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Employment and Earning Gaps in the Early Career of Ethnic Minority British Graduates: the Importance of University Choice, Parental Background and Area Characteristics

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Abstract

We compare employment and earnings of British graduates belonging to ethnic minorities to those of white British six months and three and a half years after graduation. Six months after graduation all ethnic minority graduates are less likely than whites to be employed but those who have a job earn similarly or more than whites. University choice, parental background and area characteristics account for a large part of the ethnic differences in earnings but do not explain ethnic differences in employment. Three and a half years after graduation the ethnic advantages in earnings disappear while employment penalties reduce. Both employment probability and earnings increase over the career in a similar way for whites and minorities, with only few exceptions.

Keywords: School-to-work transitions; graduates; ethnic gaps; UK; longitudinal analysis
JEL Classification: I24; J15; R23

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1. Introduction

People from ethnic minorities in Britain are on average more likely to have a university degree than white British people (Modood, 2005). It has been suggested that the comparatively higher level of qualifications of ethnic minorities may be the result of strategic choices to signal the quality of the job seeker and to prevent expected ethnic (statistical) discrimination (Colding, Husted, & Hummelgaard, 2009; Heath, Rothon, & Kilpi, 2008; Modood, 2005). However, although having higher qualifications increases the labour market success of ethnic minority workers, it does not eliminate the ethnic penalty altogether. For the UK, Rafferty (2012) shows that ethnic minority graduates are less likely to find employment than white British people, and are more likely to find jobs for which they are overqualified. Battu and Sloane (2004) and Lindley (2009) show that ethnic minority workers, including those born in the UK, are more likely to be over-educated for their job and are paid less than white British for their higher qualifications. There may be various reasons for this.

Studies for the UK have shown that ethnic minority graduates are more likely to come from a lower socio-economic background than white British graduates and are also more likely to graduate from less prestigious universities and to obtain lower grades than white British students with similar qualifications upon entry to university (Modood, 2005; Richardson, 2015).[1] Parents from a higher socio-economic background tend to transmit soft skills to their children (Bowles, Gintis, & Groves, 2005) which are likely to be valued in the labour market but are rarely measured in surveys. In addition, parental background may have an impact on graduates' labour market career through networks. Using contacts is a common and often highly successful method of obtaining a good job, especially for young adults who often rely on their parents' networks (Holzer, 1988; Kadushin, 2012; Patacchini & Zenou, 2012). Since ethnic minority graduates are less likely than white British graduates to be from a high socio-economic background their parents may lack information and resources to help them find a graduate job (Flap & Völker, 2008; Zuccotti, 2015). Being able to fall back on parents with more financial resources may also allow graduates to search for longer and be more selective in accepting employment and (unpaid) internships.

Besides parental background, the local community may also be a source of potentially useful contacts that can help graduates in their job search. Patacchini and Zenou (2011)

[1] Although ethnic minority applicants seem to be less likely to receive an offer or have an offer confirmed from more prestigious universities (Boliver, 2013; Shiner & Modood, 2002), there seems to be no difference by ethnicity in the tendency to apply to more prestigious universities once previous attainment is accounted for (Boliver, 2013; Shiner & Noden, 2015).

suggest that the human capital in the neighbourhood may help parents to improve their children's education and that this can be especially important for parents with fewer resources, while Bayer et al. (2008) show that having neighbours with better socio-economic positions increases labour force participation and earnings. Because of discrimination or because networks are often divided among ethnic lines (Dustmann, 2008; Zuccotti, 2015), ethnic minority and white British parents may have different quality networks, even when they are from the same social class. Ethnic minorities are highly influenced by their community (Dustmann, 2008) and rely more often on social networks to find work than white British do (Battu, Seaman, & Zenou, 2011; Dustmann, Glitz, & Schonberg, 2016). On the other hand, possibly because of such networks, many ethnic minority graduates tend to work close to where they grew up (Abreu, Faggian, & McCann, 2015) and these are often more deprived areas that may offer only few (graduate) employment opportunities (Feng, Flowerdew, & Feng, 2015).

Several qualitative studies have shown how a co-ethnic community can help instil cultural values and the importance of higher education in the younger generation (Shah, Dwyer, & Modood, 2010; Zhou, 2005) while quantitative studies found correlations between the average education in the ethnic community and the education of co-ethnics (Borjas, 1992, 1995; Edin, Fredriksson, & Åslund, 2003; Luthra & Soehl, 2015). The literature has also found that ethnic minorities are more likely to attend worse-quality universities than white British people and obtain lower grades on average. A worse "university career" and qualification may have a negative impact on labour market careers and may help explain ethnic inequalities in the labour market.

This paper contributes to the literature on employment and earning inequalities of ethnic minorities by analysing the early career of graduates who are British nationals. To our knowledge, this is the first paper to focus on ethnic employment and earning gaps among British graduates and in a longitudinal way. By focusing on British nationals we can reduce issues related to language barriers or lack familiarity with UK institutions and labour market that may instead apply to non-nationals. By using the Destination of Leavers of Higher Education (DLHE) we can analyse longitudinally the joint impact of qualifications, parental social class and area characteristics on ethnic penalties in employment and earnings both six months and three and half years after graduation. This allows us to analyse the importance of the socio-economic background, area and university, and how their relevance changes with time spent in the labour market. To the best of our knowledge this is the first paper that accounts for the separate contribution of these factors on transitions to the labour market. In

addition, the DLHE has rarely been used to analyse ethnic differences in labour market outcomes.

We contribute to the academic and policy debate on ethnic inequalities also by analysing how ethnic disadvantage among graduates compares to what we know from the existing literature, which includes workers of all ages and education levels. This allows us to identify to what extent a university degree protects minorities from disadvantage. We also contribute to the discussion on the transmission of disadvantage by analysing the relative importance of parental and area background, whether their impact is mediated by university careers, and how it evolves over people's labour market careers.

In the remainder of this paper we describe the dataset and how we measure parental background, qualifications and area characteristics (Section 2). Section 3 describes the methods and models used and Section 4 discusses the results. Ethnic minority graduates face substantial disadvantage in gaining employment six months after graduation compared to their white colleagues, and this disadvantage persists over their labour market career. Their lower parental background, worse characteristics of the area of origin and worse university career do not explain the penalty. However, for those who are employed there are no earning disadvantages, in contrast to what the literature finds for ethnic minorities of all ages and levels of education. Some earning disadvantage remains among women although this can be explained by ethnic differences in qualifications.

2. Data and descriptive statistics

2.1. The Destination of Leavers of Higher Education (DLHE)

The DLHE is unique in combining administrative and survey data on students graduating from UK universities. The dataset includes administrative data collected when the graduate entered university, such as gender, ethnicity, disability, socio-economic background, area of residence together with data on their university career such as the university attended, the degree studied and the grades obtained. In addition, the data include a census of all graduates, who are surveyed six months after graduation about their labour market status and job characteristics. A subsample of those who graduated in odd years is re-interviewed three years later. As data on parental background is only available from 2005 onwards we use the interviews from 2005 to 2012 (for those graduating in 2004/2005 to 2011/2012) and the three year follow-up surveys (for those graduating in 2004/2005, 2006/2007 and 2008/2009). The follow-up surveys give us information about labour market status and job characteristics in

2008, 2010 and 2012. The second wave therefore refers to labour market outcomes on or after the recession.

We exclude the heterogeneous group of mature students and restrict the sample to graduates younger than 24 (when entering their final year) who have not reported any disability, are British nationals and lived in England before entering university. In line with previous studies, we focus on the largest ethnic minority groups in the UK: Indian, Pakistani, Bangladeshi, black Caribbean, black African and Chinese and compare them to white British. To keep the gender and ethnic gaps separate we compare ethnic minority men to white men and ethnic minority women to white women.

Our dependent variables of interest are employment status (having a job or not) and earnings. Employment is measured by a dummy which is one for those who have a paid job or are self-employed, and zero for those who are unemployed, excluding the inactive from the whole analysis. Yearly earnings, which we deflate to 2011 prices using the Consumer Price Index (CPI) provided by the Office for National Statistics (ONS), are provided for people in paid jobs only (and exclude the self-employed). To eliminate possible outliers and coding errors we exclude graduates in the highest and lowest 1% of observations for earnings. Descriptive statistics of the variables used in our analysis are in Table A1 in the Appendix. The table, which does not separate men and women, shows that the proportion of graduates who have a job six months after graduation varies between 77% for Pakistani and 90% for whites. Six months after graduation there are also differences in yearly earnings. Perhaps surprisingly, most minority groups seem on average to have higher earnings than white British. Three and a half years after graduation differences in the proportions of those who have a job decrease while differences in earnings increase.

