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For some, luck matters more: the impact of the great recession on the early careers of graduates from different socio-economic backgrounds[*]

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Abstract

This article uses variation in unemployment caused by the 2008 UK recession to analyse socio-economic gaps in graduate outcomes. Our data come from a survey that collects information on several cohorts of students from all English universities and reports their destinations at 6 months after graduation. The results show that, when graduating in a recession, students from less advantaged family backgrounds are more likely to become unemployed, to work part-time, and to earn less than students from more advantaged families. There is evidence that professional networks established while at university are important in explaining some of these socio-economic gaps in outcomes.

JEL classifications: I24, I26, J23, J24

1. Introduction

Higher education (HE) participation has increased dramatically in the UK in the last few decades. Among the cohorts born in the 1960s, only around 10% graduated from university.

Among those born in the early 1990s, nearly 40% had a university degree. Despite the introduction of student fees in the early 2000s, and a steep increase in their value in 2012, there had a steady upward trend in the enrolment of students from low-income families and a reduction in the socio-economic gap in participation (Murphy *et al.*, 2019).

These changes have been encouraged by the belief that education has an important role in reducing the inter-generational transmission of advantage and in promoting social mobility. This may well be the case, as graduates have better labour market outcomes than non-graduates and are less severely affected by negative shocks (Henehan, 2020). However, it is still unclear whether a university degree is enough to guarantee that individuals from different socio-economic backgrounds enjoy the same labour market rewards later on in life.

Graduates' career prospects are affected by factors other than family background, such as labour market conditions at time of graduation. Indeed, the first job has been found to affect overall employment prospects (Von Wachter and Bender, 2006), and recent research has shown that the state of the business cycle at the time of graduation matters for early and long-term graduate careers (Oyer, 2006; Kahn, 2010; Oreopoulos *et al.*, 2012). One aspect that has received less attention in the literature to date is whether a recession has different impacts on students from different family backgrounds. If this were the case, graduating in a tough labour market could widen socio-economic gaps in graduate outcomes over a long period of time.

One reason why the effects of a recession might depend on a student's family background is that the latter influences the process of human capital accumulation. Students from high socio-economic status (SES) families are more likely to graduate with better grades or from more prestigious universities. Furthermore, these students might engage in a wider range of extra-curricular activities, such as participation in team sport or volunteering, and accumulate additional skills (e.g. teamwork or negotiating skills) valued by employers. So, differences in human capital could be an important reason why students from high-SES families might be less affected by a recession at graduation.

Apart from differences in human capital, there could be at least two other possible mechanisms at play. One is through the impact of the recession on geographic or spatial mobility. The other is through the effect of the recession on access to and effectiveness of social and professional networks. Both these factors relate to the process of job search.

Although the relationship between economic downturns and labour mobility is still debated (Levy *et al.*, 2017), recent evidence shows that the Great Recession might have reduced opportunities for geographical re-location due to its effect on the housing market (Brown and Matsa, 2020). Geographical mobility is generally positively correlated with better earnings (Clarke, 2017), even among recent UK graduates (Kidd *et al.*, 2017). It is therefore possible that during a recession students from less advantaged families—who are more likely to study closer to home (in our data 57% of low-SES students study in the same region as their family home compared to 27% of high-SES students)—might find themselves restricted to their local labour markets. If these local labour markets are also more vulnerable to an economic downturn, this will lead to widening socio-economic inequalities in outcomes. Indeed, a recent report from the Social Mobility Commission points to a strong relationship between social deprivation and geography, with evidence that areas of social disadvantage are clustered in rural and coastal towns and former industrial towns and cities (Social Mobility Commission, 2017). Evidence shows that these areas were disproportionately hit by the 2008 recession and did not experience a significant recovery even afterwards (Townsend and Champion, 2014; Beatty and Fothergill, 2020).

Another explanation is that individuals from more advantaged SES groups might have access to wider and more effective social and professional networks, and this might facilitate the process of finding a job match. The network literature has emphasized the importance of relationships with other employed individuals living in the same neighbourhood (Bayer *et al.*, 2008), or working in the same firm (Cingano and Rosolia, 2012). These relationships can differ by family background if individuals from different SES groups have access to different networks (Trimble and Kmec, 2011). Most importantly, the same networks can be less effective for low-SES students during a recession if a downturn has a more damaging impact on workers with lower levels of education or in non-professional occupations. Evidence from the UK shows that this was indeed the case during the 2008 recession, with low-skilled jobs being disproportionally more affected (Coulter, 2016).

This article provides new evidence about the relationship between SES and the effects of an economic downturn on the early labour market outcomes of several cohorts of students graduating from English universities. Our empirical strategy exploits the change in labour demand due to the Great Recession to investigate whether graduates from different SES groups were affected in different ways by the economic downturn. In other words, if luck matters—because those entering into the labour market in a recession are disadvantaged for no reason other than bad timing—does this affect graduates with different socio-economic opportunities in the same way?

Our analysis is based on the UK Destination of Leavers from Higher Education (DLHE) survey, which collects information on the labour market destinations of a large sample of students graduating from all UK Higher Education institutions. We match this dataset with graduate unemployment rates defined by field of study in order to investigate the influence of the business cycle during the period between 2002–3 and 2011–2 on early graduate careers. Our main focus is on labour market outcomes 6 months after graduation, although we offer some evidence that effects persist 3 years after that using a smaller longitudinal sample.

We show that the costs of entering the labour market during a recession are unequally spread. Compared to graduates from an advantaged socio-economic background, disadvantaged graduates are less likely to enrol in postgraduate courses and more likely to become unemployed when graduating in bad economic conditions. The widening of the SES gap during periods of high unemployment is large—compared to high-SES graduates, low-SES graduates are less likely to stay in education by 8.6% and more likely to be unemployed by 7.4%—and robust to controlling for a rich set of student demographic characteristics and indicators for human capital, such as degree classification and university attended. We further show that even among those graduates who become employed, tight labour demand conditions at graduation widen SES differences in access to full-time positions, professional occupations, graduate jobs, and salary.

We investigate some of the possible mechanisms which could explain the heterogeneous effects of the recession by SES. The most important result here is that graduates from low-SES backgrounds who enter the labour market during a recession are less likely to find a job with a new employer, and (correspondingly) more likely to continue working with a previous employer. In most cases, this means that they continue working in a non-placement job, that is a job not related to their qualification. This suggests that differential access to professional networks, particularly university job-placements and internships, is an important channel through which SES differences in outcomes may persist in the long run.

With this article we intend to offer different contributions to the literature in labour economics. Many studies have considered the effects of graduating in a recession (e.g. Kahn,

2010; Oreopoulos *et al.*, 2012; Altonji *et al.*, 2016). These previous analyses have emphasized the importance of field of study or career prospects in increasing or decreasing the penalty of graduating during bad economic times. To the best of our knowledge, this is the first article that focuses on differences by socio-economic status instead. This is very important from a policy perspective, as it helps us to understand whether students from more disadvantaged backgrounds need additional support not only during the transition from school to higher education, but also in moving from university to the labour market. Evidence of widening SES differentials in graduate outcomes during a recession would be a strong argument in favour of government schemes that support graduates from disadvantaged backgrounds during an economic downturn, for example.

A second important contribution of this article is that we are able to offer an analysis of some of the mechanisms which might explain why a recession differently affects graduate labour market outcomes depending on graduates SES. Our data are sufficiently rich to allow us to consider the role of geographic mobility and social and professional networks while controlling for other differences across individuals, such as economic conditions at the time of enrolment, the university attended, and the degree classification achieved. Other papers in this literature have pointed out that a recession can have differential effects according to the field of study (Altonji *et al.*, 2016), ethnicity, or gender (Schwandt and von Wachter, 2019), but have not been able to examine the mechanisms by which these differences come about. A notable exception is the work by Oreopoulos *et al.* (2012). Here the authors show that students graduating in subjects associated with slower wage growth suffer disproportionately and provide evidence about the role of job mobility in reducing the effects of bad economic conditions at entry.

