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Growing Pains

The impact of leaving education during a recession on earnings and employment

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Summary

The financial crisis led to the biggest recession in living memory: output fell by almost 5 per cent, a bigger drop than in the downturns of the early 1990s or early 1980s. As in previous recessions, younger people bore the brunt of this: the unemployment rate for those aged 18 to 29 rose by 4 percentage points and average real earnings for this group fell by 9 per cent.

Elsewhere we have documented how young people have faced a decade of poor earnings growth and reduced job prospects compared to previous cohorts. This report looks at the specific fortunes of the "crisis cohort" those who left education between 2008 and 2011. By analysing outcomes for those unfortunate enough to enter the labour market in the aftermath of the 2008-09 recession, this paper estimates how severe an impact the downturn had on people who left education in its midst, and how long-lasting these effects were. It is also the first attempt to compare this recession with previous ones, shedding light on how the effects differ and what this can tell policy-makers about how to prepare for future downturns.

We find that people starting their careers in the midst of a downturn experience a reduction in real hourly pay of around 6 per cent one year after leaving education, and that compared to people who left education in better economic conditions their wages do not recover for up to 6 years. For those with lower levels of education, the chance of being in work falls by over 20 per cent, while for graduates the chance of being in a low-paying occupation rises.

In terms of the recent downturn, one of the most novel findings of this paper is that, compared to graduates who left education before or after the downturn, there was a more pronounced rise in people working in lower-paid occupations. The chance of a graduate working in a low-paid occupation rose by 30 per cent, and remained elevated a full seven years later. Indeed, we find that people 'trading down' in terms of the occupations they enter after leaving education, coupled with pay restraint in mid-paid roles, are main drivers of poor pay outcomes for those entering the labour market in a recession.

This helps explain why the impact on pay was more enduring in the recent downturn. People's hourly wages took 50 per cent longer to recover (to the rates of pay enjoyed by those leaving education outside the downturn)

after the financial crisis than in the aftermath of the 1990-91 recession. On the other hand, youth unemployment did not rise as high as in the early 1990s, and came down much faster.

Like previous downturns, the recent recession has severely affected the prospects of those leaving education in its midst. The cohort that graduated in the aftermath of the financial crisis suffered higher unemployment and poorer job prospects than their slightly younger counterparts. Unlike previous downturns, the financial crisis brought with it nominal pay cuts for those starting work in 2008 and 2009, particularly sluggish wage growth and a marked rise in the share of people in low-paying occupations.

This shows that the nature of the challenge has changed. The good news is that fewer young people have experienced the scarring effects of unemployment. The bad news is that a far greater proportion have endured 'occupational' scarring. This matters because time spent in low-paying occupations reduces someone's future earnings prospects, not just because pay progression is weaker in these occupations but also because moving to higher-paying occupations is relatively rare and pay effects do not immediately unwind when (if) someone does. We find that, over the past decade, the typical annual hourly pay rise for someone in a high-paying occupation who had been employed for between one and two years was 54p, far higher than the typical pay rise for someone working in a low-paying occupation (32p). Therefore although unemployment still blights the early careers of many young people – particularly those with lower levels of education – we need to do more to support those who, although avoiding unemployment, have had their earnings trajectories and job prospects damaged by time spent in low-paying work.

Downturns scar younger workers

The 2008-09 recession was the biggest in living memory. The downturn that followed the financial crisis took a particularly big toll on younger people: more than one-in-six 18 to 22 year olds were unemployed in 2012, twice the rate for the population in general. This is consistent with what we know about recessions; their effects are most keenly felt by those least able to bear the impact: the less-educated, those on lower incomes, and – the focus of this paper – the young. A decade on from the downturn we are now in a position to analyse how it affected those entering the labour market in its midst, and what the long-term impacts on these people have been.

There is a body of evidence that shows that leaving education and entering the labour market in the midst or aftermath of a recession is bad for a young person's prospects. This is because recessions mean that fewer jobs are available, that the jobs that are available may be of worse quality, and that firms may engage in wage restraint or cut back on human capital development. Furthermore, recessions do not just affect the choices someone makes immediately after leaving education but can have long-lasting effects.

For instance, research has shown that men who experience an extra three months out of work before the age of 23 go on to experience an additional two months out of work between the ages of 28 and 33.[1] People who experience unemployment are more likely to suffer a wage penalty when they return to work. Estimates put this penalty at approximately 6 per cent, and people who were previously unemployed earn, on average, around 14 per cent less after three years than those previously employed.[2] This is also not just about unemployment. As we show below, returns to tenure in lower-paying occupations are lower than in higher-paying ones, and so someone's earnings trajectory is affected both by whether or not they find a job and the type of job they find.

There are good theoretical reasons why this may be the case. Employers, unable to observe an individual's marginal productivity, may use their employment history as a proxy and so pay those with spells out of work, or time spent in lower-quality work, less. Employers who have monopsonistic power over potential employees may find it easier to drive a harder bargain with these people, and the individuals in question may be more willing to accept lower wages. Finally, spells out of work or in lower-quality employment may result in some loss of skills (or a failure to build up skills) and so these people may be less productive.

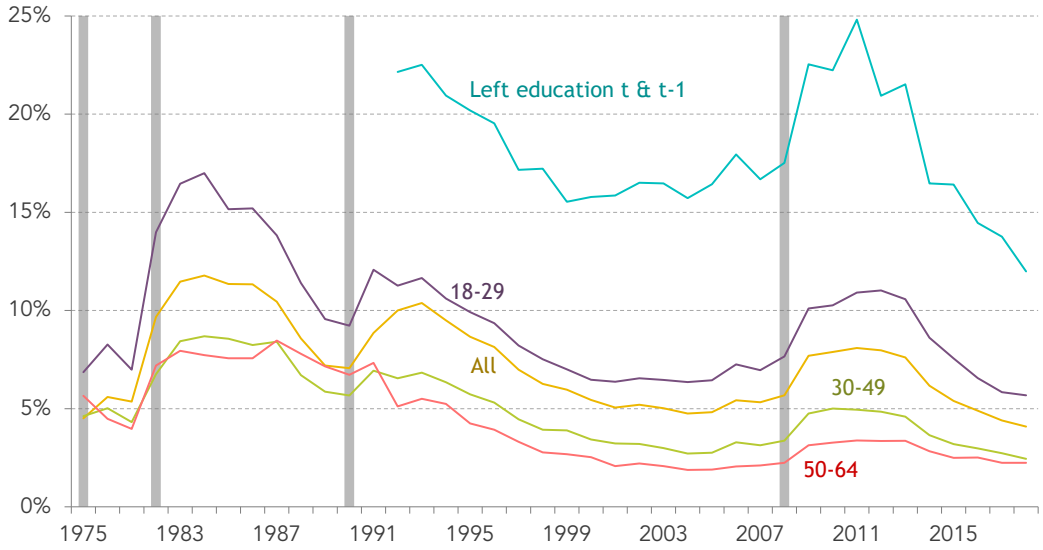
A recession provides an opportunity to identify and isolate these effects, because a recession is - from an individual's point of view – an entirely random event. Some people are unlucky enough to enter the labour market during one, allowing us to separate the impact of the recession from other factors (someone's qualifications, aptitude, work-ethic, etc.) that also influence how they get on in the labour market. By observing what happens to these individuals - are their pay or employment prospects depressed compared to similar individuals who do not enter the labour market during a recession,

[1] P Gregg, '*The impact of youth unemployment on adult unemployment in the NCDS*', *The Economic Journal* 111(475), pp.626–653, November 2001
[2] W Arulampalam, '*Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages*', *The Economic Journal* 111(475), pp.585-606, November 2001

and for how long - we get some sense of the lasting impact that recessions have upon people. Figure 1 shows the last four recessions and their impact on unemployment. It shows the overall unemployment rate, the unemployment rate for people aged 18 to 29, and the unemployment rate for people who left education in the year in question or the previous one.

Figure 1: Recessions push up unemployment for younger age groups and people just leaving education

Unemployment rate, by age and left education within the past two years: UK



Notes: 'All' unemployment rate is for age group 16+.
Source: RF analysis of ONS, *Annual Labour Force Survey* (1975–91); ONS, *Quarterly Labour Force Survey* (1992–2018)

It is clear that unemployment tends to rise after recessions, and remains elevated for some time afterwards. The recent downturn was – despite output falling by more than in the early-1980s recession – less severe in terms of unemployment than previous ones. The unemployment rate in 2012 was 8 per cent, rather than 12 per cent in 1984 and 10 per cent in 1993.

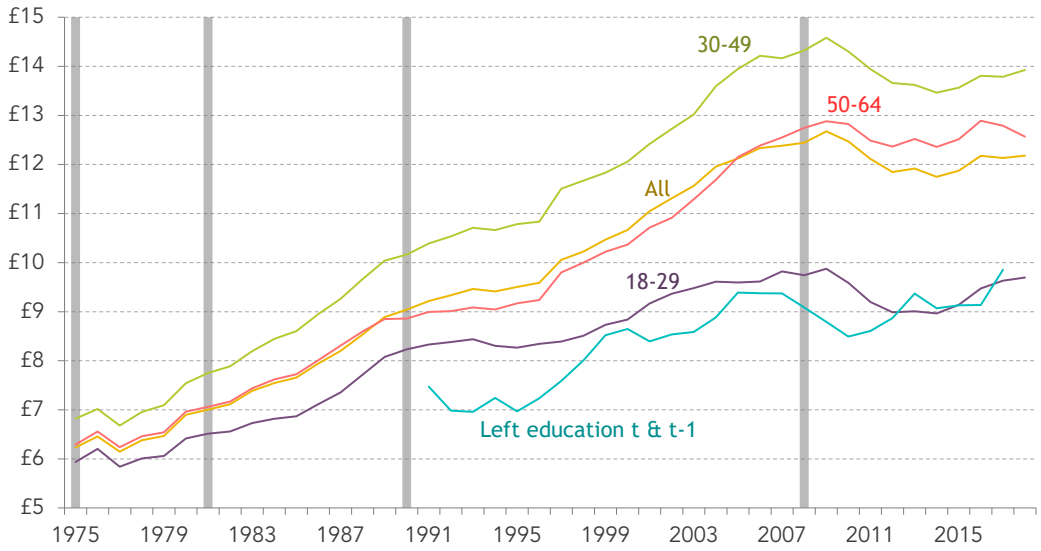
Compared to previous cohorts, particularly those who came of age in the mid-1980s, today's young people are less likely to have been unemployed and so are less likely to have experienced the scarring effects that accompany worklessness. Nevertheless, as Figure 1 shows, around one-in-four of the economically active people who left education in the two years to 2011 were unemployed at that point. In addition, previous Resolution Foundation analysis has demonstrated that, although lower overall, unemployment increases in the most recent recession were more skewed towards young adults than in the past. The 16-29 year old unemployment rate increase was more than double the overall increase following the financial crisis, compared to 65 per cent higher during the early-1980s recession.[3]

[3] Resolution Foundation, *A New Generational Contract: The final report of the Intergenerational Commission*, May 2018

Although the recent downturn had less of an impact on unemployment, the corollary of this was that it had a far more severe impact on pay, as high inflation allowed the economy to adjust via real wage cuts. Figure 2 shows average hourly pay rates for five different groups. Real wages slowed, but mostly continued to rise, in the aftermath of previous recessions whereas the recent downturn was associated with a large fall in real wages. Peak-to-trough overall hourly earnings declined by 7 per cent in the wake of the financial crisis, however the impact on the wages of young people, particularly those just leaving education, was more severe. The real wages of people just entering the labour market declined by 9 per cent between 2007 and 2010, whereas the wages of people aged 50-64 declined by just 4 per cent.