2.2. Parental background

We measure parental background by parental social class and the type of high school the graduate attended before university. Parental social class is measured in four categories: managerial and professional occupations (high class); small self-employed, intermediate and lower supervisory and technical occupations (middle class); semi-routine or routine occupations or long-term workless (working class), and self-employment. Self-employment is kept separate because of its relevance among ethnic minority groups (Light, 2005). We use parental class rather than education because education is only measured through a dummy variable from 2008 onwards and because we believe class to be more appropriate: many parents of ethnic minority graduates are first generation migrants and the correlation between

their education and social class is low (Dustmann, 2008). In addition, social class is generally more closely linked to social capital and financial resources than education is (Platt, 2005).

Parental social class may measure skills that parents transmit to their children, as well as networks. To separate that part which may be related to human capital investment we also compute a dummy for having attended a private school before university. Since private schools are usually rather expensive, it is likely that those who attended private schools have more affluent parents and/or parents who highly value education as a mean to succeed in the labour market.

There are clear differences among ethnic groups in parental background in our sample of graduates and in the population in England. The comparison of the class distribution of graduates and of the general population (Table A2 in the Appendix) shows that 59% of white British graduates are from high class background compared to 37% of white British in the population. Consistently with Modood (2005), the difference for ethnic minorities is much lower, especially for Indian, Bangladeshi and Chinese. More than a quarter of ethnic minority graduates come from a working class background, compared to only 14% of white British graduates.

2.3. University

Wages and the probability of finding a job may be higher for those who graduate from more prestigious universities, with higher grades and who studied disciplines more valued in the labour market. Similar to Boliver (2013) we differentiate between graduates from Russell-group universities (the most prestigious, comprising 24 highly ranked research-intensive universities), those from the former polytechnic institutes (the least prestigious), and all others. Like Richardson (2015) we also account for grades obtained: a first-class honour, an upper second-class honour (2:1) or any lower distinction. Finally, we differentiate between nine groups of subjects categorised based on the joint academic coding system following Abreu et al. (2015).[2]

Pakistani, Bangladeshi, black African and black Caribbean students on average graduate from less prestigious universities than whites while Indian and Chinese students graduate from better universities (Appendix, Table A1). In addition 13% of white and Chinese students graduate with first-class honours, but only 5% of black graduates and 7% to

[2] Health sciences (A and B); biological sciences (C and D); physical sciences (F, G, H and J); social sciences (K, L and M); business (N); humanities (Q, R, T and V); creative arts (P and W); education (X); and a combined degree.

9% of those of south-Asian ethnicity do so. Chinese, Indian, Pakistani and Bangladeshi graduates are more likely than white British to study a STEM (Science, Technology, Engineering and Mathematics) subject and black Caribbean and black African graduates are least likely.

2.4. Characteristics of the area of residence before entering university

The DLHE allows us to identify the area where the graduate lived before going to university. To analyse the impact of the characteristics of the area on labour market outcomes of ethnic minorities we need to decide on a geographical aggregation. Most studies on social networks focus on the neighbourhood and use rather small geographical areas. However, to capture labour market opportunities larger areas are likely to be more appropriate. In this paper we include information at the local authority district level[3] as it is the lowest level at which detailed information on ethnicity is available that can be linked to the DLHE.

People coming from more deprived areas may have lower quality networks. As a measure of job opportunities in the labour market we use data on the share of claimants of job-seeker's allowance. These data are available yearly from the Department for Work and Pensions through the ONS.

Diversity in a community may reduce social capital (Schaeffer, 2014; Vervoort, Flap, & Dagevos, 2010) and the use of social networks, for example to find work. In line with the previous literature we use the Herfindhal index as a measure of ethnic diversity in each district. The Herfindahl index is computed as one minus the sum, over ethnic groups, of the square of the proportion of people belonging to that ethnic minority to the overall population (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003). The index can be interpreted as the probability that two persons randomly drawn from the population of that district have the same ethnicity (Vervoort et al., 2010, p. 5). The shares of each ethnic group, which we use to compute the Herfindhal index, are available by district from the 2001 and 2011 censuses. We use linear interpolation to compute the ethnic shares for the intra-census years.

We measure the quality of the network with the local employment rate and with the share of graduates. The employment rate measures job availability and the likelihood that people hear about new jobs, while the share of graduates measures the probability that people hear about graduate jobs. The employment rates and the shares of graduates are available from the 2001 and 2011 censuses and we use linear interpolation for the intra-census years.

[3] Between the 2001 and 2011 censuses some local authority districts have been aggregated; for consistency we use the 2009 administrative boundaries, resulting in 326 districts.

As shown in the Appendix, Table A1, ethnic minority graduates are more likely to come from more diverse and more deprived areas with higher rates of benefit claimants, but also from areas with a slightly higher share of graduates compared to whites.

3. Method and models

3.1. Labour market outcomes six months after graduation

To assess whether differences in parental class, characteristics of the local area and university career account for ethnic differences in employment and earnings six months after graduation we estimate models in which these three factors are added sequentially to analyse the impact that each have on labour market inequalities, as shown in equation (1):

$$Empl_{it} = \alpha_1 + \beta_1 E_i + \delta_{11} Z_{1i} + \delta_{12} Z_{2i} + \delta_{13} Z_{3i} + \varepsilon_{1i} \quad (1)$$
$$Earn_{it} = \alpha_2 + \beta_2 E_i + \delta_{21} Z_{1i} + \delta_{22} Z_{2i} + \delta_{23} Z_{3i} + \delta_{24} Z_{4it} + \varepsilon_{2i}$$

where the dependent variable is either the dummy for employment ($Empl_{it}$) or the log of labour market earnings ($Earn_{it}$) of individual "i" at time "t" (i.e. six months after graduation). The employment models are estimated using binary logistic regressions while the earning models are estimated by OLS regressions. The results of the logistic regression are shown as marginal effects. We use weights provided by the DLHE to account for graduates studying more than one degree. To account for the fact that local area characteristics are the same for people from the same district of origin we cluster the standard errors of all models by the district in which the respondent lived before university. All models are estimated separately for men and women.

E_i consists of dummies for ethnicity and can be interpreted as the ethnic gaps. We start by estimating ethnic gaps from a model which only includes dummies for the year of graduation to control for year-specific characteristics. No additional controls are needed as our graduates are all between 21 and 24 years old and have essentially no work experience as graduates.

Z_{1i}, Z_{2i} and Z_{3i} include the variables identifying parental background, university careers, and the characteristics for the area of origin and therefore do not vary over time. We first include these three sets of variables separately and then include them jointly. If the labour market disadvantage faced by ethnic minority graduates is partly mediated by their parental background, university careers, or the characteristics of the area they come from, we

expect the inclusion of the variables in Z to result in β coefficients which are closer to zero (a coefficient of zero would indicate no ethnic gaps).

Z_{4i} is included only in the earning models to capture job characteristics that may have an impact on earnings. These are: a dummy for working part-time, one for temporary jobs, and a dummy for those who work in London, where minorities concentrate and wages are comparatively high (Dustmann & Theodoropoulos, 2010).

3.2. Labour market outcomes three and a half years after graduation

We could use a model similar to Equation (1) also to analyse ethnic differences in labour market outcomes three and a half years after graduation. However, it is important to note that only a subsample of graduates is interviewed three and a half years after graduation and it is possible that the sample is biased towards those who are more successful in the labour market if those who are less successful are less likely to participate in the survey. As shown in the Appendix (Table A3) graduates who participate in both waves of the survey do not seem to differ much in terms of parental background and area of origin, nor in terms of employment or earnings. There are substantial differences, however, in terms of university career: those who participate in both waves are more likely to have studied a STEM subject, to have graduated with a 2:1 or a first degree and from a Russell group university than those who only participated in the first wave.

As a further test we estimate Equation (1), including all covariates, for employment and earnings six months after graduation on the full sample of all graduates participating in the first wave and on the subsample of those who participate in both waves. The results in the Appendix (Table A4) show that the gaps estimated six months after graduation on the full sample (those who participate at least in the first wave) tend to be higher than those estimated on graduates who participated in both waves (the longitudinal sample). This suggests that those who participated in both waves may not be a random sample, and results need to take this into consideration. The models estimating labour market outcomes three and a half years after graduation include the full set of covariates:

$$Empl_{it+1} = \alpha_3 + \beta_3 E_i + \delta_{31} Z_1 + \delta_{32} Z_2 + \delta_{33} Z_3 + \delta_{35} Z_5 + \varepsilon_{3i} \quad (2)$$

$$Earn_{it+1} = \alpha_4 + \beta_4 E_i + \delta_{41} Z_1 + \delta_{42} Z_2 + \delta_{43} Z_3 + \delta_{44} Z_{4t+1} + \delta_{45} Z_5 + \varepsilon_{4i}$$

where the labour market outcomes in this case refer to time "t+1", i.e. three and a half years after graduation. The explanatory variables are the same as in Equation (1) with the

exception of Z_4, which now refers to the job held at time t+1 rather than the job held at time t. To control for the "initial conditions" we also include dummies for whether the graduate was unemployed, in unpaid work, in further study, or other type of inactivity six months after graduation, with employment and self-employment used as reference category (Z_5).

