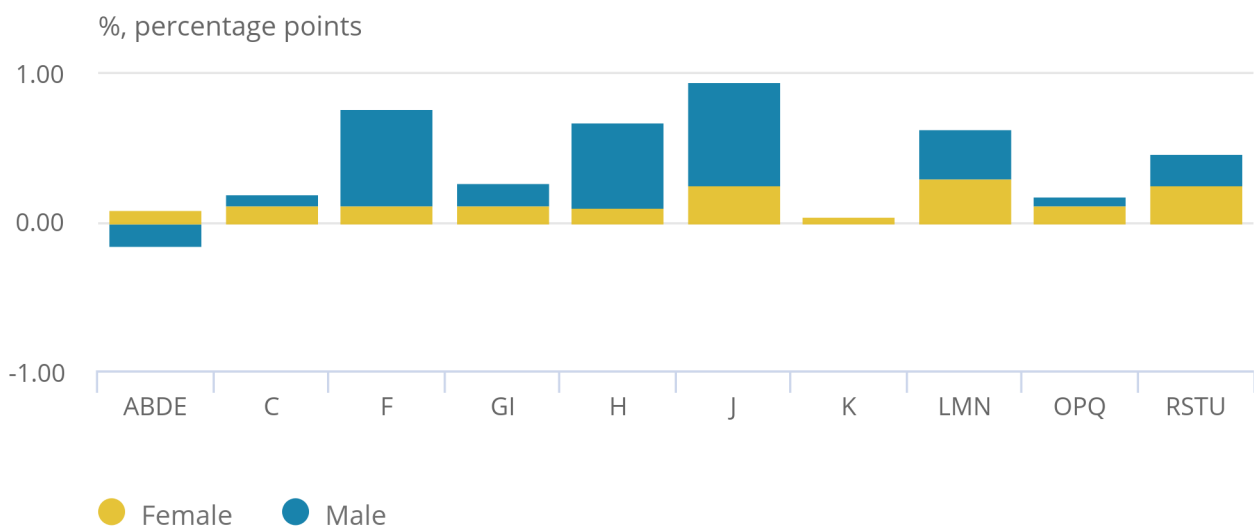
Figure 8 shows that the five-year average growth, in total hours worked differs across industries and the contributions to growth by gender varies as well. Industries where men made larger contribution to growth in total hours worked are industries where men have a larger share of hours worked than women. Industry J (information and communication) saw the largest growth in hours worked which was driven by men. Males made negative contributions to growth in ABDE (Agriculture, forestry and fishing; Mining and quarrying; Electricity, gas, steam and air conditioning supply and water supply; and Sewerage, waste management and remediation activities). Women made a positive contribution to growth in hours worked in every industry.

Figure 8: Contribution to growth in hours worked by gender varies across industries

Contributions to growth in total hours worked by industry and gender, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019 UK

Figure 8: Contribution to growth in hours worked by gender varies across industries

Contributions to growth in total hours worked by industry and gender, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019 UK



Source: Office for National Statistics

Notes:

1. ABDE is: Agriculture, forestry and fishing; Mining and quarrying; Electricity, gas, steam and air conditioning supply and water supply; and Sewerage, waste management and remediation activities.
2. C is Manufacturing.
3. F is Construction.
4. GI is: Wholesale and retail trade; Repair of motor vehicles and motorcycles; and Accommodation and food service activities.
5. H is Transportation and storage.
6. J is Information and communication.
7. K is Financial and insurance activities.
8. LMN is: Real estate activities; Professional, scientific and technical activities; and Administrative and support service activities.
9. OPQ is: Public administration and defence; Compulsory social security; Education; and Human health and social work activities.
10. RSTU is: Arts, entertainment and recreation; and Other services.
11. Contributions may not sum to total due to rounding.

Degree holders made positive contribution to growth in hours in every industry

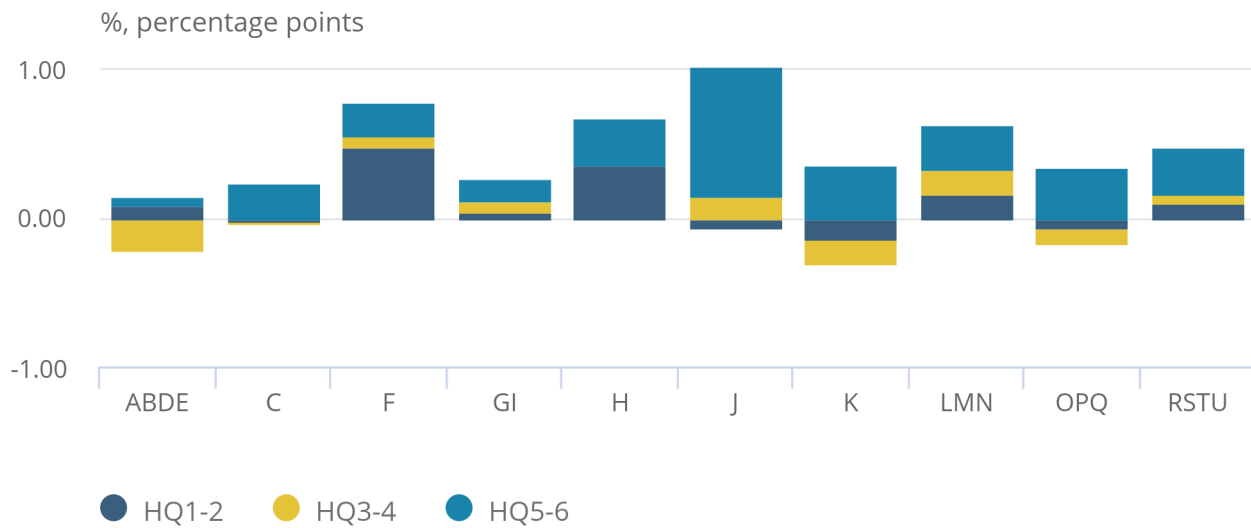
Contribution to growth in hours worked by education group varies across industries. Degree holders made positive contribution to growth in total hours worked in every industry while the contributions made by the two other education groups varies across industries.