Figure 2: Previous recessions had little impact on average pay

Typical real hourly pay (CPIH-adjusted to 2018 prices), by age and year left education: UK



Notes: 'All' hourly pay is for age group 16+.
Source: RF analysis of ONS, *Annual Survey of Hours and Earnings*/ONS, *New Earnings Survey Panel Dataset* ('All' and age groups); ONS, *Quarterly Labour Force Survey* ('Left education within the past two years')

Comparing cohorts who left education in the midst of a crisis to those entering just before or after provides a good way to test the impact of entering a subdued labour market, because there is no reason to believe that these people are in any way meaningfully different. Therefore, by seeing how outcomes vary for those who left education in 2009 and those who left in 2013 we can get some sense of the impact of the recession.

There are a number of notable papers that use this approach to identify the impact of a downturn on people's future prospects using data from the US and Canada.[4] There has also been some recent work examining the same question in the UK, comparing people

[4] P Oreopoulos, T von Wachter & A Heisz, '*The Short- and Long-Term Career Effects of Graduating in a Recession*', American Economic Journal Applied Economics 4(1), pp. 1–29, 2012; H Schwandt & T von Wachter, '*Unlucky Cohorts: Estimating the Long-term Effects of Entering the Labor Market in a Recession in Large Cross-sectional Data Sets*', NBER Working Paper No. 25141, October 2018; L Kahn, '*The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy*', *Labour Economics*, 17(2), pp.303–16, 2010

who entered the labour market in the aftermath of a recession to those who did so at another time.[5] These studies all reach relatively similar conclusions: they find that recessions tend to have persistent effects on people's wages, while employment effects are limited to, or more severe, for people with lower levels of formal education. There is also evidence that recessions lead to other poor outcomes, such as increasing the likelihood that young people will turn to crime.[6]

This paper goes further in a number of ways. First we specifically test the impact that the recent recession has had on those who entered the labour market in its midst. Our data includes both the aftermath of the early-1990s recession and the build-up to, and aftermath of, the financial crisis, running to 2018. This allows some – albeit limited - comparison of the impact of the 1990s downturn with that of 2008-09. Second, we do not limit ourselves to analysing just wages and employment, but also analyse the types of jobs people are doing, disaggregate our analysis by qualification level, and analyse what happens to the career trajectories of those who come of age in a downturn.

When you enter the labour market matters for your chances of being employed, your pay, and the type of job you do

People who enter the labour market in the aftermath of a recession, when unemployment tends to be elevated, are less likely to find employment. Here we examine employment rather than the unemployment rate to take into account the fact that many younger people may be inactive rather than unemployed. Nevertheless a similar picture emerges for unemployment.

Figure 3 shows the employment rate for two pairs of cohorts. The first pair (denoted by the red and pink lines) left education either at the end of (1991), or four years after (1995) the early-1990s recession. The second (denoted by the purple lines) left education at the end of (2009), or four years after (2013) the recent recession. Cohorts are similar to those we have analysed in previous reports, except here we base our classification on the year people left education rather than the year they were born.[7] The advantage of this approach, for the purposes of this analysis, is that people leave education at different times. So, if our question is the particular impact of entering the world of work in a downturn (as opposed to just experiencing one at some point after entering), it is fairer to analyse what the employment rate is for two people who left education last year rather than two people born in the same year.

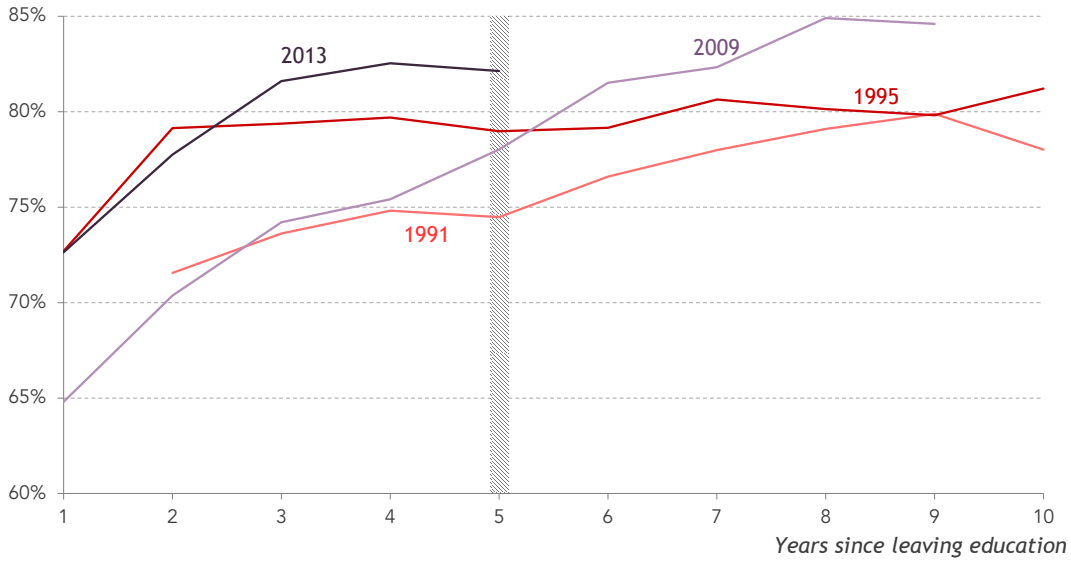
Taking the point five years after leaving education (when most people will have had to enter the labour market and when we have comparable data for all cohorts) it is clear that the two cohorts that left education during a downturn have significantly lower employment rates. The 1991 cohort has the lowest employment rate, followed by those who left education in 2009. Interestingly, the employment rate for the 2013 cohort was

[5] J Cribb, A Hood & R Joyce, *Does leaving education in a recession have a lasting impact on living standards?*, Institute for Fiscal Studies, November 2017
[6] B Bell, A Bindler & S Machin, *'Crime Scars: Recessions and the Making of Career Criminals'*, *The Review of Economics and Statistics* 100(3), pp.392-404, July 2018
[7] See: Resolution Foundation, *A New Generational Contract: The final report of the Intergenerational Commission*, May 2018

also relatively low a year out from leaving education, but rose swiftly over the next four years. Comparing the two cohorts who left education during the downturn to the two who left subsequently, there is still around a 4 percentage point penalty five years after entering the labour market.

Figure 3: Employment rates are lower for cohorts that enter the labour market during or after a downturn

Share of people in employment, by year left education: UK



Source: RF analysis of ONS, *Quarterly Labour Force Survey*

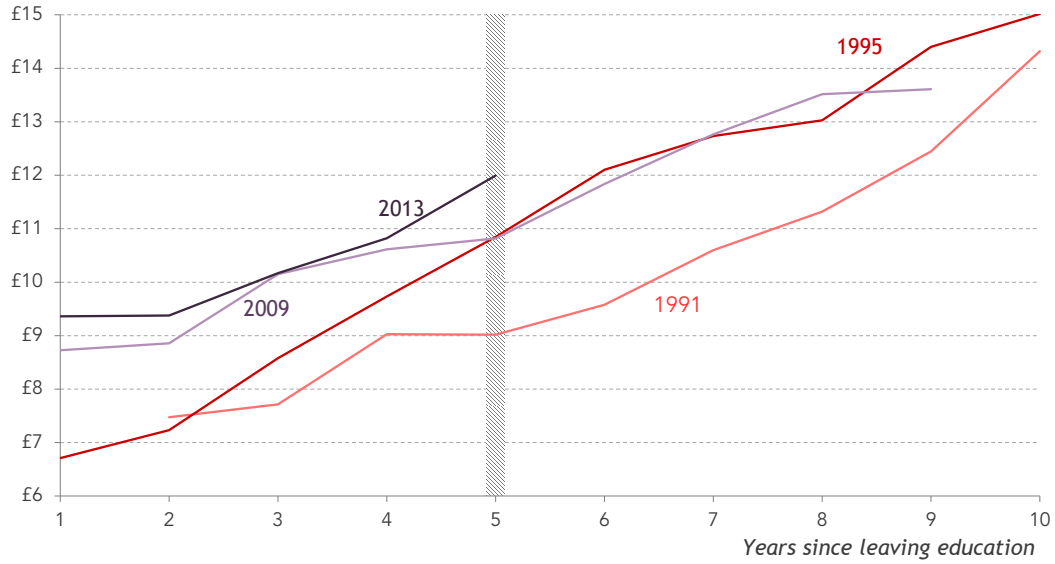
Figure 3 also gives a sense of how long it has taken different cohorts to recover from the effects of the downturn. The 1991 cohort had the lowest employment rate four years after leaving education, and their employment rate only caught up a decade on. By contrast, the fortunes of the 2009 cohort show that the recent recession was a fundamentally different downturn. Although the 2009 cohort initially look similar to the 1990 cohort (despite the recent recession being a lot more severe) the fact that they recovered so much quicker shows that adjustment must have happened elsewhere, as well as reflecting the unexpected rise in employment that has characterised the period since 2012.[8] This leads to the conclusion that employment scarring was less of an issue in the recent recession than it was in the 1990s. But we need to look beyond the chances of just being in work or not to get a sense of the full impacts of starting one's career during the recent recession.

Indeed, there is a contrasting picture when it comes to pay. Again comparing those who left education during downturns to those who entered the labour market four years later, Figure 4 shows that five years after leaving education, the 1995 and 2013 cohorts were earning between £1 and £2 more an hour in real terms than the cohorts who graduated during the recession.

[8] S Clarke & N Cominetti, *Setting the record straight: How record employment has changed the UK*, Resolution Foundation, January 2019

Figure 4: Hourly pay for those who left education in 2009 remains depressed

Typical real hourly pay (CPIH-adjusted to 2018 prices), by year left education: UK



Source: RF analysis of ONS, *Quarterly Labour Force Survey*

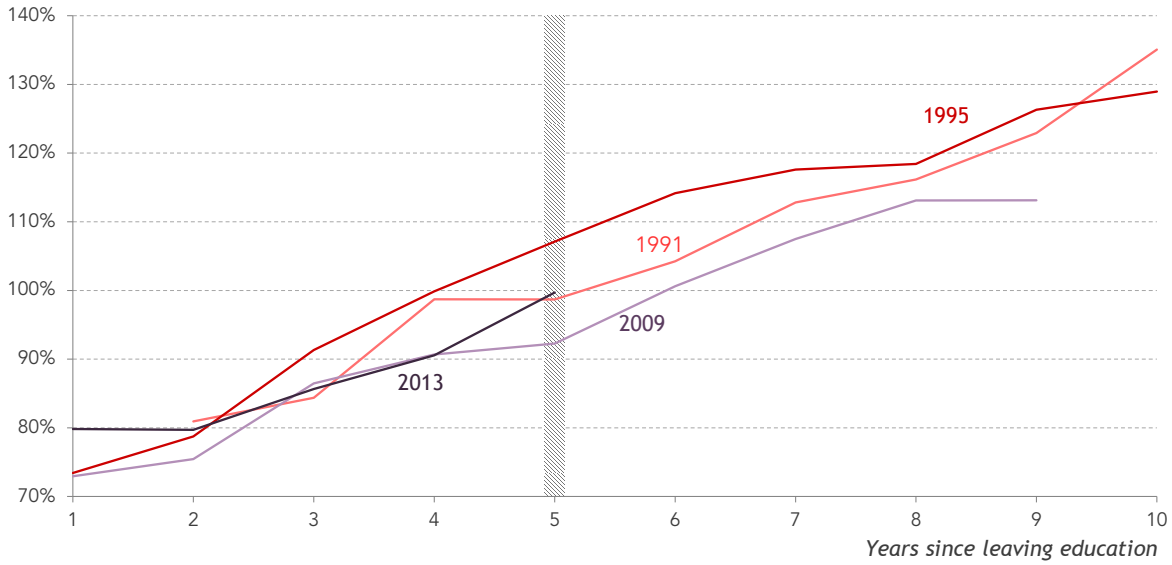
What's also particularly striking is that nine years on from leaving education, the 2009 cohort had lower average earnings than the 1995 cohort, despite the fact that we expect real pay to increase over time. This reflects the fact that the pay squeeze that followed the recent downturn was a lot more severe than that which followed the 1990-91 recession. A large depreciation of sterling in 2008 and the subsequent rise in inflation allowed firms to adjust by cutting real pay, limiting the number of job losses (evident in Figure 3) but leading to a decade of lost earnings growth.[9] Given this, although the trajectory of the 2013 cohort appears marginally better than for those who left education in 2009, pay growth has still been sluggish.