Once again, employment models are estimated using binary logistic regressions while the earning models are estimated by OLS regressions. Standard errors are clustered by district and the models are estimated separately for men and women.

3.3. Trajectories

While the previous models give us an indication of how employment probability and earnings may vary over time for these cohorts of graduates, the data also allows us to add another layer to the analysis. By exploiting the longitudinal nature of the data we can compare career trajectories of ethnic minorities in terms of employment probability and earning for those graduates who were active in the labour market at both points in time or had a paid job at those points in time (six months and three and a half years after graduation). We do this by estimating models in first differences between t and t+1 ($_t\Delta_{t+1}$):

$$_t\Delta_{t+1}Empl_i = \alpha_5 + \theta_{11}\,{}_t\Delta_{t+1}L_i + \theta_{12}\,{}_t\Delta_{t+1}L_i\,E_i + \varepsilon_{5i} \quad (3)$$

$$_t\Delta_{t+1}Earn_i = \alpha_6 + \theta_{21}\,{}_t\Delta_{t+1}L_i + \theta_{22}\,{}_t\Delta_{t+1}L_i\,E_i + \theta_{23}\,{}_t\Delta_{t+1}\,Z_4 + \varepsilon_{6i}$$

In these models all time-invariant characteristics, both observed, such as parental background, local area and university career, and unobserved, are differenced out. The models only include a dummy variable (L) which is zero in the first wave and one in the second wave. The coefficient of this variable captures changes between t and t+1 in the probability of being employed and in earnings. The interactions between this dummy and the ethnicity dummies measure how the trajectories in the probability of employment and in earning for ethnic minorities differ from those of white graduates.

For simplicity, the employment models are estimated using a linear probability models and contain no other control variables. The earning models are estimated by OLS and also include changes in the characteristics of the job (Z_4) between t and t+1.

4. Results

4.1. Employment gaps six months after graduation

Table 1 shows ethnic differences (gaps) in the probability of being in employment six months after graduation; the top part of the Table refers to men, while the bottom part of the Table refers to women.

The basic model only accounts for the year of graduation and shows that ethnic minority graduates are on average less likely to be employed than white graduates. The employment gaps are generally slightly larger for women than for men although the patterns are the same. The gap is smallest for black Caribbean graduates, who are 3-4 percentage points (p.p.) less likely to be employed than white British, and largest for Pakistani and Bangladeshi graduates and Chinese men who are 10-16 p.p. less likely to be employed. While the existing literature, which includes people of various ages and education levels, normally finds the best labour market outcomes for Indian and Chinese minorities (Blackaby, Leslie, Murphy, & O'Leary, 2005) we find that, compared to their white counterparts, Indian and Chinese graduates experience similar employment gaps as the other minority groups.

The model in Column (2) includes the parental background variables. People from high and middle parental class have a higher probability of being in employment, while those who went to a public – as opposed to private – school are less likely to be in employment.[4] Including controls for parental background in Column (2) does not reduce ethnic disadvantage in employment, suggesting that the fact that ethnic minorities come disproportionately from lower parental background does not explain their employment gaps.

We still find employment gaps in Column (3) where we include the characteristics of the local area, although they are reduced by around 1 to 2p.p. for all ethnic groups bar the Chinese. Graduates who come from an area with more claimants of jobseeker's allowance are less likely to be employed six months after graduation, while those coming from an area with a higher employment rate are more likely to be employed. This suggests that the work opportunities as well as the quality of the local network may be important for young graduates to find work.

In Column (4) we include the university career. Those who graduate from more prestigious universities and with higher grades are more likely to be employed six months

[4] The full set of coefficients are not shown here but available on request. The coefficients for the models including all explanatory variables are in the Appendix, Tables A5 (employment and earning gaps six months after graduation) and A6 (employment and earning gaps three and a half years after graduation).

after graduation, and the subject of study has an impact too. Perhaps surprisingly, this does not seem to explain ethnic minority employment gaps either. Instead, ethnic gaps seem to increase for some groups, thus suggesting that ethnic minority graduates are not rewarded for their degrees the same way as white British are.

The model in Column (5) includes all the covariates. Employment gaps are similar to the models in which only the characteristics of the local area where graduates come from are included. The only exception is the employment gap for black Caribbean men, which is no longer statistically significant. In addition, the various covariates do not seem to influence each other as their coefficients remain largely unchanged when they are all included. This suggests that parental background and local area have a direct impact on employment six months after graduation, and this impact is not mediated by university careers.

TABLE 1 ABOUT HERE

4.2. Earning gaps six months after graduation

Table 2 shows the estimated ethnic gaps for yearly earnings for men (top part of the Table) and women (bottom part of the Table). The basic model in Column (1) shows the average difference in earnings by ethnicity when accounting for year of graduation only. The results suggest that Pakistani and Bangladeshi women and black Caribbean men earn around 3% less than white British graduates on average, but black African, Indian and Chinese graduates earn 4-9% more. This is in contrast with the previous literature on ethnic gaps including workers of all ages and levels of education and showing much larger earning gaps, especially for Pakistani and Bangladeshi men (Longhi & Platt, 2008; Longhi et al. 2013). Although this earning advantage for ethnic minorities may perhaps seem surprising, it may be related to the lower employment probability of ethnic minorities: those who do get a paid job are likely to be a positively selected group in terms of unmeasured characteristics.

The model in Column (2) includes controls for whether respondents work in London, as well as for whether their contract is part-time or temporary. Being employed in "low quality" jobs may itself be due to disadvantage and cannot be considered as an explanation of the earning gaps. In addition, the fact that many ethnic minority graduates in the UK live in London, where wages are higher (Dustmann & Theodoropoulos, 2010) may partly hide earning gaps (Longhi & Brynin, forthcoming). Nevertheless, it is important to analyse how job characteristics and location affect our estimated gaps. After controlling for job characteristics, all differences become either less positive or more negative. The advantages

of Bangladeshi men and black African men and women disappear, while those of Indian and Chinese graduates are substantially reduced. Ethnic minority graduates appear to be more disadvantaged than white British graduates in similar jobs. Only among Pakistani women the penalty disappears when taking work characteristics into account.

When controlling for parental background in Column (3) the earning gaps disappear and the advantages increase. This indicates that the lower average parental background of ethnic minority graduates contributes to their lower earnings compared to white British. While parental background does not seem to explain the worse employment outcomes for ethnic minority graduates it nevertheless explains a part of the earning differences.

When we control for characteristics of the local area in Column (4) we find earning gaps only for Pakistani and Bangladeshi women and black Caribbean men and women, while when controlling for university career in Column (5) only the earning gaps of Pakistani women remain. The final model in Column (6) includes all control variables and shows only minor differences in earnings across ethnic groups. Black Caribbean, Pakistani and Bangladeshi women earn 2-4% less than their white British counterparts, while Indian and Chinese graduates and male Bangladeshi graduates earn 2-5% more than white British graduates.

In summary, for ethnic minority British graduates we find only small earning gaps which are explained by lower parental background and university careers. The average earning gaps for graduates are substantially smaller than the average gap of 7-8% found by Blackaby et al. (2002; 2005) or the 4-9% gap found by Dustmann and Theodoropoulos (2010). So, at least initially in graduates' careers, earning inequalities seem to be minor.

TABLE 2 ABOUT HERE

4.3. Employment and earning gaps three and a half years after graduation

Table 3 shows the estimated employment gaps six months and three and a half years after graduation for the longitudinal subsample (i.e. only those people who participated in both waves); the number of observation differs because the number of people in the labour market – or with a job – increases between waves. This should give us an idea of how employment gaps change over time for this sample of graduates.