Another difference between this article and other existing work on this topic is that we exploit variation in labour market conditions at entry determined by differences in unemployment by field of study. All the studies which look at the penalty of graduating in a recession tend to use geographical variation instead. We argue that variation by field of study is more appropriate in our context because the geographical mobility of graduate students is very high in the UK, with students often moving very large distances between their family home and university, as well as between university and the first place of work.

2. Empirical strategy

Our identification strategy is similar to what has been commonly used in the literature on the effect of graduating in a recession (Kahn, 2010; Oreopoulos *et al.*, 2012; Altonji *et al.*, 2016; Cockx and Ghirelli, 2016; Liu *et al.*, 2016), although it takes into account specific features of the UK labour market and introduces a focus on the SES gap.

Our unit of analysis is a graduate i, who obtained a degree from a HE institution (HEI) h (this subscript is omitted for simplicity), and is observed at time t, 6 months after graduation. Our proxy of socio-economic background, SES, is a categorical variable indicating whether students are from a high, middle, or low SES. Our principal interest is to establish whether there is any impact of unemployment on graduate destinations. To capture the macroeconomic condition at graduation, we use the rate of unemployment at the level of unit j, which represents either the region where graduates resided before entering HE or the field of study. The idea here is to proxy the labour demand conditions of graduates with an indicator of regional unemployment related to the place of their family residence or the rate

of unemployment of older cohorts of graduates from the same field of study, irrespective of their geographical location. Our initial specification is:

$$y_{ijt} = \alpha + \beta U_{j,t-1} + \gamma SES_i + \delta U_{j,t-1} \times SES_i + \theta X_i + \mu_j + \mu_j \times t + \nu_t + \rho_b + \omega_{ijt}, \quad (1)$$

Here the coefficient of interest is δ, which captures the way in which unemployment has a different effect on the outcome according to the SES of the individual. Notice that unemployment is measured in the last 12 months before the survey (the survey takes place 6 months after graduation) to take into account the fact that most students start sending their job applications well in advance of their graduation date. We further include fixed effects for each unit j (μ_j), representing either region or field of study, time trends specific to unit j ($\mu_j \times t$), as well as year of graduation dummies (ν_t), and university fixed effects (ρ_b).[1] Standard errors are clustered by region/field of study to take into account possible correlation of individual outcomes within geographies or fields over time. Given the small number of clusters, we implement the wild cluster bootstrap procedure as recommended in Cameron and Miller (2015).

All the existing studies in the literature use as their main measure of labour demand an indicator of unemployment which varies according to the geographical location of the student. Very often this is the state or the region where the student is observed in her first employment destination (see e.g. Oreopoulos et al., 2012). We think that the use of regional unemployment might not be appropriate in our context, however. The UK is much smaller compared to USA or Canada, where most of the other studies are to be found, and the costs of moving from one area to another in search for a job are significantly lower. Moreover, our study focuses on graduate students, and there is strong evidence that individuals with high levels of education are very geographically mobile (Faggian et al., 2007; Hoare and Corver, 2010; Machin et al., 2012). Indeed, in the UK, students move very large distances even to attend their preferred HEIs (in our data this is on average 110 km, with >50% of the sample travelling 84 km or more).

We propose to use instead *field-specific* graduate unemployment rates. This assumes that the labour market of graduates is national in geographic reach but segmented across different sectors defined by field of study. To take into account that individuals who graduate in different fields of study might experience changes in labour demand for reasons that are not related to the recession but reflect instead sectoral shifts in the economy, we also include field-specific time trends.

Using the unemployment rate by field of study has another important feature. It takes into account the potential response of workers moving across sectors and industries (as well as geographically) as a consequence of a downturn. This is important if there are some fields of study which are 'naturally' more resilient to downturns because they allow graduates to be employed in a variety of different sectors or industries. To see how important this aspect can be, Supplementary Appendix Table A.1 shows the Hirschman–Hirfindahl Index, an index of specialization which indicates whether graduates in a certain field of study work in a wide or narrow range of occupations (Blom et al., 2015). There is clearly a lot of heterogeneity across fields of study. Degrees such as Medicine and Education are associated to few occupations or industries. Others, such as Biology and Physics, see their graduates employed across a wider range.

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1 Specifications with regional unemployment also include field-specific dummies but not field-specific time trends; specifications with unemployment by field of study include geographic indicators but not geography-specific time trends.

One potential issue of our strategy is that variation in labour demand might affect the decision to enrol in HE and therefore the composition of each cohort (Clark, 2011; Meschi et al., 2011; Tumino and Taylor, 2015). Conditioning on observable socio-demographic and academic characteristics of graduates (X) including gender, ethnicity, disability status, and degree classification, might not be enough to mitigate this concern. Thus, we additionally condition on labour market demand at the time of enrolment. To do so we use the unemployment rate at the Local Authority District (LAD) level.[2] We consider that this is the relevant proxy of the labour market circumstances affecting students and their families before university decisions are made since the geographical mobility of school leavers is much more restricted than that of graduate students (Clarke, 2017).

The LAD unemployment rate is measured at time of enrolment in HE, $t-4$, and is matched to each student using the area of family domicile (U_d).[3] We also consider the interaction of U_d with SES, to allow for different effects on different subgroups of the population. Finally, we also include LAD dummies, τ_d. Our main specification therefore is:

$$y_{ijdt} = \alpha + \beta U_{j,t-1} + \gamma SES_i + \delta U_{j,t-1} \times SES_i + \lambda U_{d,t-4} + \sigma U_{d,t-4} \times SES_i + \theta X_i \\ + \mu_j + \mu_j \times t + \nu_t + \rho_b + \tau_d + \zeta_{ijdt}. \tag{2}$$

There are two other main potential threats to the identification of the effect of unemployment by field of study on graduate labour market outcomes. First, we need to consider whether students can respond to changes in unemployment by changing the subject studied at university, as this would make their labour market conditions at graduation endogenous. Secondly, we need to discuss whether students can choose the timing of graduation.

In England, students typically enrol at university when they are 18 years old. The choice of field of study is conditional on the subjects and marks that students obtain during the previous stage of education, when they are 16–18 year old. For example, programmes with an important scientific content, such as Engineering, often require having studied mathematics earlier on. Students are also required to have achieved a particular mark in the subjects taken during the last stage of their secondary school (A-level exams), although the specific threshold usually differs across different universities. Similarly, in order to study a certain subject during the last years of schooling, students need to have performed well in related subjects during the previous stage of education (age 14–16 years). This means that specialization into an area of study, and indeed the decision to continue into HE, usually occurs quite early in the school cycle—usually by the age of 16 years (UCAS, 2021).[4]

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2   To deal with the potential endogeneity issue of the business cycle affecting HE enrolment, Kahn (2010) predicts the national unemployment rate with birth year and state unemployment rate with birth year and state of residence at the age of 14 years. Our strategy is similar in the sense that we deal with the endogeneity problem by conditioning on the unemployment rate at time of enrolment in the area where students had their domicile before entering HE.

3   The data here are from the Office for National Statistics (ONS) Claimant Count statistics (https://www.nomisweb.co.uk/) and capture unemployment rates for the overall population, including graduates and non-graduates.

4   This setting refers to students who choose an academic track. It is also possible to enrol at university after obtaining a vocational qualification and the steps are very similar. However, the vocational route is by far less common than the academic route accounting for only 7% of undergraduate students in 2014, for example.

Once enrolled, dropout is much less of a problem in the UK than in other countries, ranging from 6% to 7% on average. Switching institution or course of study is also relatively uncommon, with only 3% of students affected (Vignoles and Powdthavee, 2009). Furthermore, each university course is usually associated with one or two specific fields of study, and no general curriculum is offered initially, as in the USA. A bachelor degree usually lasts 3 years, and its duration is fixed because students cannot choose when to take exams, unlike what happens in other European countries. These features make the educational system in England an ideal setting in which to investigate the role of the business cycle on graduate labour market outcomes, as students are largely unable to react to unexpected changes in labour demand conditions.[5]

3. Data and descriptive statistics

3.1 Data and sample selection

Our data come from the DLHE, which is carried out 6 months after graduation and sample graduates from all UK universities.[6] The survey collects information on activity status, occupation, salary, and type of contract of each respondent. The data are linked to the Universities and Colleges Admissions Service student applications, which contains student demographic characteristics, and some information about students' education before attending university. Other information includes: university grades (degree class), subject, and the HEI attended. The DLHE started in the academic year 2002–3 and in this article we use information up to year of graduation 2011–2.