One of the drawbacks of Figure 4 is that it does not take into account the fact that (unlike employment) we expect real pay to increase over time (making the performance of the 2009 cohort even more shocking). Figure 5 shows earnings in the years after leaving education as a proportion of average earnings across the economy as a whole. Five years after leaving education, the 1995 cohort were earning over 8 percentage points more than the cohort that left education in 1991, the 2013 cohort were earning almost 7.5 percentage points more than the 2009 cohort. The lack of progress for the 2009 cohort is only ameliorated by the fact that, taking into account average earnings growth, the 2013 cohort are earning far less than the 1995 cohort.

[9] S Clarke & P Gregg, *Count the pennies: Explaining a decade of lost pay growth*, Resolution Foundation, October 2018

Figure 5: Hourly pay for those who left education following the recent downturn is even lower compared to average earnings

Typical hourly pay as share of average pay across the economy, by year left education: UK



Source: RF analysis of ONS, *Quarterly Labour Force Survey*

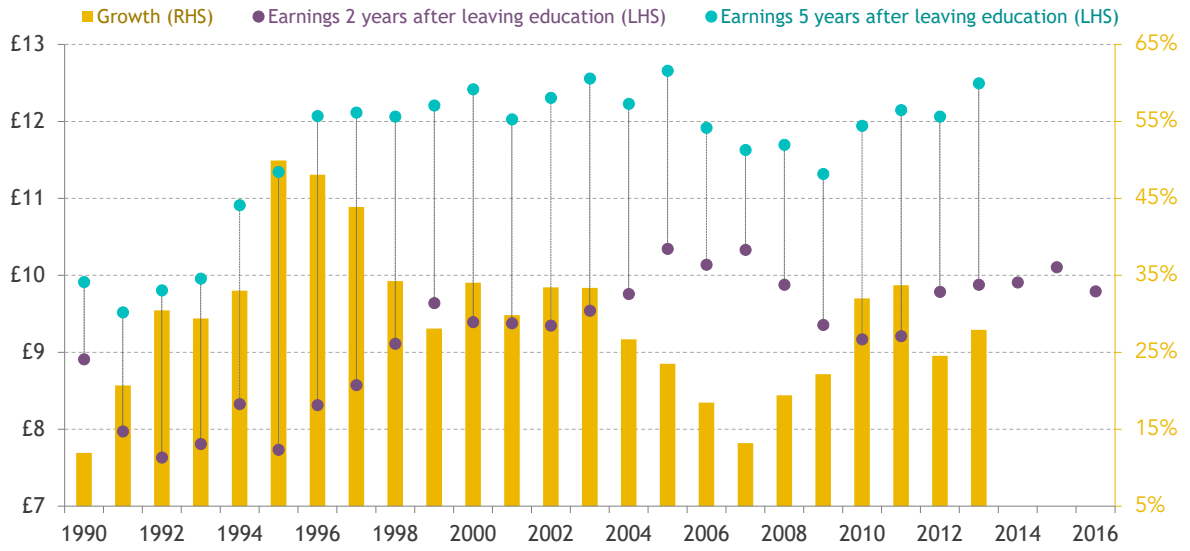
Despite the fact that the past decade has been arguably the worse decade for pay growth since the early 19th century,[10] it has been particularly bad for those who left education during or after the crisis. The cohort that left during the recession (2009) are, relative to average earnings, still earning less than the 1991 cohort nine years on from leaving education, reflecting the fact that there has been a deterioration in the relative position of young people over this period. The 2009 cohort has experienced nearly a decade of subdued earnings growth and there is no sign yet of them recovering to the relative rates of pay enjoyed by people who left education almost two decades before them.

To get a better sense of what has driven these outcomes, we can look at starting salaries and subsequent pay growth. Looking at the wages of people leaving education since 1990, it is clear that either or both of starting salaries, and subsequent pay growth, are lower for people entering the labour market during, or shortly after, a recession. For those who left education in the immediate aftermath of the early-1990s recession, initial earnings were as high for those who left subsequently, however pay growth was lower. However, we know that the early-1990s recession was not a particularly severe one, and the general squeeze on wages was lower than after the 2008-09 recession.

[10] M Whittaker et al., *Are we nearly there yet? Spring Budget 2017 and the 15 year squeeze on family and public finances*, Resolution Foundation, March 2017

Figure 6: Starting salaries and pay growth are lower for those entering the labour market in and around a downturn

Typical real hourly wages (CPIH-adjusted to 2018 prices) and pay growth, by year left education: UK



Source: RF analysis of ONS, *Quarterly Labour Force Survey*

Turning to the recent downturn, it is clear that the starting salaries of people who left education before 2008 were not affected, however pay growth for this group – who would been in the early stage of their careers in the aftermath of the recession – was significantly lower than for previous cohorts. By contrast starting salaries for those who left education between 2008 and 2011 were, in real terms, the same as for those who left education in the late 1990s and early 2000s, and even lower as a share of average earnings. Starting salaries have risen for those who left education after 2011.

Taking the position of people five years after leaving education (turquoise dots) as a fair comparison between the cohorts, it is clear that the cohort that came of age in 2009 has fared worst. While this cohort, like the others who left education around this time, were affected by the post-crisis, and then post-referendum, rises in inflation, this group suffered a further blow. The cohorts that left education in 2008-10 actually had lower nominal starting salaries (averaging £6.70 an hour) than those who left education in 2007 (with average starting salaries of £6.90), suggesting that they were affected by firms engaging in nominal wage restraint in the immediate aftermath of the recession. This is not what happened to the workforce as a whole,[11] and did not happen for cohorts entering the world of work in the early-1990s recession. This double-whammy of very low starting salaries, while also bearing the full brunt of high inflation in subsequent years, diminishing earnings progression, means that 2009 was the worst time to enter the labour market.

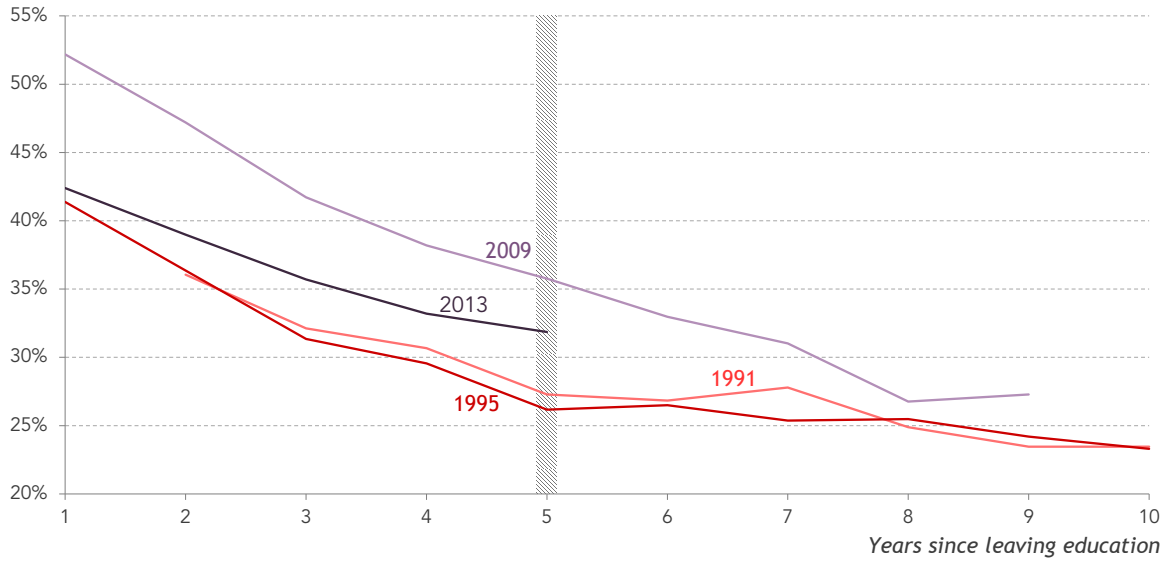
Recessions have a big impact on both employment and wages. However, we have tended to analyse the latter without taking into account the types of jobs people end up doing. What

[11] S Clarke & P Gregg, *Count the pennies: Explaining a decade of lost pay growth*, Resolution Foundation, October 2018

is becoming evident is that young people's pay (both starting salaries and subsequent earnings growth) has been so poor because of the types of jobs they have increasingly found themselves in. Figure 7 compares the proportion of people in a low-paying occupation for the two pairs of cohorts we focused on above. Five years after leaving education, the 1991 cohort had about the same chance of being in a low-paying occupation as the 1995 cohort. By contrast, the cohort that graduated in the midst of the current recession had a low-paying occupation rate 4 percentage points higher than the cohort that left education in 2013.

Figure 7: Recessions lead to a higher proportion of people in lower-paying occupations

Share of people employed in lower-paying occupations, by year left education: UK



Source: RF analysis of ONS, Quarterly Labour Force Survey

Figure 7 also shows that the proportion of younger people working in a relatively low-paying occupation has been rising over time. This is particularly striking given that, across the economy, the share of people in low-paying occupations has remained broadly flat since the early 1990s. This reflects the fact that certain structural changes to the labour market in terms of occupations and sectors (many of which predated the crisis, although were exacerbated by it) have often worked against young people.