As already mentioned in the methods section, labour market penalties six months after graduation estimated on the longitudinal sample are slightly different than the ones estimated on the full sample. Table 3 shows that among men, only Chinese graduates are less likely to

be employed than white British while black Caribbean men are more likely to be employed. Among women we find substantial gaps for Pakistani, followed by Chinese and Indian. Three and a half years after graduation employment gaps tend to decrease compared to six months after graduation. Among men we observe employment gaps only for black African (6 p.p.), while among women we observe pay gaps, ranging from 2 p.p. to 6 p.p., for all groups except Chinese. Hence, differences in employment probability tend to remain stable or decrease over time, with the exception of black African men and women, black Caribbean women and Bangladeshi women, for whom they tend to increase

The activity status six months after graduation has a substantial impact on employment probability three years later, being associated with a 4-6 p.p. lower probability of employment, and is consistent with the literature on the scarring effect of unemployment (Gregg & Tominey, 2005). While the differences are smaller three and a half years than six months after graduation, they do remain, especially for women and indicate long-lasting inequalities in employment among graduates, after controlling for all other factors.

TABLE 3 ABOUT HERE

Table 4 presents earning gaps six months and three and a half after graduation for the longitudinal sample. As with employment, there is a scarring effect of early unemployment on earning. Graduates who were unemployed six months after graduation earn 12-14% less than those who were initially employed, suggesting that ethnic employment gaps six months after graduation can have long-lasting effects.

Although the small number of observations for the longitudinal sample may contribute to the low level of statistical significance, after controlling for early unemployment and background, we find no remaining earning gaps for minority graduates six months after graduation, with the exception of black Caribbean men and Pakistani women. Three and a half years after graduation only black African women seem to experience earning gaps. Hence, also three and a half years after graduation, the main ethnic penalties are in employment rather than in earnings.

TABLE 4 ABOUT HERE

4.4. Trajectories

Differences in the employment and earning trajectories of white British and ethnic minority graduates between six months and three and a half years after graduation are shown in Table 5. The sample for employment includes only those who were in the labour market both six months and three and a half years after graduation, while the sample for earnings includes only those who had a paid job at both points in time. By focusing on the same people, this allows us to study the evolution of employment and earnings by ethnicity over time, although at the price of a much reduced sample size. The figures in Table 5 are estimates of the overall probability of employment and average earnings for each group computed from the interaction effects estimated from equation (3).

TABLE 5 ABOUT HERE

The probability of being in employment grows by around 8p.p. for white women and 12 p.p. for white men and there does not seem to be any statistically significant difference across groups with only few exceptions. There is no change in the employment probability for black African men compared to white British men and for black Caribbean women compared to white British women. Since ethnic minorities have a lower probability of employment compared to white British six months after graduation, a similar or lower growth suggests that inequalities tend to persist – or increase for some groups – over the career. Only Pakistani women experience a statistically significantly larger growth in employment probability than their white counterparts, suggesting catching up.

Earnings increase substantially for white graduates, but significantly less so for Black African women and Pakistani men. While these differences can only be indicative, given the small sample size and the selective subsample used here, they indicate that certain ethnic groups, mainly black Caribbean, black African and to some extent Pakistani graduates, may face difficulties in career progression. The differences we find in early labour market outcomes may persist over time and may be responsible for the lower outcomes of ethnic minority graduates compared to their white counterparts.

4.6. Living in London

It could be argued that the size of the geographical areas we use for our analyses may be inappropriate for London. Because of its size London is divided into over 20 local authority districts, while the districts outside London generally include towns and their surrounding

areas or larger cities. Districts in London are geographically much smaller than in the rest of the country and the ease of transportation means that people are likely to cross district boundaries multiple times a day and are likely to have ties and networks spanning over multiple districts (this is much less likely for the districts outside London). The local unemployment rate or the local deprivation in such tiny geographical areas may not properly represent the opportunities and networks that the graduate has access to. To analyse whether this has an impact on our results we have re-estimated our models after aggregating all London districts into one single (London) area.[5] Hence in this case the characteristics of the area are the same for all graduates who lived any London district before going to university. The values for London are computed as the weighted average of the local authority districts within London by their population in the 2001 census. The estimated ethnic gaps do not change substantially and the fact that in our analysis London is divided into more than 20 districts does not affect our results.

5. Conclusions

Higher education is often seen as a pathway to better outcomes and to social mobility (Lindley, 2009). As a higher proportion of ethnic minorities in the UK gain higher qualifications overall inequalities in labour market outcomes are likely to decrease over time. In this paper we focus on employment and earning gaps among British people of different ethnicity graduating from UK universities.

The literature on ethnic employment and earning penalties includes people of all ages and levels of education and find substantial employment and earning gaps, especially for Bangladeshi and Pakistani men (Longhi & Platt, 2008). In contrast, for British graduates we find that there are employment gaps six months after graduation – smaller than what found in the previous literature – and that those who have a job earn more than their white British counterpart; the only exception are Pakistani and Bangladeshi women, who experience a small (3%) earning gap compared to white women. Neither parental background nor differences in university careers explain ethnic gaps in employment while the characteristics of the area of origin play only a small role. However, differences in earnings seem to be largely explained by differences in university careers, followed by differences in parental

[5] The results are available upon request.

background and in the area of origin, indicating that background remains important even among university graduates.

Employment and earning gaps evolve over time and careers. Employment gaps across groups disappear for most ethnic minority men three and a half years after graduation, with the only exception of black African men. The initial earning advantages disappear. Among women employment gaps remain for most minorities while we find earning gaps only for black African women. For most ethnic minority groups employment and earning trajectories do not seem to differ significantly from those of white British. However, black African men and black Caribbean women's employment trajectories tend to be worse than those of the other groups, suggesting persistent or increasing inequalities. In contrast, Pakistani women seem to catch up with white women over their career. In terms of earnings few groups, black African women and Pakistani men, seem to have worse trajectories than whites.

Overall, ethnic minority women are more at a disadvantage compared to white women than ethnic minority men compared to white men and this difference seems to be larger three and a half years after graduation than it is six months after graduation. Given the possible gender gap, this suggests that ethnic minority women may be at particular disadvantage. Our findings also indicate that university may not always pay off for ethnic minorities as much as it does for whites. This is especially true when it comes to finding work as these penalties do not seem to diminish as career progresses.

Since the main hurdle for ethnic minorities seems to be the lower employment probability and its negative long-term scarring consequences, employability schemes targeted to minorities may help reduce ethnic gaps in the short and longer term.

References

Abreu, M., Faggian, A., & McCann, P. (2015). Migration and inter-industry mobility of UK graduates. *Journal of Economic Geography, 15*(2), 353–385.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, *8*(2), 155–194.

Battu, H., Seaman, P., & Zenou, Y. (2011). Job contact networks and the ethnic minorities. *Labour Economics, 18*(1), 48–56.

Battu, H., & Sloane, P. J. (2004). Over-education and ethnic minorities in Britain. *The Manchester School, 72*(4), 535–559.

Bayer, P., Ross, S. L., & Topa, G. (2008). Place of work and place of residence: informal hiring networks and labor market outcomes. *Journal of Political Economy, 116*(6),

Blackaby, D. H., Leslie, D. G., Murphy, P. D., & O'Leary, N. C. (2002). White/ethnic minority earnings and employment differentials in Britain: evidence from the LFS. *Oxford Economic Papers*, *54*(2), 270–297.

Blackaby, D. H., Leslie, D. G., Murphy, P. D., & O'Leary, N. C. (2005). Born in Britain: how are native ethnic minorities faring in the British labour market? *Economics Letters*, *88*(3), 370–375.

Boliver, V. (2013). How fair is access to more prestigious UK universities? *The British Journal of Sociology*, *64*(2), 344–364.

Borjas, G. J. (1992). Ethnic capital and intergenerational mobility. *Quarterly Journal of Economics*, *107*(1), 123–150.

Borjas, G. J. (1995). Ethnicity, neighborhoods, and human-capital externalities. *The American Economic Review*, *85*(3), 365–390.

Bowles, S., Gintis, H., & Groves, M. O. (2005). Introduction. In S. Bowles, H. Gintis, & M. O. Groves (Eds.), *Unequal Chances: family background and economic success* (pp. 1–22). New York, Princeton and Oxford: Russell sage foundation and Princeton University Press.

Colding, B., Husted, L., & Hummelgaard, H. (2009). Educational progression of second-generation immigrants and immigrant children. *Economics of Education Review*, *28*(4), 434–443.

Dustmann, C. (2008). Return migration, investment in children, and intergenerational mobility comparing sons of foreign- and native-born fathers. *Journal of Human Resources*, *43*(2), 299–324

Dustmann, C., Glitz, A., & Schonberg, U. (2016). Referral-based job search networks. *The Review of Economic Studies*, *83*(2), 514–546.

Dustmann, C., & Theodoropoulos, N. (2010). Ethnic minority immigrants and their children in Britain. *Oxford Economic Papers*, *62*(2), 209–233.