Our interest is the transition from HE to work, so we keep students completing their first degree and exclude postgraduate courses, foundation degrees, HE diplomas, and certificates. This represents 82% of the original sample. We consider full-time, non-mature students only, as they are less likely to be influenced by family responsibilities, and UK nationals (>90%) living on the mainland. We further restrict our analysis to English universities because comparisons with the other UK countries would be difficult due to institutional differences in tuition fees, maintenance support, and duration of study.

Some students are in courses which combine different subjects (13%). As the percentage of time spent on each subject is recorded in the data, we assign a field of study by considering the courses attended for >50% of the time.[7] Another small number of observations (15,650) are dropped because the field of study does not find an equivalent in the Labour Force Survey, which is our source of information on field-specific unemployment rates.

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5   During the period analysed, there have been significant changes to the system of HE financing, including to the amount of tuition fees and support for maintenance costs. These changes could impact both the number and socio-economic composition of those going to university. Our specifications take into account these possible effects by including cohort dummies and SES dummies throughout.

6   The response rate of the survey is about 80% for the cohorts considered in this article. The sample is not fully representative of the population of all UK graduates, instead it is positively selected with higher achieving and more advantaged students being more likely to participate.

7   About 9% of students study for a joint degree (i.e. combination 50–50%). In this case, we randomly retain one of the two subjects studied. Excluding these students from our sample does not affect our results.

We also drop observations for which we cannot derive an SES indicator, excluding records with missing information on: home domicile (6,860), type of school attended (private versus state), or participation in HE at the area level (152,710). Finally, we drop all students included in the issued sample but who did not reply to the survey (247,095). This is probably the most controversial selection. We check whether patterns of response by SES differ with conditions at graduation, but we find no evidence that this is the case. Our final sample consists of 1,054,865 records.[8]

3.2   Measuring socio-economic status

To derive an indicator of SES, we use three variables observed before students enrol in HE. The first indicates the type of secondary school attended, codified as state versus private. The second variable is the Low Participation Neighbourhood (LPN) marker, a categorical variable splitting graduates into five groups according to the rate of HE participation in the neighbourhood of residence at the time of application to university. The third variable is the Index of Multiple Deprivation (IMD), a widely used measure of socio-economic conditions in the UK, which we match to graduates on the basis of the postcode of family residence.

Supplementary Figure A.1 (panels a, b, and c) in the Supplementary Appendix, shows the distribution of the IMD, LPN, and school variables across the years. On average, about 13 and 5% of graduates come from the most deprived areas in terms of IMD and LPN, respectively. Almost 90% of graduates instead come from state schools. As documented elsewhere, we see an increase in the HE participation of students from the most deprived areas, with a corresponding narrowing of the SES gap (Crawford, 2012).

Next, we combine these indicators to construct an overall SES index.[9] We split this new index into quintiles, then group the quintiles in the middle to form a unique category (middle SES), retaining the highest and the lowest quintiles to represent high and low SES, respectively. This approach makes use of all the information on SES in the data and allows us to consider compositional changes in the student population, as the index varies over time. Supplementary Appendix Figure A.1 (panel d) shows that our SES index changes over time in a way similar to the original indicators, reflecting a reduction of the HE SES gap over time.

Supplementary Appendix Table A.2 shows the characteristics of graduates broken down by SES (columns 1–3). There are differences across several dimensions. For example, there is significant variation in the type of university attended and the subject studied, although this is not so across all subjects. We also see that high-SES students have a higher propensity to move geographically; about 57% of low-SES students study in the same region of family residence, compared to 39 and 27% among middle- and high-SES students.

3.3   Outcomes

We present all our results separately for (i) activity status and (ii) job attributes. This is to highlight the fact that in the second group of outcomes, we consider only students in full-time or part-time employment at the time of the survey. We do not model this selection, as

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8   To comply with requirements from the data provider observation numbers are always rounded to the nearest 5.

9   Section B in the Supplementary Appendix explains in detail how this index is constructed.

we lack a credible identifying condition. A similar approach is followed in many other studies in this literature (e.g. Kahn, 2010; Altonji *et al.*, 2016).

In analysing *activity status* at 6 months after graduation, we first distinguish between academic and professional postgraduate programmes. The former are postgraduate research or taught programmes such as masters, while the second group consists of diplomas, certificates, or other professional qualifications (e.g. the Postgraduate Certificate in Education which gives the opportunity to become a teacher). Notice that these programmes differ in their job market prospects, length, and in the likelihood of getting financial aid. Professional programmes, for example, are more likely to secure a specific job and their students are more likely to benefit from bursaries. We then consider whether graduates are active in the job market either by working part-time or full-time, or because they are unemployed. The final group includes 'other' activities such as: voluntary jobs, unpaid internships, working and studying, and other not specified.

We then focus on the *job attributes* for those graduates who are employed 6 months after graduation. We consider: the likelihood of working full-time versus part-time, whether working in a professional or managerial occupation, in a graduate job (students are asked whether their degree is required for the job), and on a contract that is permanent or lasts for more than 12 months. Finally, we consider the (natural log of) self-reported annual gross salary (at 2012 prices), the latter being available for full-time employees only.[10] Supplementary Appendix Table A.3 reports the mean values of these outcomes at 6 months after graduation. On average, middle- and low-SES graduates have worse outcomes than high-SES graduates. For example, while 7% of high-SES graduates experience unemployment at six months after graduation, the percentage rises to 9% for low-SES graduates.

Fig. 1 and 2 show changes in labour market outcomes over time and by SES. The vertical line at 2008 shows the beginning of the recession in the UK. These figures help us to establish three things. First, there is a visible SES gradient: high-SES graduates perform significantly better than middle, and then low-SES graduates. Secondly, after the recession there is a change in the trend, and this is true for all SES groups. Thirdly, for most outcomes, the SES gap widens in the period post-2008. For example, the percentage of low-SES graduates who report being unemployed in the period pre-2008 is on average 7%, compared to 5.7% for high-SES graduates (Figure 1.e). In 2008, unemployment jumps up for all three groups, but in 2011—when the total number of unemployed reached a peak of 2.68 m—the percentage of low-SES graduates in unemployment is above 11%, while this is 7.8% for those in the high-SES group. What was a high–low SES gap of about 1 percentage point before the recession more than doubles a few years later.