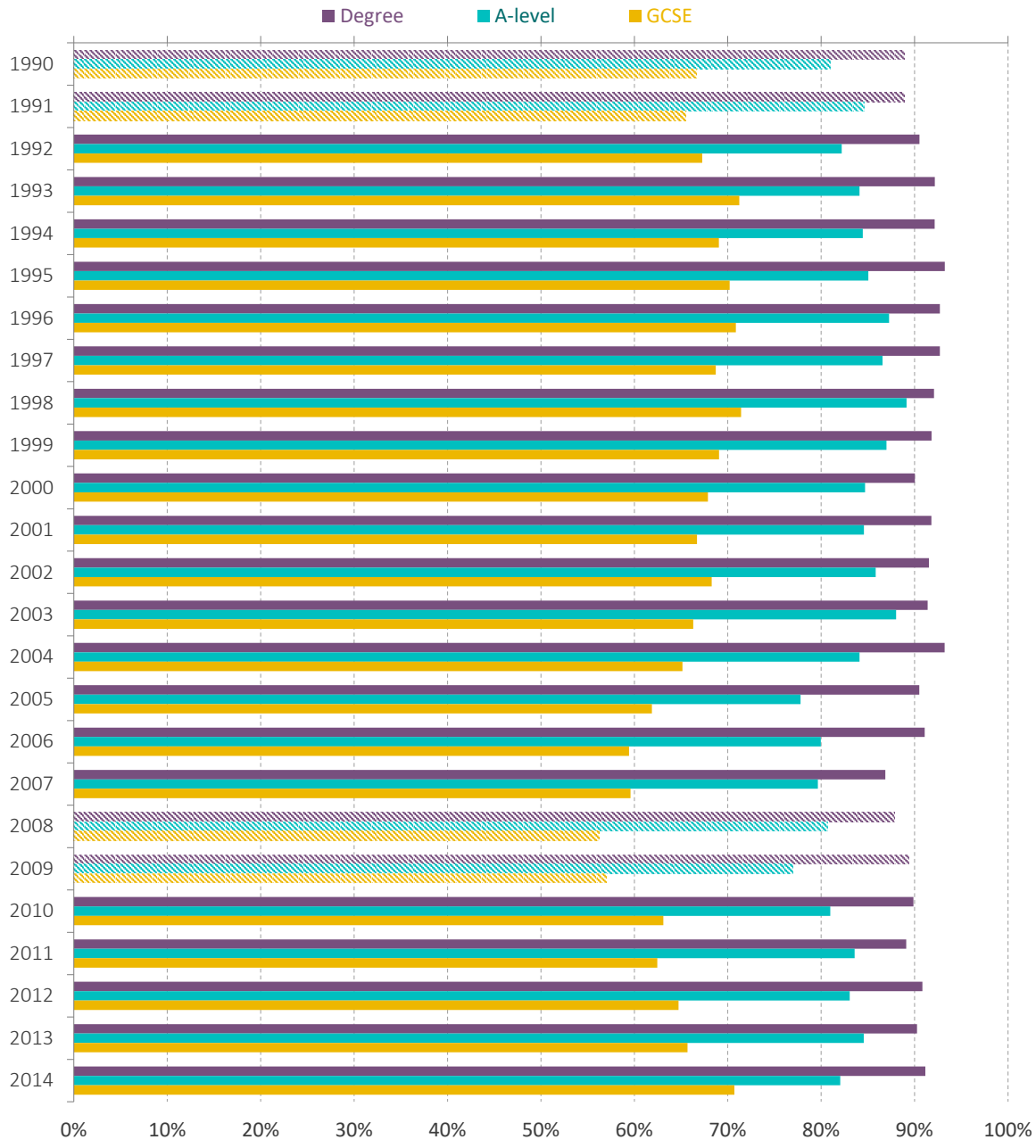
Different groups are affected in different ways

Recessions affect people in different ways. Although a poor economy increases the probability that anyone will be out of work, some people are more susceptible to unemployment than others. We would expect that the employment rates of lower-qualified people would be more sensitive to changes in the macroeconomy. Figure 8 suggests that this is the case. Between 2002 and 2008 the employment rate, four years after leaving education, for those educated only to GCSE level fell by 12 percentage

points, from 68.3 per cent to 56.3 per cent. Over the same period, the employment rate for graduates fell by 3.7 percentage points, from 91.5 per cent to 87.8 per cent.

Figure 8: Less-qualified people are more likely to find themselves out of work after a recession

Employment rate four years after leaving education, by year left education and highest qualification: UK

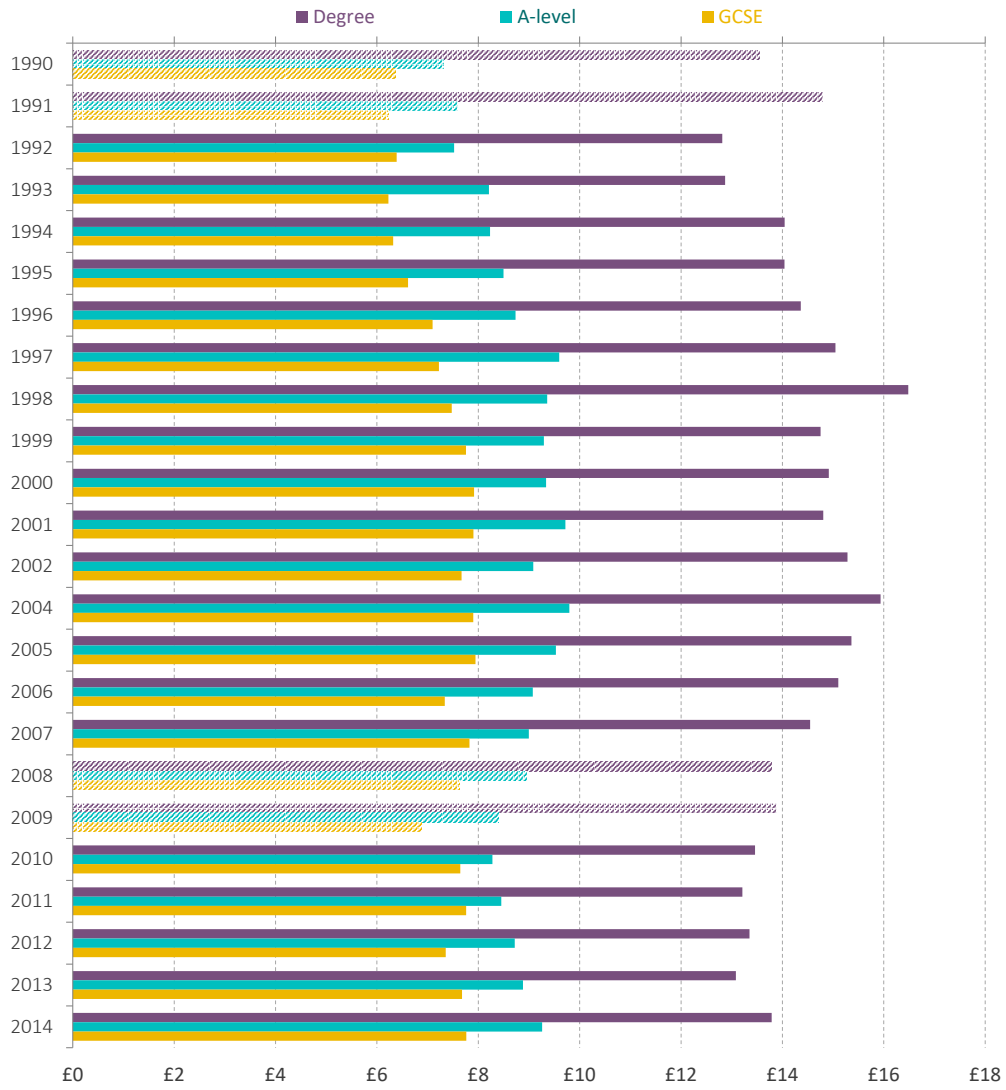


Notes: Recession years are indicated by hatched bars.
Source: RF analysis of ONS, *Quarterly Labour Force Survey*

By contrast, we may expect the wage penalty associated with leaving education during, or soon after, a recession to be higher for more qualified people. Figure 9 shows the average hourly wage for each cohort four years after leaving education. The real hourly earnings of graduates fell 10 per cent, from £15.30 to £13.80, between 2002 and 2008. By contrast the real hourly earnings of people with just GCSE-level qualifications fell just 0.6 per cent (from £7.70 to £7.60).

Figure 9: The wages of higher-qualified people are more affected by downturns

Typical real hourly pay (CPIH-adjusted to 2018 prices) four years after leaving education, by year left education: UK



Notes: Recession years are indicated by hatched bars.
Source: RF analysis of ONS, *Quarterly Labour Force Survey*

This may be due to a combination of factors, including the fact that adjustment for this group happens more through unemployment, that there may be less scope for cutting wages in lower-paid occupations, and that in the recent recession the lowest paid were afforded some protection by the minimum wage.

There is debate as to whether or not more- or less-educated people experience bigger pay penalties during downturns. Some studies find that the impact on graduates is greater,[12] yet others the opposite. For example, Schwandt and Wachter find that those with less than 12 years of schooling experience the biggest earnings penalty, and Cribb, Hood and Joyce find that the earnings of those with low- or mid-levels of education fall the most.[13] This could be because the first paper analyses the US, where the minimum wage is less generous, while the latter paper takes the whole period from 1978 to 2015-16, during the majority of which there was no minimum wage in the UK. This is something we probe in more detail below.

At the start of this paper we made it clear that our objective was to extend the analysis of what happens to young people who leave education in the midst of a downturn to the recent recession. What is starting to become clear is that like in previous recessions the cohort that graduated in the aftermath of the financial crisis suffered higher unemployment and poorer job prospects than their slightly younger counterparts. Unlike other recessions, or at least the early 1990s downturn however, the financial crisis bought with it nominal pay cuts for those starting work in 2008 and 2009, particularly sluggish wage growth and a marked rise in the share of people in low-paying occupations – something not seen in the 1990s. Fortunately, the employment effect was smaller than following the 1990s recession, and has now faded. Less fortunately, the impact on pay and quality of work has persisted. We now turn to more formal analysis of this.

The last two recessions harmed young people's prospects, and the effects took many years to unwind

On the face of it, both the 1990s recession and the recent downturn had a big impact on those unfortunate enough to enter the labour market in the eye of the storm. To test this more formally we build an econometric model and test it on repeated cross-sections of pooled microdata from the quarterly Labour Force Survey (LFS) from 1992 to 2018. This timeframe allows us to estimate how the last two recessions have affected people entering the labour market in and around the downturns. In the final section we try to understand the extent to which the impact of the two most recent downturns differs.

In keeping with past approaches, our model estimates the relationship between the unemployment rate (a proxy for prevailing economic conditions) at the time an individual entered the labour market and subsequent labour market outcomes such as pay, employment and the type of job. Because the precise impact is likely to vary depending on exactly when someone enters the labour market, how much experience they have at

[12] B Cockx, '*Do youths graduating in a recession incur permanent losses?*', *IZA World of Labor 2016: 281*, August 2016
[13] H Schwandt & T von Wachter, '*Unlucky Cohorts: Estimating the Long-term Effects of Entering the Labor Market in a Recession in Large Cross-sectional Data Sets*', NBER Working Paper No. 25141, October 2018; J Cribb, A Hood & R Joyce, *Does leaving education in a recession have a lasting impact on living standards?*, Institute for Fiscal Studies, November 2017

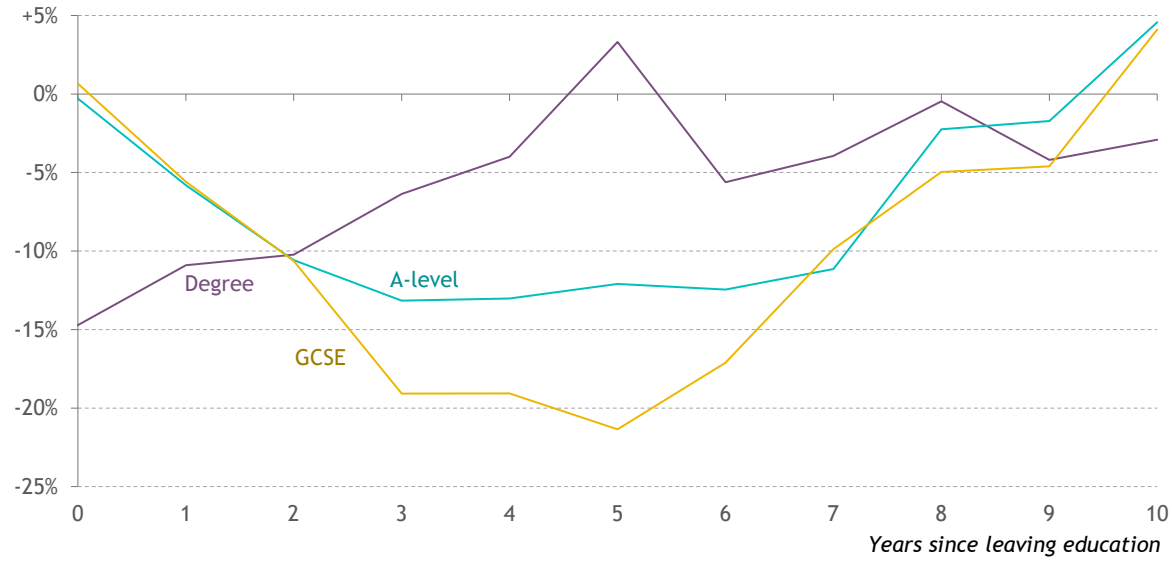
the time, and how qualified they are, we take these things into account. This also means that we take into account changes in the composition of successive cohorts entering the labour market. In essence we are comparing outcomes for people who entered the labour market a small number of years apart, controlling for differences between these individuals.