Edin, P.-A., Fredriksson, P., & Åslund, O. (2003). Ethnic enclaves and the economic success of immigrants: evidence from a natural experiment. *The Quarterly Journal of Economics*, *118*(1), 329–357.

Feng, X., Flowerdew, R., & Feng, Z. (2015). Does neighbourhood influence ethnic inequalities in economic activity? Findings from the ONS Longitudinal Study. *Journal of Economic Geography*, *15*(1), 169–194.

Flap, H., & Völker, B. (2008). Social, cultural, and economic capital and job attainment: the position generator as a measure of cultural and economic resources. In N. Lin & B. H. Erickson (Eds.), *Social Capital: An International Research Program* (pp. 65–80). Oxford University Press.

Gregg, P., & Tominey, E. (2005). The wage scar from male youth unemployment. *Labour Economics*, *12*(4), 487–509.

Heath, A. F., Rothon, C., & Kilpi, E. (2008). The second generation in western Europe: education, unemployment, and occupational attainment. *Annual Review of Sociology*, *34*, 211–235.

Holzer, H. J. (1988). Search method used by unemployed youth. *Journal of Labor Economics*, *6*(1), 1–20.

Kadushin, C. (2012). *Understanding social networks*. Oxford University Press.

Lessard-Phillips, L., Swain, D., Pampaka, M., & Nwabuzo, O. (2015). *When education isn't enough: labour market outcomes of ethnic minority graduates at elite universities* (Runnymede report). London: Runnymede Trust.

Light, I. (2005). The ethnic economy. In N. J. Smelser & R. Swedberg (Eds.), *The Handbook of Economic Sociology* (2nd ed., pp. 650–677). Oxford: Princeton University Press.

Lindley, J. (2009). The over-education of UK immigrants and minority ethnic groups: evidence from the Labour Force Survey. *Economics of Education Review*, *28*(1), 80–89.

Longhi, S., & Brynin, M. (forthcoming). *Causes of ethnic pay gaps* (Research Report). Manchester, UK: Equality and Human Rights Commission.

Longhi, S., & Platt, L. (2008). *Pay gaps across equalities areas* (Research Report No. 9) (p. 139). Manchester, UK: Equality and Human Rights Commission.

Longhi, S., Nicoletti, C. and Platt, L. (2013) Explained and Unexplained Wage Gaps across the Main Ethno-Religious Groups in Great Britain. *Oxford Economic Papers* 65(2): 471-493.

Luthra, R. R., & Soehl, T. (2015). From parent to child? Transmission of educational attainment within immigrant families: methodological considerations. *Demography*, *52*(2), 543–567.

Modood, T. (2005). The educational attainments of ethnic minorities in Britain. In G. C. Loury, T. Modood, & S. M. Teles (Eds.), *Ethnicity, Social Mobility and Public Policy* (1st ed., pp. 288–308). Cambridge, UK: Cambridge University Press.

Patacchini, E., & Zenou, Y. (2011). Neighborhood effects and parental involvement in the intergenerational transmission of education. *Journal of Regional Science*, *51*(5), 987–1013.

Patacchini, E., & Zenou, Y. (2012). Ethnic networks and employment outcomes. *Regional Science and Urban Economics*, *42*(6), 938–949.

Platt, L. (2005). *Migration and social mobility: the life chances of Britain's minority ethnic communities* (1st ed.). Bristol, UK: The Policy Press, for the Joseph Rowntree Foundation.

Rafferty, A. (2012). Ethnic penalties in graduate level over-education, unemployment and wages: evidence from Britain. *Work, Employment & Society*, *26*(6), 987–1006.

Richardson, J. T. E. (2015). The under-attainment of ethnic minority students in UK higher education: what we know and what we don't know. *Journal of Further and Higher Education*, *39*(2), 278–291.

Schaeffer, M. (2014). *Ethnic diversity and social cohesion* (1st ed.). Surrey, England: Ashgate Publishing Limited.

Shah, B., Dwyer, C., & Modood, T. (2010). Explaining educational achievement and career aspirations among young British Pakistanis: mobilizing "ethnic capital"? *Sociology*, *44*(6), 1109–1127.

Shiner, M., & Modood, T. (2002). Help or hindrance? Higher education and the route to ethnic equality. *British Journal of Sociology of Education*, *23*(2), 209–232.

Shiner, M., & Noden, P. (2015). "Why are you applying there?": "race", class and the construction of higher education "choice" in the United Kingdom. *British Journal of Sociology of Education*, *36*(8), 1170–1191.

Vervoort, M., Flap, H., & Dagevos, J. (2010). The ethnic composition of the neighbourhood and ethnic minorities' social contacts: three unresolved issues. *European Sociological Review*, 897–915.

Zhou, M. (2005). Ethnicity as social capital: community-based institutions and embedded networks of social relations. In G. C. Loury, T. Modood, & S. M. Teles (Eds.), *Ethnicity, Social Mobility and Public Policy* (1st ed., pp. 131–159). Cambridge, UK: Cambridge University Press.

Zuccotti, C. V. (2015). Do parents matter? Revisiting ethnic penalties in occupation among second generation ethnic minorities in England and Wales. *Sociology*, *49*(2), 229–251.

Tables

Table 1: Employment probability six months after graduation

Men Obs. = 196,976	(1) Basic model	(2) Parental background	(3) Local area	(4) University	(5) Full model
Ethnicity (ref. white British)					
Black Caribbean	-0.034**	-0.033**	-0.020*	-0.027**	-0.016+
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Black African	-0.072**	-0.071**	-0.057**	-0.073**	-0.061**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Indian	-0.066**	-0.063**	-0.054**	-0.074**	-0.060**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Pakistani	-0.109**	-0.103**	-0.093**	-0.117**	-0.098**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Bangladeshi	-0.107**	-0.098**	-0.091**	-0.113**	-0.093**
	(0.015)	(0.015)	(0.014)	(0.015)	(0.014)
Chinese	-0.128**	-0.121**	-0.122**	-0.126**	-0.115**
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Women Obs. = 258,166					
Ethnicity (ref. white British)					
Black Caribbean	-0.037**	-0.038**	-0.028**	-0.032**	-0.027**
	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)
Black African	-0.084**	-0.085**	-0.070**	-0.082**	-0.074**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Indian	-0.076**	-0.076**	-0.071**	-0.082**	-0.077**
	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Pakistani	-0.156**	-0.155**	-0.148**	-0.165**	-0.156**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Bangladeshi	-0.128**	-0.127**	-0.116**	-0.134**	-0.123**
	(0.014)	(0.014)	(0.013)	(0.014)	(0.014)
Chinese	-0.099**	-0.095**	-0.094**	-0.095**	-0.089**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)

Marginal effects of binary logistic regressions, standard errors are clustered by local authority of origin. Other explanatory variables: dummies for year of graduation and for disability. Parental background: dummies for parental social class and for having attended private school before university. Local area: ethnic dissimilarity index (Herfindhal), proportion of co-ethnics, proportion of claimants, employment rate, employment rate of co-ethnics, share of graduates, ratio of co-ethnic graduates. University: dummies for Russell group and former polytechnic, dummies for grades and for subject studied.
+: p<0.1; *: p<0.05; **: p<0.01

Table 2: Earnings six months after graduation

Men Obs. = 75,831	(1) Basic model	(2) Job type	(3) Parental background	(4) Local area	(5) University	(6) Full model
Ethnicity (ref. white British)						
Black Caribbean	-0.026+	-0.053**	-0.013	-0.048**	0.030*	-0.001
	(0.015)	(0.011)	(0.014)	(0.012)	(0.014)	(0.010)
Black African	0.042**	-0.007	0.052**	0.016	0.064**	0.015
	(0.013)	(0.013)	(0.013)	(0.014)	(0.012)	(0.012)
Indian	0.079**	0.056**	0.089**	0.069**	0.065**	0.048**
	(0.014)	(0.009)	(0.012)	(0.010)	(0.012)	(0.007)
Pakistani	-0.008	-0.000	0.012	-0.004	-0.007	0.009
	(0.015)	(0.009)	(0.014)	(0.012)	(0.015)	(0.009)
Bangladeshi	0.034+	0.009	0.065**	0.030+	0.042*	0.033*
	(0.019)	(0.016)	(0.019)	(0.018)	(0.019)	(0.016)
Chinese	0.092**	0.061**	0.097**	0.084**	0.041**	0.021+
	(0.015)	(0.013)	(0.015)	(0.015)	(0.014)	(0.012)
Women Obs. = 112,033						
Ethnicity (ref. white British)						
Black Caribbean	0.006	-0.041**	0.015	-0.029**	0.040**	-0.021*
	(0.012)	(0.011)	(0.012)	(0.010)	(0.013)	(0.010)
Black African	0.071**	-0.001	0.078**	0.031**	0.081**	-0.004
	(0.010)	(0.009)	(0.010)	(0.012)	(0.008)	(0.008)
Indian	0.049**	0.032**	0.056**	0.027**	0.038**	0.014*
	(0.014)	(0.009)	(0.013)	(0.009)	(0.013)	(0.006)
Pakistani	-0.035*	-0.010	-0.021	-0.042**	-0.045**	-0.022*
	(0.016)	(0.011)	(0.016)	(0.012)	(0.016)	(0.011)
Bangladeshi	-0.033+	-0.047**	-0.013	-0.050**	-0.029+	-0.044**
	(0.017)	(0.015)	(0.017)	(0.014)	(0.017)	(0.015)
Chinese	0.088**	0.046**	0.095**	0.072**	0.064**	0.029**
	(0.013)	(0.011)	(0.012)	(0.012)	(0.012)	(0.010)