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10 Annual salary is reported with a large number of missing values (only 308,765 replied to this question out of the 575,870 graduates in a full-time job). Given this, and the fact that this variable is self-reported we test our model on an alternative measure, imputing earnings from the Annual Population Survey (APS). We do this by matching the DLHE with the APS on six dimensions: region, full-/part-time job, number of employees in the workplace, permanent versus fixed and temporary contract, industry, and occupation (three digits). Our estimates when using the imputed salary at 6 months after graduation are very similar to what we obtain when using self-reported salaries.
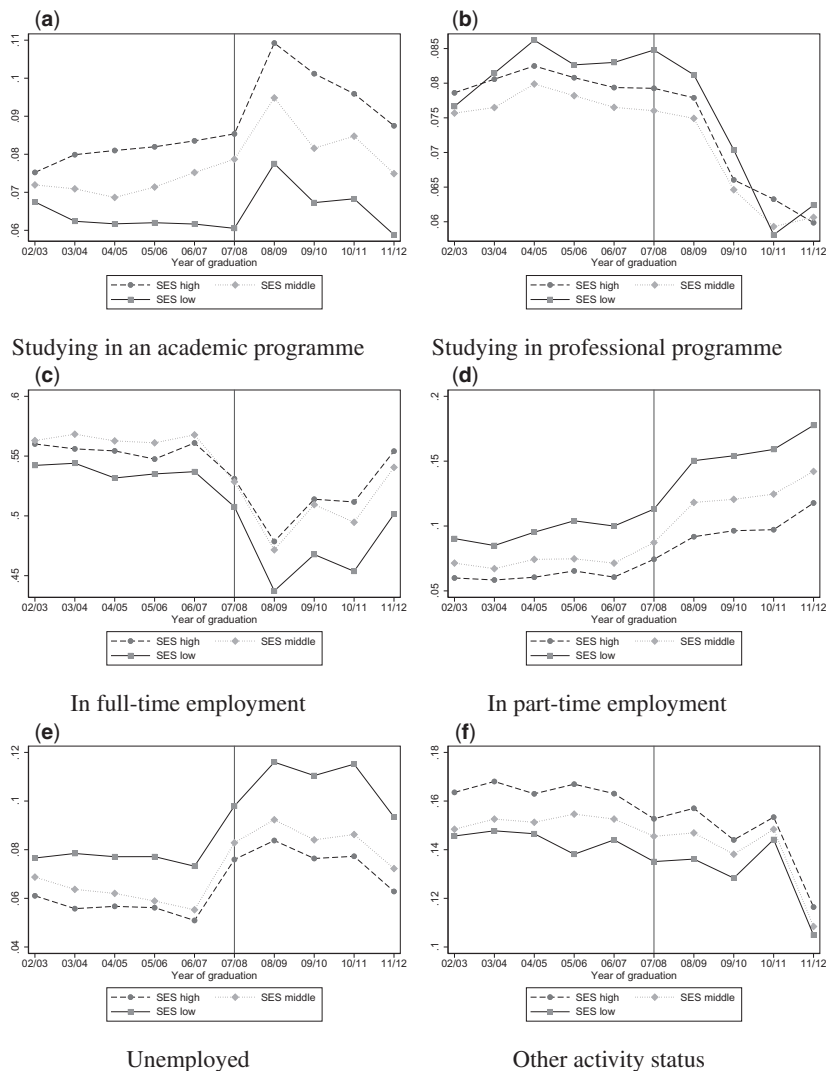
Fig. 1. Labour market outcomes—Activity status.

(a) Studying in an academic programme.

(b) Studying in professional programme.

(c) In full-time employment.

(d) In part-time employment.

(e) Unemployed.

(f) Other activity status.

Source: DLHE survey 2002–3 to 2011–2.

Notes: Activity status 6 months after graduation, see Section 3.3 for a definition of each variable.

3.4   Capturing the business cycle

To capture labour market conditions at graduation, we use unemployment by region or field of study. Supplementary Appendix Figure A.2 in the Supplementary Appendix shows the yearly average unemployment rate by region obtained using the Labour Force Survey.
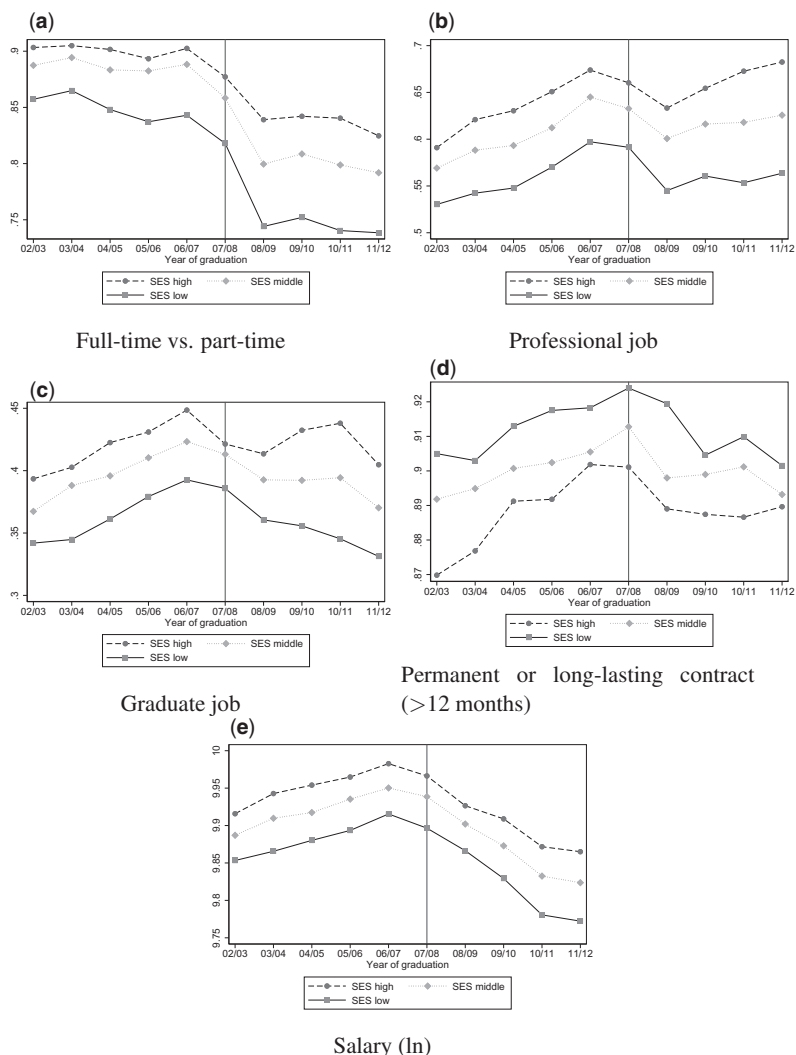
Fig. 2. Labour market outcomes—Job attributes.
(a) Full-time versus part-time.
(b) Professional job.
(c) Graduate job.
(d) Permanent or long-lasting contract (>12 months).
(e) Salary (In).
Source: DLHE survey 2002–3 to 2011–2.
Notes: Job attributes of students in employment 6 months after graduation, see Section 3.3 for a definition of each variable.

We see that there is significant variation in the way different regions respond to the recession, with the highest increases in unemployment found in the North of England. Field-specific unemployment rates are constructed using the graduate population aged 21–65. Supplementary Appendix Figure A.3 shows the variation over the period considered. As we can see, there is significant heterogeneity across all fields of study even within the Science,

Technology, Engineering, and Mathematics (STEM) and non-STEM categorization. For example, within STEM subjects 'Medicine & related subjects' exhibits a low and relatively constant level of unemployment of around 1–2%. Instead, for graduates in 'Architecture & Engineering' unemployment goes from 2% in the pre-recession years up to 4% in 2012, most likely as a consequence of the drop in activity in the construction sector. The recession clearly affected different sectors of the economy in different ways, and this is what we will exploit in our analysis.

Supplementary Appendix Table A4 shows unemployment rates for the whole population and by SES. The regional unemployment rate is always higher than that by field of study because it includes both graduates and non-graduates, and the latter experience on average higher unemployment. Another difference between the unemployment rate by region and by field of study is that the former differs by SES while the latter does not. This is because graduates from different SES groups come from different geographical areas but they do not differ significantly in their choices of degrees (see Supplementary Appendix Table A.2). Finally, Supplementary Appendix Table A4 shows that the unemployment rate at time of graduation almost doubled for those graduating between 2003 and 2012 and it increased sharply for the cohorts graduating in 2008 and in 2009. The change in unemployment from 2007 to 2011 (2 years before and 2 years after the recession hit) is about 3.2 percentage points for the regional measure and 1.4 percentage points for the field of study measure. These are modest numbers in absolute terms, but represent in both cases an increase of 60% over the pre-recession values.

4 Results

4.1 The consequences of graduating in a recession

We start by showing in Table 1 how socio-economic status and the business cycle affect the probability of being unemployed 6 months after graduation. We proxy labour market conditions using first the unemployment rate by region of family domicile (columns 1 and 2), and then by field of study (columns 3–5). All regressions include individual demographics and other characteristics (e.g. gender, ethnicity, disability, and degree class), and full sets of dummies for cohort, HEI, field of study, and region (or LADs). Region-specific or field-specific trends are controlled for depending on the measure of unemployment used. The last specification also includes unemployment at the time of enrolment in HE, measured at the level of smaller geographical units (LAD), and its interactions with the SES dummies.