Using this approach we can estimate how the effect of leaving education and entering work when the economy is weak varies with the number of years since the individual left education, asking to what extent the effect fades over time? We also run a series of models where, instead of capturing economic conditions at the time of initial labour market entry via the unemployment rate, we use the output gap, measured as a percentage of potential GDP. This is important as the rise in unemployment was smaller in the recent recession but the fall in GDP was greater.

We adopt a similar approach to other studies.[14] The main ways we advance these are by using data up to the end of 2018, and by focusing on a broader range of labour market outcomes for people with different qualifications in order to unpick the mechanisms by which the effects we observe occur. Full details of our approach and a full breakdown of our results can be found in the Annex.

Figure 10: High unemployment when leaving education reduces the probability that an individual will find work

Change in chance of being employed for a 3 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 1992-2018



Source: RF modelling using ONS, *Quarterly Labour Force Survey*

Starting with the impact on employment, Figure 10 shows the change in the likelihood of being in work for a 3 percentage point increase in the unemployment rate the year after someone leaves education. We have chosen a 3 percentage point increase as this

[14] See footnotes 3 and 4.

was the average increase in the unemployment rate following the 1990-91 and 2008-09 recessions. We use the unemployment rate in the year after someone leaves education as we do not know the month someone left education and so using the following year means we can be certain this is the unemployment rate that would have confronted people. Using data on the time when people left education is a big advantage over some previous studies, which relied on estimating the time when people left education based on their age and qualifications.[15]

Figure 10 shows that people – particularly those with lower levels of education - are more likely to find themselves out of work if they enter the labour market in the midst of a downturn. High unemployment at the time of leaving education has a far more pronounced effect on non-graduates. Although the probability that graduates will be in work does fall, at least initially, this effect is statistically insignificant. By contrast, the probability that someone educated to only A-level-equivalent is in employment five years after leaving education falls by 12 per cent, and by 21 per cent for those educated to only GCSE level. It is interesting that there is a delay in these effects, with the largest impact occurring three to seven years after leaving education. This is likely to be because this analysis includes the run-up to and aftermath of the financial crisis, but just the aftermath of the early-1990s recession. If we just analyse the latter period, a far more immediate fall in employment for lower-qualified people is observed (see Figure 18 in Annex). We find similar results using the output gap instead of the unemployment rate.

To put these effects in context, between 1990 and 1993 the employment rate for 18 to 29 year olds fell by 9 per cent. Figure 10 suggests that the effect of downturns upon the employment prospects of the lower-qualified who have just left education is larger, and takes a very long time to unwind.

Turning to the impact on pay, Figure 11 shows that people leaving education when unemployment is elevated experience an initial pay penalty of up to 9 per cent. This persists: for around four years for those educated to GCSE-level, and for five years for those with a degree. The fact that those with only GCSE-level qualifications initially fare worse seems to contradict Figure 9, however it is similar to what is found in other papers, as discussed above. Furthermore, comparing downturns there is evidence that the pay of graduates (compared to that of lower-educated people) fared worse in the recent downturn, whereas the converse is the case in the aftermath of the 1990-91 recession. This perhaps reflects the fact that minimum (and living) wages afforded some protection in the recent downturn. We show this in more detail in Figure 17 below.

Again, we run the same model though this time using the output gap instead of the unemployment rate. The effects are similar though slightly smaller in magnitude. Joining the labour market during a booming economy boosts pay, joining when there is a negative output gap depresses pay.

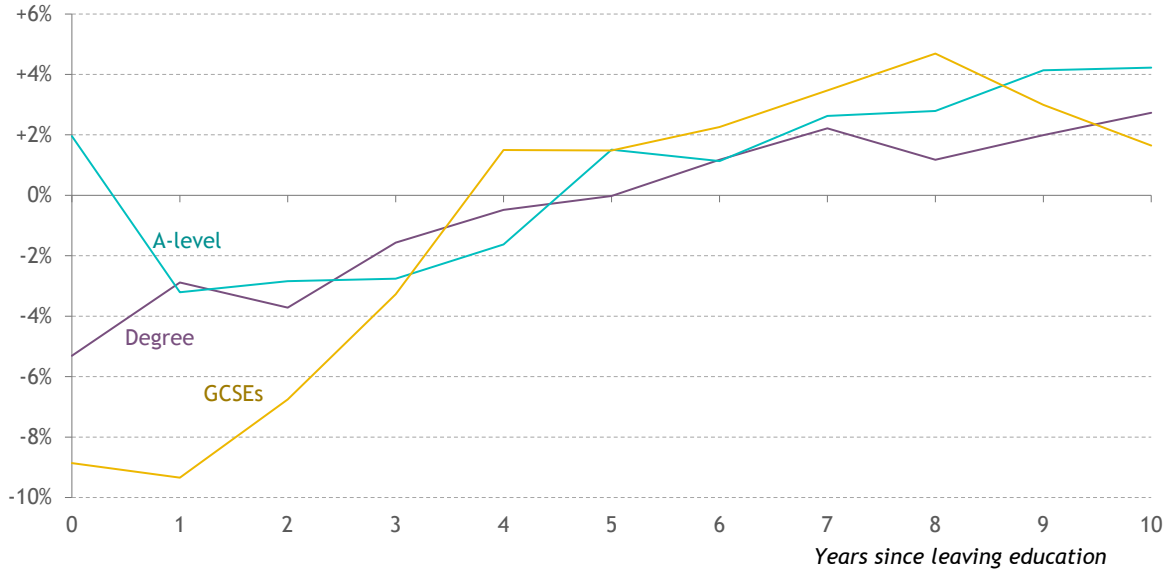
How large are these effects? To put them in context, it is helpful to compare them to the average annual increase in cohort starting salaries. Between 1993 and 2005, the real hourly earnings for a cohort two years after leaving education (the purple dots in Figure

[15] H Schwandt & T von Wachter, '*Unlucky Cohorts: Estimating the Long-term Effects of Entering the Labor Market in a Recession in Large Cross-sectional Data Sets*', NBER Working Paper No. 25141, October 2018

6) increased by an average of 3 per cent per year. By contrast those entering the labour market after a spike in unemployment can expect their earnings to be up to 9 per cent lower and remain lower half decade later. This is a big effect, and of similar magnitude to other studies.

Figure 11: Higher unemployment rates when people enter the labour market are associated with lower rates of pay

Change in average hourly pay for a 3 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 1992-2018



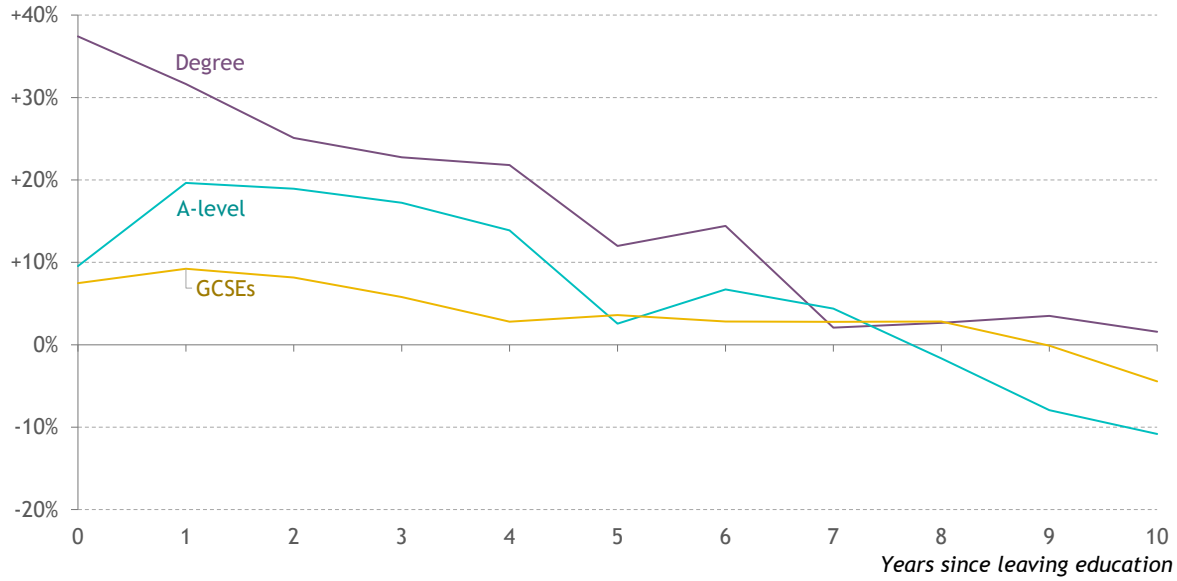
Source: RF modelling using ONS, *Quarterly Labour Force Survey*

While people with lower qualifications find themselves out of work in the midst of a downturn, higher-educated workers accept worse jobs than they would perhaps have accepted in a more buoyant economy. Indeed – as we shall analyse in more detail below – this is one of the main ways that pay is reduced for those leaving education in the midst of a recession.

Figure 12 shows that the probability of being in a lower-paid occupation increases the most for graduates. Up to one year after leaving education, graduates who enter a depressed labour market are 30 per cent more likely to be in a low-paying occupation and remain much more likely to be in such a job almost a decade after graduating. This is likely to have a big impact on their future prospects because there is evidence that time spent in a low-paying occupation has a long-lasting impact on someone's future earnings trajectory.