Standard errors are clustered by local authority of origin. Other explanatory variables: dummies for year of graduation, disability and for working in London. Job Type: dummy for working part-time, for temporary jobs, and for working in London. Parental background: dummies for parental social class and for having attended private school before university. Local area: ethnic dissimilarity index (Herfindhal), proportion of co-ethnics, proportion of claimants, employment rate, employment rate of co-ethnics, share of graduates, ratio of co-ethnic graduates. University: dummies for Russell group and former polytechnic, dummies for grades and for subject studied.

+: $p<0.1$; *: $p<0.05$; **: $p<0.01$

Table 3: Employment probability longitudinal sample

	(1)	(2)	(1)	(2)
	Men	Men	Women	Women
Full model	Six months	Three and a half years	Six months	Three and a half years
Ethnicity (ref. white British)				
Black Caribbean	0.087**	0.025**	0.011	-0.031+
	(0.026)	(0.009)	(0.023)	(0.017)
Black African	0.045	-0.063*	-0.059	-0.039*
	(0.031)	(0.029)	(0.036)	(0.019)
Indian	-0.018	-0.010	-0.065**	-0.023*
	(0.019)	(0.009)	(0.019)	(0.009)
Pakistani	-0.030	-0.027	-0.224**	-0.064**
	(0.040)	(0.018)	(0.043)	(0.020)
Bangladeshi	0.018	-0.011	-0.036	-0.050+
	(0.050)	(0.026)	(0.051)	(0.029)
Chinese	-0.073+	-0.014	-0.090*	-0.039
	(0.044)	(0.019)	(0.042)	(0.025)
Observations	8,305	10,592	11,327	14,248

Marginal effects of binary logistic regressions, standard errors are clustered by local authority of origin. Other explanatory variables: dummies for year of graduation, dummies for parental social class and for having attended private school before university, ethnic dissimilarity index (Herfindhal), proportion of co-ethnics, proportion of claimants, employment rate, employment rate of co-ethnics, share of graduates, ratio of co-ethnic graduates, dummies for Russell group and former polytechnic, dummies for grades, subject studied, and activity status six months after graduation (for models three and a half years).
+: p<0.1; *: p<0.05; **: p<0.01

Table 4: Earnings longitudinal sample

	(1)	(2)	(1)	(2)
	Men	Men	Women	Women
Full model	Six months	Three and a half years	Six months	Three and a half years
Ethnicity (ref. white British)				
Black Caribbean	-0.142*	-0.048	-0.014	-0.037
	(0.062)	(0.051)	(0.032)	(0.029)
Black African	0.049	-0.054	-0.018	-0.087**
	(0.042)	(0.050)	(0.048)	(0.032)
Indian	0.034	0.036+	-0.007	0.001
	(0.032)	(0.021)	(0.022)	(0.024)
Pakistani	-0.001	0.005	-0.078+	-0.039
	(0.039)	(0.041)	(0.044)	(0.031)
Bangladeshi	0.074	0.035	0.057	-0.047
	(0.070)	(0.097)	(0.061)	(0.052)
Chinese	-0.064	0.003	0.075*	-0.014
	(0.060)	(0.045)	(0.033)	(0.033)
Observations	3,566	8,011	5,454	11,480

Marginal effects of binary logistic regressions, standard errors are clustered by local authority of origin. Other explanatory variables: dummies for year of graduation, dummies for parental social class and for having attended private school before university, ethnic dissimilarity index (Herfindhal), proportion of co-ethnics, proportion of claimants, employment rate, employment rate of co-ethnics, share of graduates, ratio of co-ethnic graduates, dummies for Russell group and former polytechnic, dummies for grades, subject studied, dummy for working part-time, for temporary jobs, for working in London, and activity status six months after graduation (for models three and a half years).

+: $p<0.1$; *: $p<0.05$; **: $p<0.01$

Table 5: Labour market trajectories

	Men		Women	
Average change	Employment	Earning	Employment	Earning
White British	0.120**	0.426**	0.076**	0.410**
	(0.005)	(0.007)	(0.003)	(0.007)
Black Caribbean	0.068	0.428**	0.017	0.342**
	(0.045)	(0.067)	(0.024)	(0.060)
Black African	0.014	0.342**	0.118**	0.257**
	(0.045)	(0.081)	(0.026)	(0.064)
Indian	0.140**	0.436**	0.101**	0.453**
	(0.020)	(0.038)	(0.015)	(0.034)
Pakistani	0.109**	0.317**	0.201**	0.330**
	(0.035)	(0.054)	(0.028)	(0.071)
Bangladeshi	0.135*	0.615**	0.040**	0.516**
	(0.063)	(0.101)	(0.046)	(0.126)
Chinese	0.149**	0.450**	0.070*	0.364**
	(0.041)	(0.071)	(0.035)	(0.089)

First difference model of employment and earnings. Other explanatory variables: changes in part-time, temporary or work in London for earnings. The employment sample for men consists of 13,318 white, 146 black Caribbean, 146 black African, 756 Indian, 238 Pakistani, 74 Bangladeshi and 174 Chinese. The employment sample for women consists of 17,160 white, 354 black Caribbean, 306 black African, 888 Indian, 268 Pakistani, 100 Bangladeshi and 172 Chinese. The earning sample for men consists of 5,482 white, 52 black Caribbean, 40 black African, 178 Indian, 84 Pakistani, 24 Bangladeshi, 60 Chinese. The earning sample for women consists of 8,164 white, 98 black Caribbean, 94 black African, 314 Indian, 68 Pakistani, 20 Bangladeshi and 54 Chinese.
+: $p<0.1$; *: $p<0.05$; **: $p<0.01$,

Appendix

Table A1: Mean (standard error) by ethnicity for all variables (2002-2011)

	White British	Black Caribbean	Black African	Indian	Pakistani	Bangladeshi	Chinese
Men	0.43	0.34	0.38	0.47	0.47	0.45	0.49
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Private school	0.11	0.04	0.06	0.11	0.06	0.04	0.17
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Parental background							
Working class	0.15	0.22	0.25	0.30	0.31	0.51	0.43
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Self-employed	0.07	0.04	0.03	0.10	0.24	0.22	0.15
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Intermediate	0.20	0.26	0.18	0.22	0.15	0.08	0.11
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
High	0.59	0.48	0.54	0.38	0.30	0.20	0.31
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Herfindahl index	0.18	0.54	0.53	0.49	0.44	0.44	0.31
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Share of co-ethnics (%)	0.00	4.86	7.46	11.15	7.56	4.19	0.91
	(0.00)	(0.05)	(0.07)	(0.06)	(0.07)	(0.16)	(0.01)
Share claimants (%)	2.71	4.04	3.82	3.52	3.85	3.77	3.00
	(0.00)	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.02)
Employment rate	74.85	70.02	70.87	70.56	69.52	69.45	73.08
	(0.01)	(0.08)	(0.08)	(0.04)	(0.07)	(0.13)	(0.09)
Employment rate co-ethnics	0.00	68.50	59.31	74.88	49.22	49.28	59.96
	(0.00)	(0.08)	(0.10)	(0.05)	(0.08)	(0.17)	(0.21)
Share graduates (%)	24.88	30.00	32.88	26.19	24.85	28.67	27.37
	(0.01)	(0.14)	(0.13)	(0.05)	(0.09)	(0.20)	(0.14)
Ratio co-ethnic graduates	1.00	0.89	1.34	1.43	0.94	0.73	1.49
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Grades							
At most lower second class honours	0.31	0.52	0.51	0.45	0.52	0.48	0.36
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Upper second-class honours	0.56	0.42	0.44	0.46	0.41	0.44	0.51
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)