The first thing we notice is that students from middle and low-SES families experience higher unemployment than students from high-SES families (omitted category). The effects are modest, but statistically significant. Specifically, middle-SES and low-SES graduates are 0.2 and 1.1 percentage point more likely to be unemployed 6 months after graduation than high-SES graduates. These effects are similar whether we control for unemployment at the regional level or by field of study.

Tough labour market conditions at graduation are associated with a higher probability of unemployment after graduation. Specifically, a 1 percentage point increase in the regional unemployment is associated with a 0.2 percentage point increase in the probability of being unemployed. This an effect a bit larger than that found in other studies. For example, Oreopoulos et al. (2012) find that the probability of being unemployed goes up by 0.1 percentage point in response to a 1 percentage point increase in the local unemployment rate in the first year after college graduation in Canada. When we consider unemployment by

Table 1. Unemployment 6 months after graduation

	(1)	(2)	(3)	(4)	(5)
Middle SES	0.002**	−0.005	0.002**	−0.001	−0.006*
	(0.001)	(0.003)	(0.000)	(0.007)	(0.003)
Low SES	0.011**	−0.015**	0.011**	−0.008	−0.016**
	(0.001)	(0.003)	(0.001)	(0.005)	(0.003)
U_{region}	0.002*	0.000			
	(0.001)	(0.001)			
Middle SES×U_{region}		0.001**			
		(0.000)			
Low SES×U_{region}		0.004**			
		(0.000)			
U_{field}			0.001	−0.000	−0.000
			(0.001)	(0.002)	(0.001)
Middle SES×U_{field}				0.001	0.001
				(0.001)	(0.001)
Low SES×U_{field}				0.006**	0.006**
				(0.001	(0.001)
Individual controls	Yes	Yes	Yes	Yes	Yes
Cohort dummies	Yes	Yes	Yes	Yes	Yes
HEI dummies	Yes	Yes	Yes	Yes	Yes
Field dummies	Yes	Yes	Yes	Yes	Yes
Region dummies	Yes	Yes	Yes	Yes	
Region time trends	Yes	Yes			
Field time trends			Yes	Yes	Yes
LAD dummies					Yes
$U_{LAD,t-4}$					Yes
$U_{LAD,t-4}$×SES					Yes
N	1,054,865	1,054,865	1,054,865	1,054,865	1,054,865

Source: DLHE survey 2002–3 to 2011–2, data on regional or field of study unemployment derived from the Labour Force Survey (various years).

Notes: Specifications 1 and 2 use unemployment rate by region of domicile, while specifications 3–5 use unemployment rate by field of study. Individual controls: gender, ethnicity, disability, degree classification, log distance between university, and domicile. Standard errors are clustered by region (1–2) or field of study (3–5) in brackets (wild cluster bootstrap 999 reps). The symbols * and ** indicate 5% and 1% levels of significance, respectively.

field of study (column 3), the effect is about 0.1 percentage point, more in line with the previous literature.

We also see that there are significant interactions between SES and unemployment. These interactions are also positive, to indicate that labour market conditions at graduation widen SES differences. Indeed, when we introduce these interaction effects, the raw SES differentials become negative suggesting that middle- and low-SES graduates would be *less* likely to be unemployed after graduation if all students faced the same labour market conditions at graduation irrespective of family background. Allowing for differences in unemployment rates at the end of secondary school, which might affect the decisions to enrol in HE, does not seem to change much any of these results, as we can see in column 5.

In comparing specifications which use regional unemployment with those that use unemployment by field of study we generally see stronger effects with the former measure. One explanation is that regional distances are small in the UK—especially relative to countries like the USA and Canada—and using regional unemployment could overestimate the effect of labour market conditions at entry by not taking into account the mitigating effects of geographic mobility. Another potential issue when using regional unemployment rates is serial correlation. Although there is more variation in regional unemployment rates than in unemployment rates by field of study (Supplementary Appendix Table A.4), regional unemployment at graduation might be more highly correlated with local (LAD) unemployment levels at enrolment, especially for low-SES students who are less geographically mobile (Supplementary Appendix Table A.2). For these reasons, in what follows we report results using unemployment by field of study. We conducted parallel analyses on the main outcomes considering unemployment at the regional level, and our findings are qualitatively similar (Supplementary Appendix Table A.5).

Table 2 considers the different destinations of graduates in terms of their *activity status* 6 months after graduation. The first two columns (top panel) of Table 2 show that, with respect to high-SES students, low-SES students are less likely to enrol in an academic programme when unemployment is high at graduation, and that this effect is statistically significant at the 5% level. More specifically, a 1 percentage point increase in the unemployment rate at graduation results in a 0.4 percentage point decrease in the probability that a low-SES student will continue studying in an academic programme with respect to a

Table 2. The effect of graduating in bad times by SES—Activity status

	(1)	(2)	(3)
	Academic programme	Professional programme	Full-time employment
MiddleSES×U_{field}	−0.002	0.002	−0.005[*]
	(0.001)	(0.002)	(0.003)
LowSES×U_{field}	−0.004[*]	0.005	−0.011
	(0.002)	(0.005)	(0.006)
U_{field}	0.003[*]	−0.002	0.000
	(0.001)	(0.003)	(0.000)
N	1,054,865	1,054,865	1,054,865
	Part-time employment	Unemployed	Other activity
MiddleSES×U_{field}	0.005[**]	0.001	−0.001
	(0.001)	(0.001)	(0.002)
Low SES×U_{field}	0.009[**]	0.006[**]	−0.003
	(0.002)	(0.001)	(0.003)
U_{field}	−0.002	−0.000	0.002
	(0.002)	(0.001)	(0.002)
N	1,054,865	1,054,865	1,054,865

Source: DLHE survey 2002–3 to 2011–2, data on field of study unemployment derived from the Labour Force Survey (various years).
Notes: The specification is the same as the one in column 5 of Table 1. Standard errors are clustered by field of study in brackets (wild cluster bootstrap 999 reps). The symbols * and ** indicate 5% and 1% levels of significance, respectively.

high-SES student. This is equivalent to a decrease of 6.2% on the mean (this is 0.065 as shown in Supplementary Appendix Table A.3). To relate this to the Great Recession, we multiply these numbers by 1.4, which is the average increase in graduate unemployment for older cohorts between 2007 and 2011 (see bottom row in Supplementary Appendix Table A.4), obtaining an effect of 8.6%. In contrast, we do not see a significant difference across SES groups in the probability of enrolling in a professional postgraduate programme.

We also see that graduating when unemployment is high increases the probability that low- and middle-SES students find employment in a part-time job. More specifically, the probability of working part-time for middle- and low-SES graduates increases by 0.5 and 0.9 percentage points, respectively, equivalent to 5 and 7% of the group-specific mean. There is a corresponding (not statistically significant) decrease in the probability that disadvantaged students find a full-time job, and for low-SES students only a statistical significant increase in the probability of becoming unemployed. The effect size is 5.3% for each 1 percentage point increase in unemployment, for a total increase of 7.4% for the period covered by the recent recession.

We run some specification checks by considering different definitions of SES and different measures of unemployment. Supplementary Appendix Table A.6 reports the results for our main outcome (unemployment) when we define family background according to an indicator of the general level of education of the resident population (column 2) or according to parental occupation (column 3).[11] We then use a definition of unemployment by field of study calculated only on individuals aged 20–40 years to get closer to a measure that might be relevant to young graduates (column 4). In our main specification (column 1), unemployment rates are calculated from 6 months prior to graduation to 6 months after graduation to reflect the period in which students search for jobs, but we also run a specification using unemployment rates 12 months prior to graduation (column 5). Finally, we consider what happens if we were to use a longer-term measure of unemployment at enrolment, taking a 5 year average of the local unemployment rate (column 6). All specifications show that higher rates of unemployment have a larger impact on low-SES students.