Figure 12: Leaving education when unemployment is elevated increases the chance that someone will end up working in a low-paid occupation

Change in chance of being in a low-paid occupation for a 3 percentage point increase in the unemployment rate in year after leaving education: UK, 1992-2018



Notes: Occupations are categorised based on average hourly earnings. The high-paying occupations are managers, professionals, associate professionals and technical occupations. The low-paying occupations are elementary occupations, sales and customer service occupations and caring, leisure and other service occupations.
Source: RF modelling using *ONS, Quarterly Labour Force Survey*

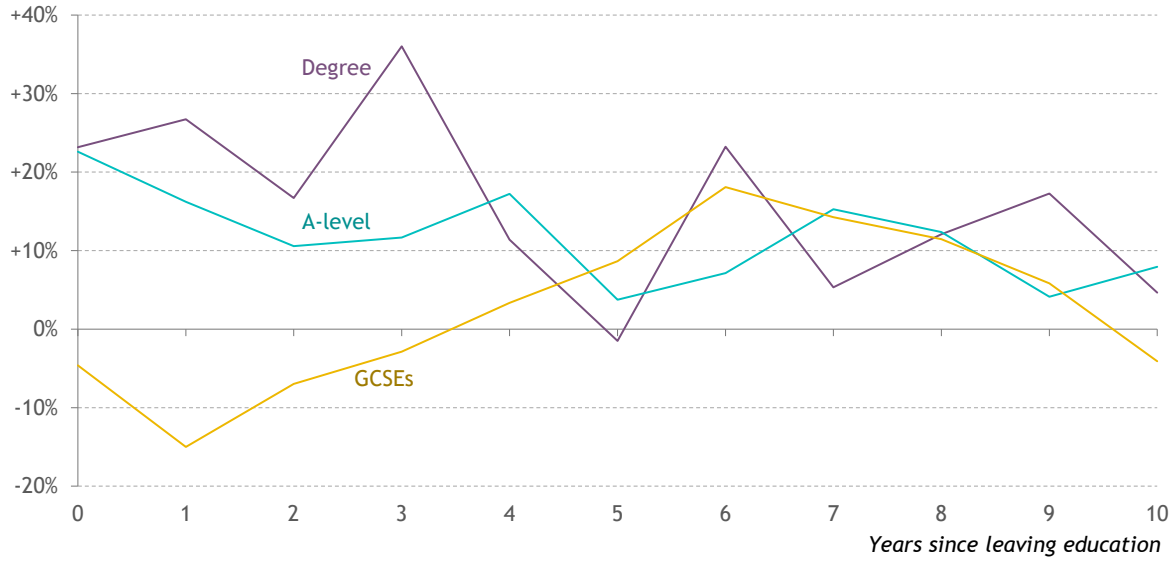
Similarly, the chances that a graduate will end up working part time involuntarily are much higher if they leave education in the midst of a recession.[16] By contrast recessions, have a lot less of an impact on the probability that non-graduates will end up in these roles. A high proportion of them will be in these roles regardless of the cycle, for instance 56 per cent of the 2004 cohort educated up to GCSE level were in a lower-paid role two years after leaving education.

Figure 13 shows that graduates who leave education when unemployment is elevated are between 20 and 40 per cent more likely to end up working part time involuntarily in the first three years after leaving education than graduates who leave education in better economic conditions. The effect for people with just A-level qualifications is less pronounced and there is no impact on those with just GCSE-level qualifications. This suggests that adjustment for these groups occurs more in terms of whether or not they end up in work, rather than the type of job they end up doing.

[16] We define 'involuntary' part-time working as someone who is working part time but wants to work full time.

Figure 13: Graduates who leave education during a recession are a lot more likely to end up working part time involuntarily

Change in chance of working part time involuntarily for a 3 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 1992-2018



Source: RF modelling using ONS, Quarterly Labour Force Survey

The types of jobs people enter after leaving education have lasting effects

The earnings of those who leave education in the midst of a downturn may be depressed because of the initial choices they (have to) make. For instance, with fewer higher-paying roles available, working in a lower-paying one clearly incurs a pay penalty. It is possible that these effects unwind once the economy improves and people move into the higher-paying occupations they might otherwise have entered.

There is evidence to suggest that this is not the case. Time spent in lower-paying occupations, or in part-time roles, is, in terms of someone's earnings prospects, less valuable. This is because wage progression is lower in these roles and so returns to tenure are worse. There is also evidence that moves from lower- to higher-paying roles are relatively uncommon and that even if someone moves into a higher-paying role they do not make up the lost ground.

Figure 14 shows the typical (median) change in hourly pay over the course of a year for 18 to 25 year olds, for different occupation groups and tenure lengths. It shows that the typical hourly pay rise over a year for someone in a high-paying occupation who had been employed for between one and two years was 54p, far higher than the typical pay rise for someone working in a low-paying occupation, where the increase was 32p. Returns to tenure rise pretty steadily in high-paying occupations whereas the returns to tenure appear to drop after three to four years in lower-paying occupations.

Figure 14: People in lower-paying occupations experience lower returns to tenure than those in higher-paying ones

Median change in nominal hourly pay over the course of a year for 18-25 year olds, by occupation, hours and tenure length: UK, 2008-18

Notes: Occupations are categorised based on average hourly earnings. The high-paying occupations are managers, professionals, associate professionals and technical occupations. The low-paying occupations are elementary occupations, sales and customer service occupations and caring, leisure and other service occupations.
Source: RF analysis using ONS, *Five-Quarter Longitudinal Labour Force Survey*

Figure 14 also shows the returns to tenure for full-time and part-time employees. Typical pay rises are higher for full-time staff and pay rises quickly decline after two years for part-time staff. This demonstrates the impact that starting one's career in a low-paying occupation can have. Not only is pay lower, but pay progression is also slower.

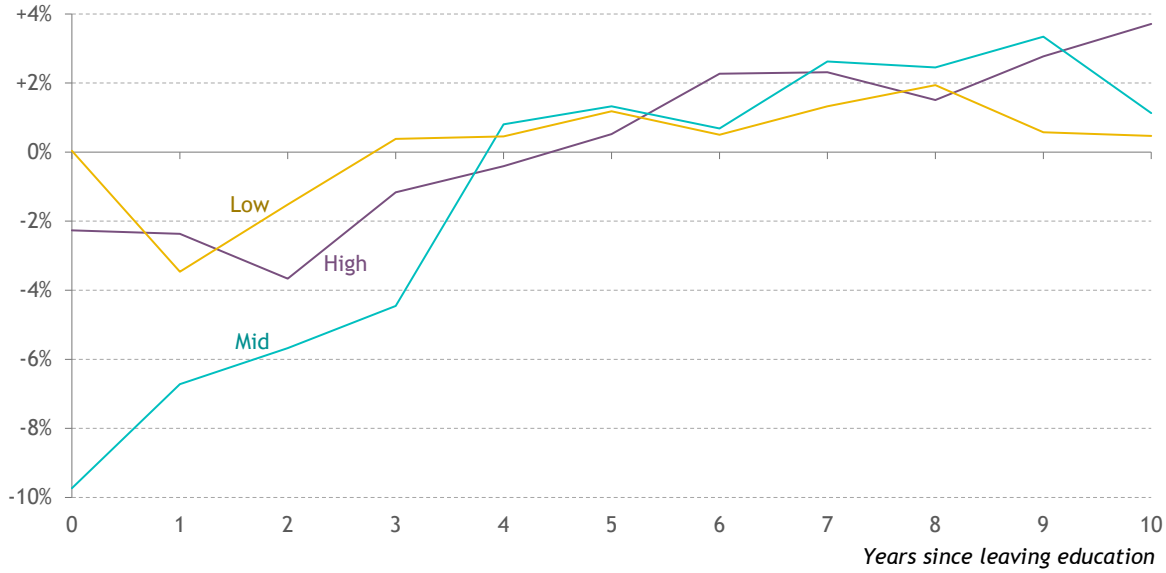
Furthermore, there is evidence that it is hard to move from a lower-paying occupation to a higher-paying one. Between 2008 and 2018, only 4 per cent of job-to-job moves by 18 to 25 year olds were from one of the three lower-paying occupations to one of the three higher-paying occupations, compared to 21 per cent which were between higher-paying occupations. The typical hourly wage, after moving, for someone moving from a lower-paying to a higher-paying occupation was £7.40, whereas it was £10 for someone moving between higher-paying occupations. This adds weight to the argument that someone who moves into a higher-paying role (from a lower-paying one) does not tend to make up the lost ground, perhaps because they have not gained so much relevant experience working in the lower-paying role.

This begs the question of the extent to which the poor earnings experience of young people in the recent downturn is due to having to work in lower-paying occupations than they might otherwise have, as opposed to wage restraint occurring across all occupations, even the higher-paid ones.

Figure 15 tests this by examining the pay effects across the three different occupational groups. It shows that hourly pay falls most for those in mid-paid occupations, while the impacts on low- and high-paid occupations are relatively small. In the case of low-pay occupations, and as noted above, limited scope to reduce pay near the bottom of the distribution and the backstop effect of minimum and living wages in the more recent downturn may be mitigating against pay reductions.

Figure 15: Those in mid-paid occupations experience the largest reduction in pay

Change in average hourly pay for a 3 percentage point increase in the unemployment rate in year after leaving education, by occupational pay status: UK, 1992-2018



Notes: Occupations are categorised based on average hourly earnings. The high-paying occupations are managers, professionals, associate professionals and technical occupations. The mid-paying occupations are administrative and secretarial occupations, skilled trade occupations and process, plant and machine operatives. The low-paying occupations are elementary occupations, sales and customer service occupations and caring, leisure and other service occupations.
Source: RF modelling using ONS, *Quarterly Labour Force Survey*

These findings lend weight to the conclusion that wage adjustment happens through people either moving into lower-paying roles than they would have expected to go into (particularly if they have higher levels of education), or by reductions in pay for people in mid-paid roles. It also suggests that people fortunate enough to end up in a higher-paying role may escaped the worst of the impact.

The recent recession may have had a more lasting impact on the prospects of younger workers, particularly graduates

In the early-1990s recession, hourly earnings for those aged 18 to 29 fell by 2 per cent peak-to-trough. In the recent downturn, this group's wages fell by 9 per cent. On the face of it, then, it appears that the recent downturn has had a larger effect on the earnings prospects of younger people. But what about the impact on those who left education in

the midst of financial crisis versus those who entered work during the 1990s recession? It could be that although the recent downturn was – in general – a lot worse for people's (particularly younger people's) earnings, there may not be much of a difference in the impact on those who entered work in the midst of the crisis versus those who started work in the run-up to it or after the economy started to improve.

To try and isolate the specific impact of leaving education in the midst of the crisis we can run separate models for two time periods. The first covers the aftermath of the early-1990s recession up to the financial crisis, while the second covers the period from 2000 to 2018. We chose these periods because the quarterly LFS only begins in 1992, and we are unable to capture the run-up to the early-1990s recession. We choose 2000 as the start date for the second period because this is the point at which the unemployment rate returns to the level it was at before the 1990s recession.

Figure 16: The effects of the recent recession on pay appear to have lasted longer

Change in average hourly pay for a 3 percentage point increase in the unemployment rate in year after leaving education: UK 1992-2006 and 2000-2018

Source: RF modelling using ONS, Quarterly Labour Force Survey

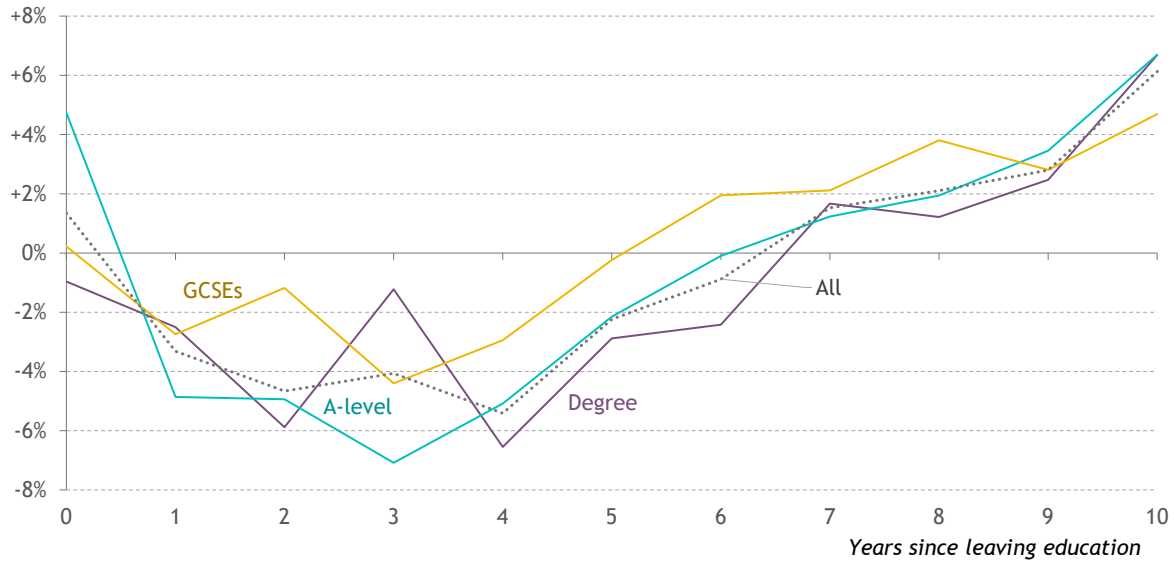
Figure 16 shows the result of the model run over the two time periods. Despite the initial reduction in pay being smaller in 2000 to 2018, the impact lasts 50 per cent longer. A 3 percentage point increase in unemployment is associated with a fall of 4 per cent in hourly pay one year after leaving education and pay remains noticeably lower six years later, compared to 4 years in the wake of the 1990-91 downturn. It's interesting that in the first period the rise in unemployment is initially associated with a larger fall in pay, but as mentioned above, this effect dissipates faster, likely to be because of the strong pay growth experienced by those just out of education between 1995 and 1999 (see Figure 2).