	First-class honours	0.13	0.05	0.06	0.09	0.07	0.08	0.14
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
University								
	Mid-group university	0.35	0.40	0.42	0.29	0.33	0.29	0.25
		(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
	Former polytechnic	0.34	0.50	0.40	0.46	0.50	0.56	0.31
		(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
	Russell group	0.30	0.10	0.18	0.26	0.17	0.14	0.44
		(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Subject studied								
	Health	0.05	0.04	0.08	0.11	0.12	0.08	0.07
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
	Biology	0.12	0.13	0.10	0.08	0.10	0.10	0.09
		(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
	Physical sciences	0.16	0.11	0.14	0.21	0.20	0.19	0.29
		(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
	Social sciences	0.15	0.19	0.25	0.20	0.21	0.23	0.16
		(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
	Business	0.12	0.17	0.21	0.24	0.23	0.24	0.20
		(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
	Humanities	0.16	0.09	0.06	0.05	0.06	0.06	0.06
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
	Arts	0.18	0.23	0.14	0.08	0.05	0.06	0.13
		(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
	Education	0.06	0.03	0.01	0.02	0.03	0.03	0.01
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
	Combined subject	0.00	0.00	0.00	0.00	0.00	0.01	0.00
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Outcomes six months after graduation								
	Employed	0.90	0.87	0.82	0.83	0.77	0.79	0.79
		(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
	Yearly earnings	16,764.35	16,633.90	18,121.25	18,114.32	16,708.31	17,019.06	18,650.42
		(12.49)	(125.69)	(129.25)	(66.23)	(108.17)	(185.94)	(175.66)
	Temporary job	0.32	0.28	0.31	0.33	0.34	0.32	0.34
		(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)

Part-time work	0.17	0.31	0.25	0.20	0.26	0.32	0.20
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)
Work in London	0.15	0.41	0.50	0.27	0.16	0.31	0.30
	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)
Outcomes three and a half years after graduation							
Employed	0.97	0.96	0.92	0.95	0.90	0.92	0.94
	(0.00)	(0.01)	(0.02)	(0.01)	(0.02)	(0.03)	(0.02)
Yearly earnings	25,832	21,088	22,888	27,702	24,182	28,191	26,910
	(238)	(586)	(744)	(1,030)	(1,302)	(5,695)	(1,252)
Temporary job	0.05	0.11	0.06	0.06	0.10	0.07	0.02
	(0.00)	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)	(0.01)
Part-time work	0.16	0.16	0.23	0.15	0.17	0.09	0.20
	(0.00)	(0.02)	(0.03)	(0.01)	(0.03)	(0.03)	(0.03)
Work in London	0.25	0.61	0.77	0.45	0.26	0.45	0.52
	(0.00)	(0.03)	(0.03)	(0.02)	(0.03)	(0.05)	(0.04)
Observations	410,693	4,402	4,672	21,724	7,346	2,332	3,973

Table A2: Parental background among graduates (DLHE) and in the population (census)

		White British	Black Caribbean	Black African	Indian	Pakistani	Bangladeshi	Chinese
Working class	Graduates	0.14	0.23	0.25	0.30	0.31	0.51	0.43
	Population	0.31	0.37	0.43	0.36	0.60	0.67	0.30
Self-employed	Graduates	0.07	0.04	0.03	0.10	0.24	0.21	0.15
	Population	0.09	0.05	0.04	0.10	0.11	0.07	0.19
Middle class	Graduates	0.20	0.25	0.18	0.22	0.15	0.08	0.11
	Population	0.22	0.25	0.18	0.18	0.12	0.13	0.14
High class	Graduates	0.59	0.48	0.53	0.38	0.30	0.20	0.31
	Population	0.37	0.33	0.35	0.35	0.18	0.14	0.38
Private school	Graduates	0.12	0.03	0.06	0.11	0.06	0.04	0.17
Observations	Graduates	451,458	4,862	5,048	22,772	7,693	2,436	4,117

Figures for graduates are computed from the 2005-2012 DLHE; figures for the population are computed using the 2001 census for England

Table A3: Balance between respondents to one or both waves in wave 1

	Participating in wave 1	Participating in wave 1 and wave 2	difference	s.e. difference	p-value
Employed	0.894	0.873	-0.020	0.002	0.000
Log of earnings	9.681	9.641	-0.040	0.003	0.000
Earnings	£16,843	£16,162	-681	57	0.000
Part-time job	0.171	0.137	-0.034	0.003	0.000
Temporary contract	0.325	0.351	0.026	0.004	0.000
Works in London	0.165	0.167	0.002	0.003	0.486
High parental social class	0.567	0.592	0.025	0.004	0.000
Public school	0.112	0.122	0.010	0.002	0.000
Local share claimants	2.797	2.596	-0.202	0.011	0.000
Local ethnic diversity	0.211	0.213	0.001	0.001	0.350
Local share graduates	25.111	23.653	-1.457	0.054	0.000
Local employment rate	74.429	74.004	-0.425	0.042	0.000
STEM-subject	0.357	0.416	0.060	0.003	0.000
Graduate with first	0.130	0.157	0.027	0.002	0.000
Attend Russell-group	0.297	0.368	0.072	0.003	0.000

Table A4: Ethnic gaps six months after graduation for full and longitudinal samples

Men	Employment probability		Yearly earnings	
	Full sample	Longitudinal sample	Full sample	Longitudinal sample
Black Caribbean	-0.016+	0.087**	-0.001	-0.142*
	(0.008)	(0.026)	(0.010)	(0.062)
Black African	-0.061**	0.045	0.015	0.049
	(0.010)	(0.031)	(0.012)	(0.042)
Indian	-0.060**	-0.018	0.048**	0.034
	(0.005)	(0.019)	(0.007)	(0.032)
Pakistani	-0.098**	-0.030	0.009	-0.001
	(0.009)	(0.040)	(0.009)	(0.039)
Bangladeshi	-0.093**	0.018	0.033*	0.074
	(0.014)	(0.050)	(0.016)	(0.070)
Chinese	-0.115**	-0.073+	0.021+	-0.064
	(0.011)	(0.044)	(0.012)	(0.060)
Observations	188,671	8,305	72,265	3,566
Women				
Black Caribbean	-0.027**	0.011	-0.021*	-0.014
	(0.006)	(0.023)	(0.010)	(0.032)
Black African	-0.074**	-0.059	-0.004	-0.018
	(0.007)	(0.036)	(0.008)	(0.048)
Indian	-0.077**	-0.065**	0.014*	-0.007
	(0.005)	(0.019)	(0.006)	(0.022)
Pakistani	-0.156**	-0.224**	-0.022*	-0.078+
	(0.009)	(0.043)	(0.011)	(0.044)
Bangladeshi	-0.123**	-0.036	-0.044**	0.057
	(0.014)	(0.051)	(0.015)	(0.061)
Chinese	-0.089**	-0.090*	0.029**	0.075*
	(0.009)	(0.042)	(0.010)	(0.033)
Observations	246,839	11,327	106,579	5,454

Marginal effects of binary logistic regressions for employment, and coefficients of an OLS model for earnings. Standard errors are clustered by local authority of origin. Other explanatory variables: dummies for year of graduation, dummies for parental social class and for having attended private school before university, ethnic dissimilarity index (Herfindhal), proportion of co-ethnics, proportion of claimants, employment rate, employment rate of co-ethnics, share of graduates, ratio of co-ethnic graduates, dummies for Russell group and former polytechnic, dummies for grades, subject studied, and (for earnings) dummy for working part-time, for temporary jobs, and for working in London.
+: p<0.1; *: p<0.05; **: p<0.01