Table 3 shows the effects of unemployment at graduation on different job *attributes*. Notice that these are observed only for students who are either in a part-time or full-time job 6 months after graduation. Consistent with previous results, higher unemployment rates lead to worse outcomes for low- and middle-SES students across a range of indicators. Specifically, graduating when unemployment is high decreases the probability that an individual from a more disadvantaged family background holds a full-time versus a part-time job by 0.8 and 1.6 percentage points for middle- and low-SES, respectively. Low- and middle-SES graduates are found to be significantly less likely to work in a professional occupation or in a graduate job. Gross annual earnings of low-SES graduates (available for full-time workers only) are almost 1% lower than those of high-SES graduates.

All our outcomes are measured 6 months after graduation. To check whether the effects we observe in the short-term are likely to persist in the long-term, we use data from the *longitudinal* DLHE survey, collected 3.5 years after graduation. Only a subsample of graduates

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11 Information on parental occupation is available only from 2005–6 onwards and is missing for >16% of students.

Table 3. The effect of graduating in bad times by SES—Job attributes

	(1)	(2)	(3)
	Full-time vs. Part-time	Professional occupation	Graduate job
MiddleSES×U$_{field}$	−0.008**	−0.009**	−0.005**
	(0.002)	(0.002)	(0.002)
LowSES×U$_{field}$	−0.016**	−0.016**	−0.007
	(0.004)	(0.005)	(0.004)
U$_{field}$	0.003	−0.000	−0.004
	(0.003)	(0.001)	(0.003)
N	662085	661210	555265
	Permanent contract	Log salary	
MiddleSES×U$_{field}$	−0.001	−0.003	
	(0.001)	(0.001)	
LowSES×U$_{field}$	−0.001	−0.007**	
	(0.003)	(0.003)	
U$_{field}$	0.001	−0.005	
	(0.001)	(0.004)	
N	579,815	291,990	

Source: DLHE survey 2002–3 to 2011–2, data on field of study unemployment derived from the Labour Force Survey (various years).
Notes: The specification is the same as the one in column 5 of Table 1. Standard errors are clustered by field of study in brackets (wild cluster bootstrap 999 reps). The symbols * and ** indicate 5% and 1% levels of significance, respectively.

are contacted for the longitudinal survey and this is carried out biannually, which means we have data on four cohorts (2002–3, 2004–5, 2006–7, and 2008–9)[12]

Supplementary Appendix Table A.7 reports the results for the available outcomes at 3.5 years. We do not see many statistically significant coefficients, except on unemployment, where we document an increase in the SES gap when economic conditions at graduation are bad. There is also evidence that the salary of low-SES graduates is negatively affected, although the coefficient here is not statistically significant.

4.2 Heterogeneity
Next, we analyse whether graduating during a recession affects some students more than others. There could be differences by gender for example, or by degree class, as a good degree is a positive signal of the quality of human capital and is a safety net when the competition for jobs is tougher. The effects of the recession might also differ by field of study. For example, graduating in a field leading to a high paid job might reduce the negative effects

12 We use weights based on individual characteristics observed in the 6 months survey to account for the different probability of replying to the 3.5 survey. The regression model is the same as the one in the last column of Table 1, but since we have only four cohorts we do not include field-specific time trends.

Table 4. Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
Activity status	Academic programme	Professional programme	Full-time employee	Part-time employee	Unemployed	Other
			I=STEM vs. non-STEM			
MiddleSES×U$_{\text{field}}$×I	−0.001	0.008*	−0.001	0.001	0.001	−0.008**
	(0.002)	(0.003)	(0.006)	(0.002)	(0.001)	(0.002)
LowSES×U$_{\text{field}}$×I	0.001	0.017*	−0.012	0.002	0.004*	−0.011**
	(0.006)	(0.007)	(0.010)	(0.004)	(0.002)	(0.003)
N	1,054,865	1,054,865	1,054,865	1,054,865	1,054,865	1,054,865
			I=high vs. low specialization degree			
MiddleSES×U$_{\text{field}}$×I	0.004*	0.008**	−0.010**	0.002	0.003**	−0.006**
	(0.002)	(0.003)	(0.003)	(0.002)	(0.001)	(0.002)
LowSES×U$_{\text{field}}$×I	0.010**	0.017**	−0.027**	0.006*	0.007**	−0.013**
	(0.004)	(0.006)	(0.008)	(0.003)	(0.002)	(0.004)
N	1,054,865	1,054,865	1,054,865	1,054,865	1,054,865	1,054,865
Job attributes	Full versus part−time	Professional occupation	Graduate job	Permanent contribution	Log salary	
			I=STEM vs.non−STEM			
MiddleSES×U$_{\text{field}}$×I	−0.003	−0.003	0.001	−0.003	0.000	
	(0.003)	(0.005)	(0.003)	(0.002)	(0.002)	
LowSES×U$_{\text{field}}$×I	−0.010	−0.013*	−0.010*	−0.007*	−0.001	
	(0.006)	(0.006)	(0.004)	(0.003)	(0.013)	
N	662,085	661,210	555,265	579,815	291,990	

(continued)

Table 4. Continued

	(1)	(2)	(3)	(4)	(5)	(6)
	I=high vs.low specialization degree					
MiddleSES×U$_{field}$×I	−0.005	−0.013**	−0.010**	−0.003	−0.006	
	(0.003)	(0.004)	(0.003)	(0.002)	(0.005)	
LowSES×U$_{field}$×I	−0.014**	−0.031**	−0.022**	−0.008*	−0.010	
	(0.005)	(0.008)	(0.006)	(0.004)	(0.008)	
N	662,085	661,210	555,265	579,815	291990	

Source: DLHE 2002–3 to 2011–2, data on unemployment by field of study derived from the Labour Force Survey (various years).

Notes: We report only the coefficient of the interaction between unemployment, SES, and indicator variable I equal to one if the field of study is STEM or is characterized by a high degree of specialization (defined by the Hirschman–Hirfindahl index). The specification is the same as the one in column 5 of Table 1. Standard errors are clustered by field of study in brackets (wild cluster bootstrap 999 reps). The symbols * and ** indicate 5% and 1% levels of significance, respectively.

of graduating in a recession, although this was not found to be the case for the 2008 downturn in the USA (Altonji *et al.*, 2016).

We perform our heterogeneity analysis by means of a triple interaction, that is, the SES categories are interacted first with the unemployment rate by field of study and then with the characteristic of interest. We find that field of study is one of the dimensions that matters most. Table 4 shows that low-SES graduates who studied in STEM fields are mainly affected by the recession in terms of progression to further study, unemployment, full-time versus part-time work, access to professional occupations, graduate jobs, and permanent contracts.

We examine this issue further, and separate fields of study according to their degree of specialization as defined by the Hirschman–Hirfindahl index of occupational concentration (see Supplementary Appendix Table A.1).[13] Among the most specialized degrees we have 'Medicine & dentistry', 'Engineering & technology', and 'Architecture, building & planning', which are STEM subjects. We find that low-SES graduates in subjects characterized by a high degree of specialization are more likely stay on in further education and to become unemployed during a recession. Among those who find employment, we see a lower probability to be in a graduate job or in a professional occupation. These findings suggest that the more doors a degree opens (in terms of potential occupations) the more likely low-SES students are to escape poor labour market outcomes in periods of high unemployment.[14]

5. Potential mechanisms

The observed widening of SES gaps in graduate outcomes associated to bad labour market conditions at entry might arise because of unobserved (to the econometrician) SES differences in human capital. Although we consider here a population of first-degree, full-time graduates, we look at their situation 6 months after graduation, and we condition on university attended and degree class, there is still much we cannot control for. For example, there is obviously variation in human capital within a degree class, but we think this is not easily observable to employers as in the UK context degree class (rather than the actual GPA) is the most important indicator used when selecting candidates for a job interview (Association of Graduate Recruiters, 2016).

More relevant might be differences in qualifications achieved before enrolling at university (mainly A-levels results), as these are observable to employers. Our data do not have information on these qualifications, but only an aggregate indicator—the tariff score—which combines the value of different qualifications according to the grade achieved. The tariff score is only observed for students who graduate from 2005–6 onwards, so we test the robustness of our results to the inclusion of this variable in a separate set of regressions. We find that adding tariff score does not change any of our main results, as we can see from Supplementary Appendix Table A.8.