Figure 9: Contributions to growth in hours worked by education vary between industries

Contributions to growth in hours worked by industry and education, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019, UK

Figure 9: Contributions to growth in hours worked by education vary between industries

Contributions to growth in hours worked by industry and education, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019, UK



Source: Office for National Statistics

Notes:

1. ABDE is: Agriculture, forestry and fishing; Mining and quarrying; Electricity, gas, steam and air conditioning supply and water supply; and Sewerage, waste management and remediation activities.
2. C is Manufacturing.
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4. GI is: Wholesale and retail trade; Repair of motor vehicles and motorcycles; and Accommodation and food service activities.
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9. OPQ is: Public administration and defence; Compulsory social security; Education; and Human health and social work activities.
10. RSTU is: Arts, entertainment and recreation; and Other services.
11. HQ1 is No qualifications.
12. HQ2 is GCSEs and equivalent.
13. HQ3 is A-levels or trade apprenticeships.
14. HQ4 is Certificates of education or equivalent.
15. HQ5 is First and other degrees.
16. HQ6 is Masters and doctorates.
17. Contributions may not sum to total due to rounding.

8 . International comparisons of labour composition

There are differences in the labour composition across European countries in terms of gender and education. This comparison uses data from [Eurostat](#)¹ on workers by gender and education to explore these differences. Eurostat uses International [Standard Classification of Education \(ISCED\) \(PDF, 1.14MB\)](#) to group workers into different education groups.

Figure 10 shows comparisons between UK, France, Germany and Spain in terms of share of workers by education and gender. UK and France have similar shares in terms of female and male workers in the different education groups. Spain has the largest share of male workers with lower secondary education as their highest educational attainment and the lowest share of male workers in the 3 to 4 ISCED education group, which is similar to having A-levels as the highest educational attainment in the UK.

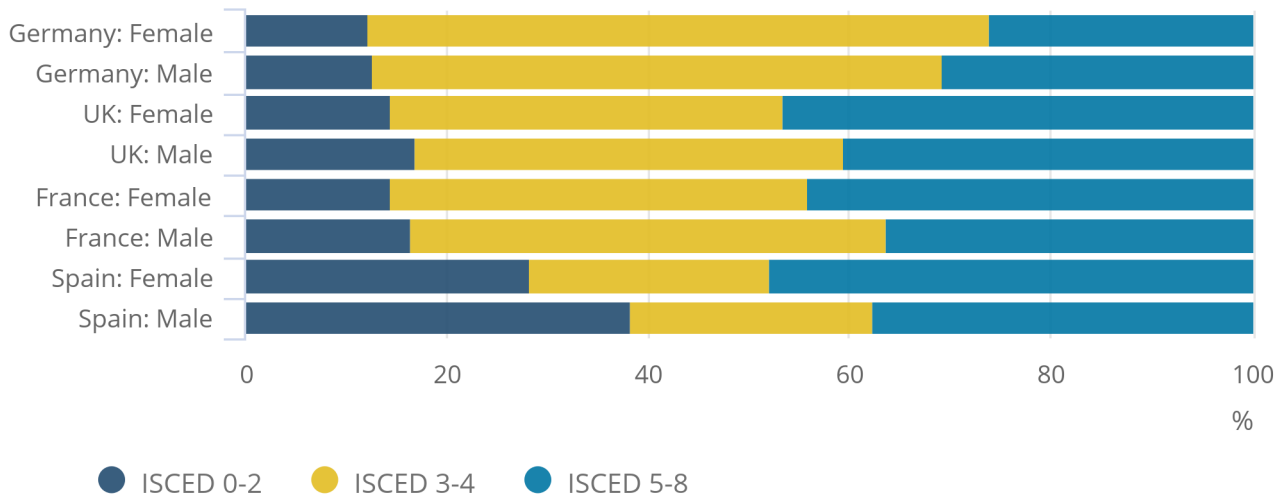
Share of female workers in the three education groups is similar in France and in the UK. Germany has the largest share of female workers in the ISCED 3 to 4 education group and Spain has the smallest. Spain also, has the largest share of female workers with degrees.

Figure 10: Labour composition varies across countries

Share of workers by gender, education and country, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019

Figure 10: Labour composition varies across countries

Share of workers by gender, education and country, five-year average, Quarter 1 (Jan to Mar) 2014 to Quarter 1 2019



Source: Eurostat

Notes:

1. ISCED level 0 – Early childhood education.
2. ISCED level 1 – Primary education.
3. ISCED level 2 – Lower secondary education.
4. ISCED level 3 – Upper secondary education.
5. ISCED level 4 – Post-secondary non-tertiary education.
6. ISCED level 5 – Short-cycle tertiary education.
7. ISCED level 6 – Bachelor's or equivalent level.
8. ISCED level 7 – Master's or equivalent.
9. ISCED level 8 – Doctoral or equivalent level.
10. Five-year average share of male workers: Germany 53%, UK 53%, France 52%, Spain 54%.
11. Contributions may not sum to total due to rounding.

Notes for: International comparisons of labour composition

1. Users should note that Eurostat collects data on labour markets using ([EU-LFS](#)). The education variable in the EU-LFS uses the ISCED classification for the highest educational attainment level. These are slightly different from the education variable used for the UK data in previous sections.

9 . Authors

Amina Syed, Fiona Massey, Piotr Pawelek, Riikka Korhonen, Mark Franklin