Table A5: Employment and earnings six months after graduation

	Men		Women	
	Employment	Earning	Employment	Earning
Ethnicity (ref. white British)				
Black Caribbean	-0.016+	-0.001	-0.027**	-0.021*
	(0.008)	(0.010)	(0.006)	(0.010)
Black African	-0.061**	0.015	-0.074**	-0.004
	(0.010)	(0.012)	(0.007)	(0.008)
Indian	-0.060**	0.048**	-0.077**	0.014*
	(0.005)	(0.007)	(0.005)	(0.006)
Pakistani	-0.098**	0.009	-0.156**	-0.022*
	(0.009)	(0.009)	(0.009)	(0.011)
Bangladeshi	-0.093**	0.033*	-0.123**	-0.044**
	(0.014)	(0.016)	(0.014)	(0.015)
Chinese	-0.115**	0.021+	-0.089**	0.029**
	(0.011)	(0.012)	(0.009)	(0.010)
Parental class (ref. working class)				
Self-employed	-0.001	0.002	-0.003	0.008*
	(0.004)	(0.005)	(0.003)	(0.003)
Middle class	0.006*	0.012**	0.003	0.014**
	(0.003)	(0.003)	(0.002)	(0.003)
High class	0.011**	0.022**	0.003*	0.021**
	(0.002)	(0.003)	(0.002)	(0.002)
Private school	-0.001	0.057**	-0.012**	0.037**
	(0.002)	(0.004)	(0.002)	(0.003)
Claimant rate	-0.004**	-0.001	-0.004**	-0.000
	(0.001)	(0.003)	(0.001)	(0.002)
Herfindahl index of diversity	-0.011	0.030*	0.004	0.042**
	(0.008)	(0.012)	(0.005)	(0.014)
Share of graduates	-0.000	0.000	-0.000**	0.001
	(0.000)	(0.000)	(0.000)	(0.000)
Employment rate	0.000	0.003**	0.000	0.002**
	(0.000)	(0.001)	(0.000)	(0.000)
Study subject (ref. health sciences)				
Biological sciences	-0.040**	-0.127**	-0.042**	-0.222**
	(0.005)	(0.007)	(0.002)	(0.004)
Physical sciences	-0.062**	0.041**	-0.046**	-0.092**
	(0.004)	(0.006)	(0.002)	(0.004)
Social sciences	-0.045**	-0.048**	-0.035**	-0.161**
	(0.004)	(0.007)	(0.002)	(0.004)
Business	-0.027**	-0.014*	-0.027**	-0.126**
	(0.005)	(0.007)	(0.002)	(0.004)
Humanities	-0.079**	-0.165**	-0.055**	-0.220**
	(0.005)	(0.007)	(0.002)	(0.004)
Creative arts	-0.079**	-0.175**	-0.056**	-0.262**
	(0.005)	(0.007)	(0.002)	(0.004)
Education	0.023**	0.041**	0.004+	0.016**
	(0.006)	(0.010)	(0.002)	(0.005)
Combined degree	-0.056**	-0.115**	-0.033**	-0.215**
	(0.015)	(0.019)	(0.007)	(0.013)
Grades (ref. at most lower second-class)				
Upper second-class honours	0.033**	0.062**	0.018**	0.039**
	(0.002)	(0.002)	(0.001)	(0.002)
First-class honours	0.065**	0.148**	0.025**	0.098**

	(0.003)	(0.003)	(0.002)	(0.003)
University attended (ref. other old)				
Former polytechnic	-0.010**	-0.037**	-0.002+	-0.016**
	(0.002)	(0.003)	(0.001)	(0.002)
Russell group	-0.023**	0.042**	-0.013**	0.013**
	(0.002)	(0.003)	(0.002)	(0.003)
Year of graduation (ref. 2005)				
2006	0.006	0.080**	0.006*	0.071**
	(0.004)	(0.005)	(0.003)	(0.004)
2007	0.021**	0.145**	0.007**	0.130**
	(0.004)	(0.005)	(0.003)	(0.004)
2008	-0.031**	0.198**	-0.022**	0.186**
	(0.005)	(0.006)	(0.003)	(0.005)
2009	-0.053**	0.194**	-0.030**	0.188**
	(0.005)	(0.008)	(0.004)	(0.007)
2010	-0.029**	0.228**	-0.021**	0.220**
	(0.005)	(0.007)	(0.003)	(0.006)
2011	-0.033**	0.286**	-0.020**	0.268**
	(0.005)	(0.008)	(0.004)	(0.007)
2012	-0.013*	0.334**	-0.009**	0.310**
	(0.005)	(0.009)	(0.003)	(0.007)
Part-time		-0.299**		-0.249**
		(0.005)		(0.004)
Temporary contract		-0.096**		-0.048**
		(0.003)		(0.002)
Work in London		0.197**		0.198**
		(0.005)		(0.005)
Observations	196,976	75,831	258,166	112,033

+: p<0.1; *: p<0.05; **: p<0.01, standard errors are clustered by local authority of origin. Coefficients for employment are marginal effects at grand margin.

Table A6*:* Employment and earnings three and a half years after graduation

	Men		Women	
	Employment	Earning	Employment	Earning
Ethnicity (ref. white British)				
Black Caribbean	0.025**	-0.048	-0.031+	-0.037
	(0.009)	(0.051)	(0.017)	(0.029)
Black African	-0.063*	-0.054	-0.039*	-0.087**
	(0.029)	(0.050)	(0.019)	(0.032)
Indian	-0.010	0.036+	-0.023*	0.001
	(0.009)	(0.021)	(0.009)	(0.024)
Pakistani	-0.027	0.005	-0.064**	-0.039
	(0.018)	(0.041)	(0.020)	(0.031)
Bangladeshi	-0.011	0.035	-0.050+	-0.047
	(0.026)	(0.097)	(0.029)	(0.052)
Chinese	-0.014	0.003	-0.039	-0.014
	(0.019)	(0.045)	(0.025)	(0.033)
Parental class (ref. working class)				
Self-employed	-0.014	-0.016	-0.009	0.023
	(0.009)	(0.022)	(0.007)	(0.018)
Middle class	-0.001	0.027	-0.002	0.029+
	(0.007)	(0.018)	(0.005)	(0.015)
High class	0.006	0.026+	-0.003	0.040**
	(0.005)	(0.015)	(0.004)	(0.013)
Private school	0.002	0.050**	0.004	0.051**
	(0.006)	(0.013)	(0.005)	(0.012)
Claimant rate	0.003	-0.008	0.002	-0.003
	(0.004)	(0.008)	(0.002)	(0.008)
Herfindahl index of diversity	-0.032**	0.020	0.009	0.045
	(0.012)	(0.031)	(0.009)	(0.028)
Share of graduates	0.001*	-0.000	-0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.001)
Employment rate	-0.000	0.004*	0.001*	0.003+
	(0.001)	(0.002)	(0.000)	(0.001)
Study subject (ref. health sciences)				
Biological sciences	-0.022*	-0.198**	-0.009	-0.164**
	(0.011)	(0.033)	(0.006)	(0.020)
Physical sciences	-0.013	-0.051+	-0.011+	-0.071**
	(0.009)	(0.027)	(0.006)	(0.018)
Social sciences	-0.020*	-0.098**	-0.005	-0.115**
	(0.010)	(0.030)	(0.006)	(0.018)
Business	-0.009	-0.042	-0.001	-0.079**
	(0.010)	(0.028)	(0.005)	(0.020)
Humanities	-0.028**	-0.227**	-0.016**	-0.191**
	(0.010)	(0.031)	(0.005)	(0.019)
Creative arts	-0.024*	-0.268**	-0.020**	-0.211**
	(0.011)	(0.031)	(0.006)	(0.020)
Education	0.008	-0.036	-0.003	-0.053*
	(0.015)	(0.052)	(0.006)	(0.022)
Combined degree	-0.017	-0.208**	-0.020	-0.151**
	(0.038)	(0.067)	(0.024)	(0.041)
Grades (ref. at most lower second-class)				
Upper second-class honours	0.011*	0.101**	0.010*	0.070**
	(0.005)	(0.011)	(0.004)	(0.011)
First-class honours	0.029**	0.196**	0.020**	0.134**

	(0.005)	(0.013)	(0.005)	(0.014)
University attended (ref. other old)				
Former polytechnic	-0.003	-0.024+	0.004	-0.028*
	(0.005)	(0.014)	(0.003)	(0.011)
Russell group	0.007	0.078**	0.002	0.045**
	(0.005)	(0.012)	(0.004)	(0.011)
Activity status six months (ref. paid work)				
Unpaid work	-0.003	-0.195**	-0.004	-0.140**
	(0.014)	(0.032)	(0.009)	(0.023)
Unemployed	-0.056**	-0.137**	-0.042**	-0.119**
	(0.009)	(0.015)	(0.008)	(0.017)
Further study	-0.010*	-0.001	-0.005	0.050**
	(0.004)	(0.011)	(0.003)	(0.009)
Not available for employment	-0.015	-0.062*	-0.020*	-0.015
	(0.010)	(0.024)	(0.008)	(0.027)
Year of graduation (ref. 2005)				
2007	-0.016**	0.040**	-0.009*	0.046**
	(0.005)	(0.013)	(0.003)	(0.010)
2009	-0.017*	0.153**	-0.007	0.153**
	(0.008)	(0.022)	(0.005)	(0.018)
Part-time		-0.780**		-0.679**
		(0.043)		(0.029)
Temporary contract		-0.104**		-0.071**
		(0.016)		(0.012)
Work in London		0.227**		0.193**
		(0.011)		(0.010)
Observations	10,592	8,011	14,248	11,480

+: p<0.1; *: p<0.05; **: p<0.01, standard errors are clustered by local authority of origin.