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13 Here we define 'specialized' a field of study with a value of the index above the median (0.15).

14 Notice that in general there is a positive correlation between the Hirschman–Hirfindahl index of occupational concentration and the probability of being in a graduate job, so these types of degrees are generally linked to good labour market outcomes. What we show here is that this might not be the case for low SES students during a period of recession.

Table 5. Mechanisms

	(1)	(2)	(3)	(4)
	(log)Distance domicile-workplace	Social network	Employer website	Agency
MiddleSES×U$_{field}$	0.004	−0.005**	−0.000	0.001
	(0.003)	(0.001)	(0.004)	(0.002)
LowSES×U$_{field}$	0.020*	−0.014**	0.004	0.004
	(0.008)	(0.002)	(0.003)	(0.004)
U$_{field}$	−0.025*	0.005**	0.007	−0.003
	(0.011)	(0.002)	(0.007)	(0.002)
N	621685	536925	536925	536925
	(log)Distance HEI−workplace	New employer	Previous employer non−placement	Previous employer placement
MiddleSES×U$_{field}$	−0.027*	−0.003**	0.008**	−0.005**
	(0.013)	(0.001)	(0.002)	(0.001)
LowSES×U$_{field}$	−0.051*	−0.005	0.013**	−0.008**
	(0.022)	(0.003)	(0.004)	(0.003)
U$_{field}$	0.027	0.000	−0.005**	0.005
	(0.015)	(0.001)	(0.002)	(0.002)
N	621,750	527,890	527,890	527,890

Source: DLHE 2002–3 to 2011–2, data on unemployment by field of study derived from the Labour Force Survey (various years).
Notes: The specification is the same as the one in column 5 of Table 1. Standard errors are clustered by field of study in brackets (wild cluster bootstrap 999 reps). The symbols * and ** indicate 5% and 1% levels of significance, respectively.

Another possibility is that students from different SES backgrounds differ in the type of extracurricular experience they accumulate during university. For example, students from high-SES families might be more likely to engage in volunteering or take on leadership roles, either because they do not need to take on part-time jobs to help with their maintenance costs or because they have better information about the labour market value of these activities. If these activities provide skills that are valued by employers, and we do not observe them, then we might be attributing these differences in skills to SES differences, thus overestimating the impact of SES during a recession. However, there is still little causal evidence that these activities positively affect labour market outcomes (Saniter and Siedler, 2014), and recent studies find no evidence that students differ in their engagement in these activities along the SES dimension (Delavande *et al.*, 2020).

As discussed earlier, we might expect that a recession reduces the degree of geographical mobility of job seekers, and that this might be one of the mechanisms which lead to an increase in SES differences in graduate outcomes (Social Mobility Commission, 2017). While our data show that graduates from a low-SES background find a job closer to the initial domicile, there is no evidence that this is more likely to be the case during a recession. Indeed, our results in Table 5 (column 1) indicate that the distance between the first job

after graduation and the domicile actually increases for low- versus high-SES students during an economic downturn.[15]

Graduates from different SES groups might have access to different types of social networks (Trimble and Kmec, 2011), and during a recession the role and the effectiveness of these networks differs by SES. The DLHE survey asks questions about the channel through which graduates found their first job, and this includes 'Personal contacts, including family and friends, networking'. In Table 5 (column 2), we see that during the recession middle- and low-SES students are less likely to find a job through social networks. In contrast, there is no evidence of an effect on other job search channels, such as employers' websites or recruitment agencies (columns 3 and 4). This suggests that low-SES graduates have less access to social networks during a recession or that their social networks are less effective. However, we are cautious in giving too much emphasis to this finding for two different reasons. First, the survey question on job search channels changed in 2008, coinciding with the sharp increase in unemployment. Secondly, additional analysis (data not shown) reveals that jobs found through social networks (as defined here) generally do not lead to better outcomes than jobs found through other channels.

The last aspect we consider pertains to SES differences in access to professional networks. We proxy the latter using information on previous jobs. The survey asks respondents whether their job at 6 months was with a previous employer and whether it was a placement job.[16] Placement jobs involve an element of training or project work and thus might represent a stepping stone towards good graduate destinations. Some of them are unpaid and usually they are geographically spread out, thus requiring relocation. On the basis of this and previous studies on the topic (see Faggian *et al.* (2010) and references therein), we would expect high-SES graduates to be more likely to end up in a placement job compared to low-SES graduates, implying that the former have better access to professional networks. The question we ask here is whether access to professional networks is more important in a recession period.

In our data the vast majority of students find their first job after graduation with a new employer (about 75%), but there is a significant proportion who return to their previous employer, especially in non-placement jobs (about 20%). There are significant SES differences in accessing new employers, with low-SES graduates being less likely to do so as compared to middle- and high-SES graduates. After the beginning of the 2008 recession, there is a sharp decrease in the proportion of students finding a job with a new employer, and a corresponding increase in the proportion going back to previous employers (see Supplementary Appendix Figure A.4).

There is also evidence that the SES gap in access to professional networks increases with the recession. This is what we find in Table 5, where we see that middle and low-SES graduates who are employed 6 months after finishing their studies are less likely to be found in a previous placement job and more likely to be in a previous non-placement job (columns 3

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15 Notice that all regressions control for distance from the domicile and the HEI attended as a proxy for the propensity to be geographically mobile.

16 A placement job is defined when the student worked on a sandwich placement, on another kind of placement or project work, or on an internship. We also know whether the job was held before, during, or before and during the course of study. In another specification we define a job to be a placement job only if was hold during the course of study. Results do not change with this further restriction.

and 4). This is consistent with low-SES graduates finding a job closer to the HEI (column 1) as non-placement jobs held while studying are likely to be geographically close to the HEI attended by students (see also column 5). In results not shown, we find evidence of a significant and positive association between job attributes at 6 months after graduation (full time versus part time, being in a professional occupation, etc.) and having had a job placement with the same employer.

Our interpretation of these findings is that during periods of higher unemployment, high-SES students are able to rely more heavily on their previous work experience, especially the type of experience that is relevant to their field of study and career. Our data are unable to tell us whether low-SES students have fewer opportunities to obtain placement jobs while studying, but according to a recent study (Delavande *et al.*, 2020), only 26.5% of low-SES students are able to accumulate non-academic work experience related to their field of study, as compared to 34.5% for high-SES students. It seems, therefore, likely that access to placement jobs could be important in explaining the unequal effects of a recession.

6. Conclusion and discussion

In this article, we provide new evidence that entering the labour market during an economic downturn increases SES differentials in graduate outcomes. Specifically, we show that the sharp increase in unemployment experienced in the UK between 2008 and 2011 translated into wider SES gaps across a range of labour market outcomes measured 6 months after graduation, including employment, salary, and access to professional and graduate occupations. This is so after taking into account the effects of compositional changes in the population of graduates, observed and unobserved university characteristics, and economic conditions at the time of enrolment.

We consider different mechanisms through which a recession might widen SES inequalities. We find limited evidence that this is due to differences in human capital or geographic mobility. Our findings suggest that differential access to professional networks might be important instead. For example, we see that during a recession low-SES graduates are more likely than high-SES graduates to return to their previous employer, particularly where this offered a non-placement job.

We can think of several policy implications arising from this study. The most obvious is that students from more disadvantaged backgrounds should be offered additional support not only during the transition from school to higher education—as it happens now through widening participation programmes—but also when moving from university to the labour market. This could take the form of direct support through subsidised work placements, assisted job search, re-training programmes, or by providing hiring subsidies to employers.

We also need to understand why disadvantaged students seem to have differential access to professional networks at the time of graduation and what role information about the value of job placements plays. Universities might help to reduce socio-economic inequalities by encouraging more students, particularly those from a low-SES background, to take on placement and internship opportunities and offering better career advice not only at the time of graduation but also throughout the course of study. Additionally, adequate financial support could be provided to disadvantaged students to take on these opportunities, as most placements are unpaid and, because of this, only accessible to high-SES individuals (Fournier *et al.*, 2019).