Some of this is consistent with what we know about the recent recession; the pay squeeze endured for far longer than in the 1990s. Figure 6 shows that pay growth was subdued for cohorts leaving education from 2004 onwards. Similarly the recovery from the recent downturn – at least in terms of pay – has been far more sluggish. Starting salaries for those leaving education rose by an average of 4 per cent per annum between 1993 and 1999, they grew by just 1 per cent per annum between 2012 and 2016. Those cohorts who entered the labour market after the early-1990s recession benefitted from more of an uptick in pay than those who have entered the labour market since the recent recession.

Furthermore, as mentioned above, the impact on graduates was more marked in the recent downturn. This is shown in Figure 17. Two years after leaving education pay is depressed by between 5 and 6 per cent for people educated to A-level, or who have a degree, whereas the pay penalty for people with just GCSE's is an insignificant 1 per cent. Furthermore the impact endures for longer for those with A-levels and the longest for people who have been to university. Again this speaks to the different nature of the recent downturn compared to the 1990-91 recession.

Figure 17: Higher-educated people experienced a more enduring pay penalty in the recent downturn

Change in average hourly pay for a 3 percentage point increase in the unemployment rate in year after leaving education: UK 2000-2018



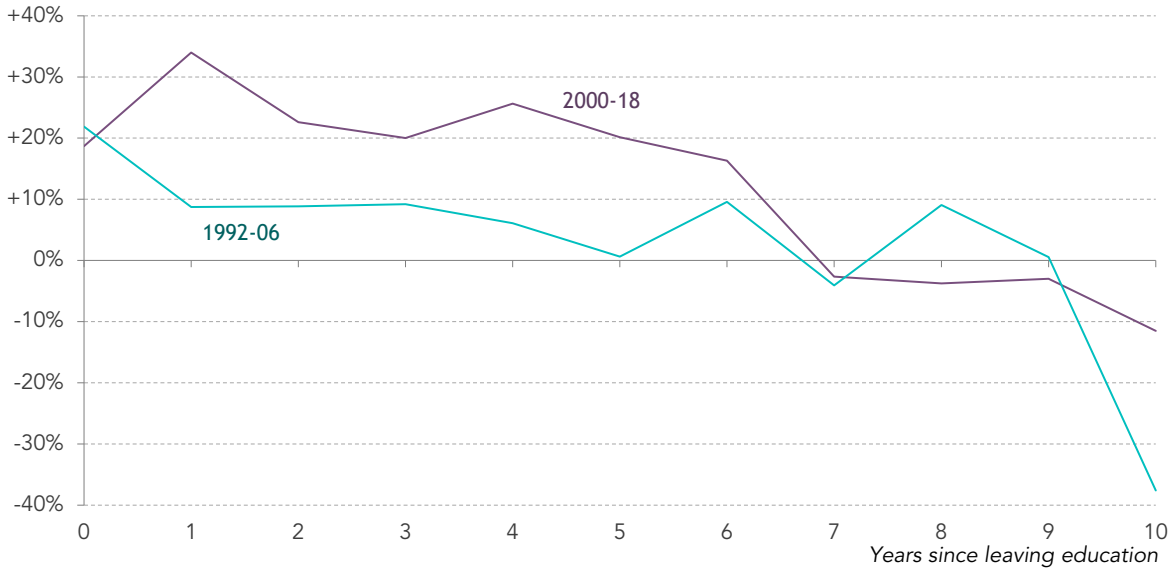
Source: RF modelling using ONS, Quarterly Labour Force Survey

Having identified that one of the main ways that people (particularly those with higher levels of education) suffer a pay penalty when leaving education during a downturn is through working in a lower-paid occupation than they would have in better economic times, we can compare the impact of the two downturns on the types of jobs people are doing. Figure 17 shows the change in the probability of graduates being in a low-paid occupation for the two time periods. One year after leaving education, a graduate who entered the labour market at a time of high unemployment between 2000 and 2018 was

34 per cent more likely to be in a low-paying occupation. By contrast the figure for the 1992 to 2006 period was 9 per cent. The recent downturn appears to have had a more pronounced impact on the chances of a graduate working in a low-paying occupation.

Figure 18: The recent downturn had a far more pronounced impact on the probability of a graduate working in a low-paying occupation

Change in chance of a graduate being in a low-paid occupation for a 3 percentage point increase in the unemployment rate in year after leaving education: UK 1992-2006 and 2000-2018



Source: RF modelling using ONS, Quarterly Labour Force Survey

Conclusion

This analysis extends what we know about recessions, telling us something new about how their effects on pay occur, and telling us something new about the recent downturn. In line with previous studies, we have found that recessions have lasting effects on those unfortunate enough to enter the labour market in their midst or in their immediate aftermath. The recent recession was no exception (although the impact on employment was more muted) and yet it has also thrown up some new challenges. Our occupation analysis suggests that wage falls are mostly transmitted through people taking up lower-paid occupations, and pay being squeezed in mid-paid occupations, rather than pay being squeezed in higher- and lower-paid occupations. Interestingly we find that, although there is no clear evidence that the recent downturn had a larger initial impact on young people entering the labour market in its midst, there is some evidence it persisted for longer. Furthermore the recent downturn led to a far more pronounced rise in the share of people in lower-paying occupations. Graduates in particular were a lot more likely to be in low-paid or involuntary part-time work and to remain in such roles many years after leaving education. This is something we did not encounter in the aftermath of the 1990s downturn.

It is too soon to know what the full, long-term, impact of the recent recession on those who graduated in its midst will be. As mentioned at the beginning of this paper, the impact of a period of unemployment on people's future prospects may still be observed over 10 years later. The econometric analysis suggests that, on average, cohorts who entered the labour market during downturns had seen their wages catch up after around six years. More specifically, though, the wages and job prospects of the 2009 cohort, who left education in midst of the recent recession, may not yet have recovered. Compared to average earnings they are still earning less nine years after entering the labour market than those who left education in 1991.

Determining exactly how long the impact of the recent recession persists on those most affected is important, but more important is establishing that these effects last a long time. For policy makers this means that, accepting that recessions do occur, mitigating their worst effects should be a priority. The recent downturn affected fewer young people in terms of unemployment than previous ones, and although this was more due to the nature of the adjustment process than to any specific action by government, one could argue that steps taken to reform the UK labour market in the 1990s and 2000s helped.

Therefore today we should be taking steps to prepare for future recessions. This does not mean losing sight of the fact that next time the adjustment mechanism (depreciation driving a price spike which meant that real wages could fall) may be different and unemployment may rise more, but we should also be worried about young people being stuck in low-paid jobs and what this does to their future earnings prospects. This is particularly the case given that we have shown that time spent in lower-paying occupations results in slower earnings progression, and that the effects do not unwind immediately if someone moves to a higher-paying role. This means that if we're concerned about the plight of those whose careers have been marred by the last downturn then we cannot just focus on extensive employment margins. Active labour market policy needs to do more to support those who, despite remaining in work, have had their earnings trajectories and job prospects severely affected.

Annex

Estimation approach

To estimate the relationship between an individual's hourly pay, the time they entered the labour market, and the amount of experience they have, we estimate the following equation:

We regress the natural logarithm of pay for each individual (i) across each cohort (c) at time (t) against a constant, an interaction of the years of experience (0 to 10) with highest qualification held (degree, A-level, or GCSEs), an interaction of the years of experience with the unemployment rate in the year after they left education, year dummies and a dummy for male or female. We also include a set of three-year cohort dummy variables based on when an individual left education (e.g. a dummy for 1990 to 1992, 1993 to 1995, etc.). These control for any fixed unobservable differences between cohorts and mean that we are comparing sets of cohorts that left education relatively close (three years) to each other.

The coefficients of interest are the sum of the unemployment term and each of the experience interaction terms. In this way we can estimate how the effects change over time as people become more experienced. In this model we control for a full set of interactions between qualifications and experience.

We also run separate models for each qualification group using the following equation:

This is the same as the model above but without the full set of interactions between qualifications and experience because we run the model three times, once for each qualification group, while controlling for experience a well as including it as a multiplicative term with unemployment. In both models we cluster standard errors by the year people left education.

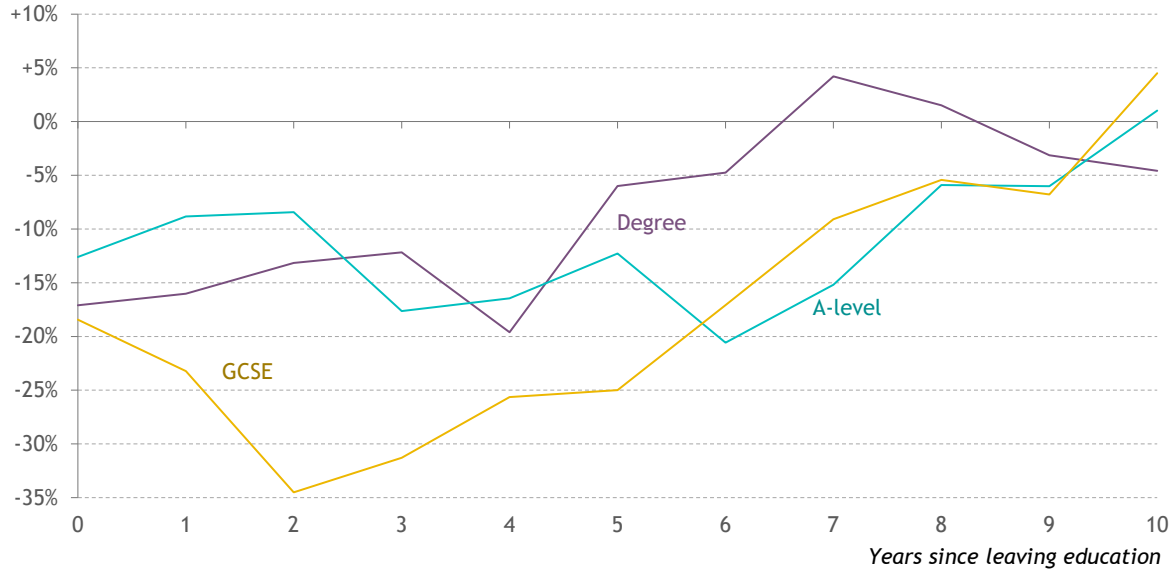
We also run the same model but instead of pay being the dependent variable we use employment, whether or not someone is in a low-paying job, and whether or not someone is working part time but wants to work full time. In these cases we estimate a logit model and calculate odds ratios.