Supplementary material

Supplementary material is available on the OUP website. These include the Supplementary Appendix, the data used in the analysis that we are able to share, the Stata '.do' files used to generate the results reported in the article, a readme.docx file with additional information about what the individual files contain. The main data used in this article are from the Destination of Leavers from Higher Education (DHLE), a survey of UK graduates. Access can be requested through the Higher Education and Statistical Agency (HESA), see www.hesa.ac.uk. Unemployment rates by region and field of study were derived using the Labour Force Survey (various years). These data are publicly available and can be accessed through the UK Data Archive, see www.data-archive.ac.uk. Other geographical and labour market data that have been used in the paper can be obtained from Nomis—Official Labour Market Statistics (www.nomisweb.co.uk).

References

Altonji, J.G., Kahn, L.B., and Speer, J.D. (2016) Cashier or consultant? Entry labor market conditions, field of study, and career success, *Journal of Labor Economics*, **34**, S361–401.

Association of Graduate Recruiters (2016) *The AGR 2016 Annual Survey*, The Association of Graduate Recruiters, London.

Bayer, P., Ross, S., and Topa, G. (2008) Place of work and place of residence: Informal hiring networks and labor market outcomes, *Journal of Political Economy*, **116**, 1150–96.

Beatty, C. and Fothergill, S. (2020) Recovery or stagnation?: Britain's older industrial towns since the recession, *Regional Studies*, **54**, 1238–49.

Blom, E., Cadena, B.C., and Keys, B.J. (2015) Investment over the business cycle: Insights from college major choice. Institute for the Study of Labor (IZA), IZA Discussion Paper, No. 9167, Bonn, Germany.

Brown, J. and Matsa, D. (2020) Locked in by leverage: Job search during the housing crisis, *Journal of Financial Economics*, **136**, 623–48.

Cameron, A.C. and Miller, D.L. (2015) A practitioner's guide to Cluster-Robust inference, *Journal of Human Resources*, **50**, 317–72.

Cingano, F. and Rosolia, A. (2012) People I know: Job search and social networks, *Journal of Labor Economics*, **30**, 291–332.

Clark, D. (2011) Do recessions keep students in school? The impact of youth unemployment on enrolment in post-compulsory education in England, *Economica*, **78**, 523–45.

Clarke, S. (2017) Get a move on? The decline in regional job-to-job moves and its impact on productivity and pay, https://www.resolutionfoundation.org/app/uploads/2017/08/Get-a-move-on.pdf (1 September 2021, date last accessed).

Cockx, B. and Ghirelli, C. (2016) Scars of recessions in a rigid labor market, *Labour Economics*, **41**, 162–76.

Coulter, S. (2016) The UK labour market and the great recession, in Myant. M, Theodoropoulou. S, and Piasna A. (eds) *Unemployment, Internal Devaluation and Labour Market Deregulation in Europe*, European Trade Union Institute, Brussels, 197–227.

Crawford, C. (2012) Socio-economic gaps in HE participation: How have they changed over time?, *IFS Briefing Note 133*, Institute for Fiscal Studies, London, United Kingdom.

Delavande, A., Del Bono, E., and Holford, A. (2020) Academic and non-academic investments at university: the role of expectations, preferences and constraints, *Journal of Econometrics*, 10.1016/j.jeconom.2020.03.019 (1 September 2021, date last accessed).

Faggian, A., Jewell, S., and King, Z. (2010) The effect of term-time employment on UK higher education students, in L.K Valencia and B.J. Hahn, (eds) *Employment and Labor Issues: Unemployment, Youth Employment and Child Labor*, Nova Science Publishers, Hauppauge, NY, 39–68.

Faggian, A., McCann, P., and Sheppard, S. (2007) Human Capital, higher education and graduate migration: An analysis of Scottish and welsh students, *Urban Studies*, **44**, 2511–28.

Fournier, A.M., Holford, A.J., Bond, A.L., and Leighton, M. (2019) Unpaid work and access to science professions, *PLoS ONE*, 14.

Henehan, K. (2020) Class of 2020: Education leavers in the current crisis, https://www.resolution foundation.org/app/uploads/2020/05/Class-of-2020.pdf. https://www.resolutionfoundation. org/app/uploads/2017/08/Get-a-move-on.pdf (1 September 2021, date last accessed).

Hoare, A. and Corver, M. (2010) The regional geography of new young graduate labour in the UK, *Regional Studies*, **44**, 477–94.

Kahn, L.B. (2010) The long-term labor market consequences of graduating from college in a bad economy, *Labour Economics*, **17**, 303–16.

Kidd, M.P., O'Leary, N., and Sloane, P. (2017) The impact of mobility on early career earnings: a quantile regression approach for UK graduates, *Economic Modelling*, **62**, 90–201.

Levy, B., Mouw, T., and Daniel Perez, A. (2017) Why did people move during the great recession? The role of economics in migration decision, *The Russell Sage Foundation Journal of the Social Sciences*, **3**, 100–25.

Liu, K., Salvanes, K.G., and Sørensen, E.Ø. (2016) Good skills in bad times: Cyclical skill mismatch and the Long-Term effects of graduating in a recession, *European Economic Review*, **84**, 3–17.

Machin, S., Salvanes, K.G., and Pelkonen, P. (2012) Education and mobility, *Journal of the European Economic Association*, **10**, 417–50.

Meschi, E., Swaffield, J.K., and Vignoles, A. (2011) The relative importance of local labour market conditions and pupil attainment on Post-Compulsory schooling decisions. Institute for the Study of Labor (IZA), IZA Discussion Papers, No. 6143, Bonn, Germany.

Murphy, R., Scott-Clayton, J., and Wyness, G. (2019) The end of free college in eng-land: Implications for quality, enrolments and equity, *Economics of Education Review*, **71**, 7–22.

Oreopoulos, P., von Wachter, T., and Heisz, A. (2012) The short-and long-term career effects of graduating in a recession, *American Economic Journal*, **4**, 1–29.

Oyer, P. (2006) Initial labor market conditions and long-term outcomes for economists, *Journal of Economic Perspectives*, **20**, 143–60.

Saniter, N. and Siedler, T. (2014) Door opener or waste of time? The effects of student internships on labor market outcomes. Institute for the Study of Labor (IZA), IZA Discussion Papers, No. 8141, Bonn, Germany.

Schwandt, H. and Wachter, T.V. (2019) Unlucky cohorts: Estimating the long-term effects of entering the labor market in a recession in large cross-sectional data sets, *Journal of Labor Economics*, **37**, S161–98.

Social Mobility Commission (2017) State of the nation 2017: Social mobility in Great Britain, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/662744/State_of_the_Nation_2017_-_Social_Mobility_in_Great_Britain.pdf. https://www.resolutionfoundation.org/app/uploads/2017/08/Get-a-move-on.pdf (1 September 2021, date last accessed).

Townsend, A. and Champion, T. (2014) The impact of recession on city regions: the British experience, *Local Economy: The Journal of the Local Economy Policy Unit*, **29**, 38–51.

Trimble, L. and Kmec, J. (2011) The role of social networks in getting a job, *Sociology Compass*, **5**, 165–78.

Tumino, A. and Taylor, M.P. (2015) The impact of local labour market conditions on school leaving decisions. Institute for Social and Economic Research, ISER Working Paper Series 2015–14, Colchester, United Kingdom.

UCAS (2021) Where next? What influences the choices school leavers make?, https://www.ucas.com/data-and-analysis/undergraduate-statistics-and-reports/ucas-undergraduate-end-cycle-data-resources-2020/2020-entry-ucas-undergraduate-report-where-next. https://www.resolutionfoundation.org/app/uploads/2017/08/Get-a-move-on.pdf (1 September 2021, date last accessed).

Vignoles, A.F. and Powdthavee, N. (2009) The socioeconomic gap in university dropouts, *The BE Journal of Economic Analysis & Policy*, **9**, 1–36.

Wachter, T.V. and Bender, S. (2006) In the right place at the wrong time: The role of firms and luck in young workers' careers, *American Economic Review*, **96**, 1679–705.