We also run both equations above substituting the output gap (as estimated by the OECD) as a percentage of potential GDP for the unemployment rate. Finally, we run the model on two overlapping time periods: 1992–2006 and 2000-18. When we do this we do not include the set of three-year dummy variables because we are already comparing cohorts that left education relatively close to each other.

Results

Figure 19: The impact on employment for those with just GCSE-level qualifications was far more immediate in the recent downturn

Change in chance of being employed for a 3 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 2000-18



Source: RF modelling using ONS, Quarterly Labour Force Survey

Table 1: A rise in the unemployment rate is associated with a fall in hourly pay

Percentage change in average hourly pay for a 1 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held and time period: UK, 1992-2018

Effect by years since leaving education		Dep var: log hourly pay					
		All	Degree	A-level	GCSE	All (1992-2006)	All (2000-2018)
0	Coefficient	-0.01	-0.02	0.01	-0.03	-0.03	0.00
	T-Stat	-1.23	-1.31	0.64	-1.49	-2.91	0.48
1	Coefficient	-0.02	-0.01	-0.01	-0.03	-0.02	-0.01
	T-Stat	-2.37	-1.14	-1.52	-2.26	-4.13	-2.29
2	Coefficient	-0.02	-0.01	-0.01	-0.02	-0.02	-0.02
	T-Stat	-2.18	-1.85	-2.27	-1.73	-3.30	-3.71
3	Coefficient	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
	T-Stat	-1.19	-0.79	-2.30	-0.96	-2.72	-3.16
4	Coefficient	0.00	0.00	-0.01	0.01	0.00	-0.02
	T-Stat	0.18	-0.31	-1.00	0.67	-0.60	-3.36
5	Coefficient	0.00	0.00	0.01	0.00	0.00	-0.01
	T-Stat	0.86	-0.02	1.24	0.66	-0.25	-1.15
6	Coefficient	0.01	0.00	0.00	0.01	0.00	0.00
	T-Stat	1.31	0.84	0.89	1.11	-0.96	-0.40
7	Coefficient	0.01	0.01	0.01	0.01	0.00	0.01
	T-Stat	2.19	1.56	1.84	1.74	-0.03	0.71
8	Coefficient	0.01	0.00	0.01	0.02	0.00	0.01
	T-Stat	2.36	0.85	1.89	3.21	-0.27	1.13
9	Coefficient	0.01	0.01	0.01	0.01	0.00	0.01
	T-Stat	2.14	1.39	2.95	2.00	0.29	1.79
10	Coefficient	0.01	0.01	0.01	0.01	0.02	0.02
	T-Stat	1.96	2.02	3.17	0.97	2.00	7.24
Observations		343,672	135,964	112,141	95,567	125,990	303,513

Notes: Critical values for T-statistics are: 1.645 (10%), 1.96 (5%), 2.576 (1%).
Source: RF modelling using ONS, *Quarterly Labour Force Survey*

Table 2: Those in mid-paid occupations experience a bigger pay penalty in the aftermath of a recession

Percentage change in average hourly pay for a 1 percentage point increase in the unemployment rate in year after leaving education, by occupational pay status: UK, 1992-2018

Effect by years since leaving education		Dep var: log hourly pay		
		High	Mid	Low
0	Coefficient	-0.01	-0.03	0.00
	T-Stat	-0.56	-1.97	0.02
1	Coefficient	-0.01	-0.02	-0.01
	T-Stat	-0.92	-2.13	-3.09
2	Coefficient	-0.01	-0.02	-0.01
	T-Stat	-1.86	-1.88	-1.52
3	Coefficient	0.00	-0.01	0.00
	T-Stat	-0.60	-1.82	0.27
4	Coefficient	0.00	0.00	0.00
	T-Stat	-0.27	0.50	0.40
5	Coefficient	0.00	0.00	0.00
	T-Stat	0.33	0.91	1.62
6	Coefficient	0.01	0.00	0.00
	T-Stat	1.60	0.57	0.46
7	Coefficient	0.01	0.01	0.00
	T-Stat	1.45	2.29	1.24
8	Coefficient	0.01	0.01	0.01
	T-Stat	1.09	2.24	2.15
9	Coefficient	0.01	0.01	0.00
	T-Stat	1.68	3.63	0.61
10	Coefficient	0.01	0.00	0.00
	T-Stat	2.35	1.32	0.84
Observations		157,377	90,470	95,825

Notes: Critical values for T-statistics are: 1.645 (10%), 1.96 (5%), 2.576 (1%).
Source: RF modelling using ONS, *Quarterly Labour Force Survey*

Table 3: A rise in the unemployment rate is associated with a fall in the likelihood of being employed

Percentage change in the likelihood of being employed for a 1 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 1992-2018

Effect by years since leaving education		Dep var: Employment			
		All	Degree	A-level	GCSE
0	Coefficient	-0.01	-0.05	0.00	0.00
	T-Stat	-0.65	-2.52	-0.06	0.08
1	Coefficient	-0.02	-0.04	-0.02	-0.02
	T-Stat	-1.50	-2.21	-1.44	-0.85
2	Coefficient	-0.03	-0.03	-0.04	-0.04
	T-Stat	-2.53	-2.28	-2.67	-1.71
3	Coefficient	-0.05	-0.02	-0.04	-0.07
	T-Stat	-4.37	-1.12	-3.87	-3.41
4	Coefficient	-0.05	-0.01	-0.04	-0.07
	T-Stat	-5.04	-0.85	-2.71	-4.43
5	Coefficient	-0.05	0.01	-0.04	-0.07
	T-Stat	-5.43	0.64	-3.33	-5.35
6	Coefficient	-0.04	-0.02	-0.04	-0.06
	T-Stat	-6.25	-1.11	-3.27	-6.02
7	Coefficient	-0.03	-0.01	-0.04	-0.03
	T-Stat	-3.85	-0.74	-2.80	-3.39
8	Coefficient	-0.01	0.00	-0.01	-0.02
	T-Stat	-1.21	-0.11	-0.57	-1.58
9	Coefficient	-0.01	-0.01	-0.01	-0.02
	T-Stat	-1.68	-0.99	-0.39	-1.58
10	Coefficient	0.01	-0.01	0.02	0.01
	T-Stat	1.22	-1.25	2.03	1.49
Observations		1,773,985	585,188	556,867	631,930

Notes: Critical values for T-statistics are: 1.645 (10%), 1.96 (5%), 2.576 (1%).
Source: RF modelling using ONS, Quarterly Labour Force Survey

Table 4: A rise in the unemployment rate is associated with a rise in the likelihood of working part time involuntarily

Percentage change in chance of working part time involuntarily for a 1 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held: UK, 1992-2018

Effect by years since leaving education		Dep var: Involuntary part-time			
		All	Degree	A-level	GCSE
0	Coefficient	0.04	0.07	0.07	-0.02
	T-Stat	2.43	1.99	3.55	-0.51
1	Coefficient	0.02	0.09	0.05	-0.05
	T-Stat	1.19	3.23	2.74	-2.41
2	Coefficient	0.01	0.05	0.03	-0.02
	T-Stat	1.10	2.50	2.04	-1.41
3	Coefficient	0.03	0.11	0.04	-0.01
	T-Stat	2.46	5.84	1.75	-0.57
4	Coefficient	0.03	0.04	0.06	0.01
	T-Stat	2.20	1.11	2.13	0.64
5	Coefficient	0.02	0.00	0.01	0.03
	T-Stat	1.40	-0.15	0.45	1.51
6	Coefficient	0.05	0.07	0.02	0.06
	T-Stat	3.93	1.83	1.10	3.15
7	Coefficient	0.04	0.02	0.05	0.05
	T-Stat	3.06	0.57	1.49	2.28
8	Coefficient	0.04	0.04	0.04	0.04
	T-Stat	2.16	1.70	1.57	1.39
9	Coefficient	0.02	0.06	0.01	0.02
	T-Stat	1.18	1.97	0.36	0.66
10	Coefficient	0.01	0.02	0.03	-0.01
	T-Stat	0.74	0.73	1.62	-0.99
Observations		1,406,828	523,088	466,485	417,255

Notes: Critical values for T-statistics are: 1.645 (10%), 1.96 (5%), 2.576 (1%).
Source: RF modelling using ONS, Quarterly Labour Force Survey

Table 5: A rise in the unemployment rate is associated with a rise in the likelihood of working in a low-paying job

Percentage change in chance of being in a low-paid occupation for a 1 percentage point increase in the unemployment rate in year after leaving education, by highest qualification held and time period: UK, 1992-2018

Effect by years since leaving education		Dep var: In a low-paying occupation					
		All	Degree	A-level	GCSE	Degree (1992-06)	Degree (2000-18)
0	Coefficient	0.05	0.12	0.03	0.02	0.07	0.06
	T-Stat	3.05	4.25	1.59	1.11	1.81	1.48
1	Coefficient	0.06	0.10	0.06	0.03	0.03	0.11
	T-Stat	4.95	5.41	3.45	2.01	0.77	4.97
2	Coefficient	0.05	0.08	0.06	0.03	0.03	0.08
	T-Stat	4.93	5.18	3.79	1.90	0.90	3.88
3	Coefficient	0.05	0.07	0.06	0.02	0.03	0.07
	T-Stat	4.10	4.46	3.63	1.32	1.04	3.84
4	Coefficient	0.04	0.07	0.05	0.01	0.02	0.09
	T-Stat	3.71	4.55	4.10	0.69	0.67	4.91
5	Coefficient	0.02	0.04	0.01	0.01	0.00	0.07
	T-Stat	1.55	1.65	0.74	0.79	0.06	2.08
6	Coefficient	0.02	0.05	0.02	0.01	0.03	0.05
	T-Stat	2.50	3.44	2.27	0.70	1.56	3.38
7	Coefficient	0.01	0.01	0.01	0.01	-0.01	-0.01
	T-Stat	1.29	0.41	1.44	0.67	-0.53	-0.46
8	Coefficient	0.01	0.01	-0.01	0.01	0.03	-0.01
	T-Stat	0.65	0.46	-0.50	0.76	1.33	-0.75
9	Coefficient	-0.01	0.01	-0.03	0.00	0.00	-0.01
	T-Stat	-0.49	0.48	-1.56	-0.03	0.04	-0.38
10	Coefficient	-0.02	0.01	-0.04	-0.01	-0.13	-0.04
	T-Stat	-1.63	0.51	-2.87	-1.22	-4.49	-5.33
Observations		1,389,567	519,257	461,647	408,663	153,911	471,116

Notes: Critical values for T-statistics are: 1.645 (10%), 1.96 (5%), 2.576 (1%). Occupations are categorised based on average hourly earnings. The high-paying occupations are managers, professionals, associate professionals and technical occupations. The low-paying occupations are elementary occupations, sales and customer service occupations and caring, leisure and other service occupations.
Source: RF modelling using ONS, *Quarterly Labour Force Survey*

Resolution Foundation

The Resolution Foundation is an independent research and policy organisation. Our goal is to improve the lives of people with low to middle incomes by delivering change in areas where they are currently disadvantaged. We do this by:

- undertaking research and economic analysis to understand the challenges facing people on a low to middle income;
- developing practical and effective policy proposals; and
- engaging with policy makers and stakeholders to influence decision-making and bring about change.

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