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The Over-Education of UK Immigrants:
Evidence from the Labour Force Survey.

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Abstract

We investigate the incidence of over-education, as well as the effect on earnings, for immigrants and natives drawn from the Labour Force Survey between 1993 and 2003. This paper investigates whether immigrants are more or less likely to be over and under-educated than are natives and if there is any evidence of economic assimilation in such propensity differences. In addition we examine whether immigrants exhibit a larger or smaller earnings for over-education compared to natives. We find that native born non-whites and immigrants are more likely to be over-educated, even after conditioning on all other socio-economic factors (including ethnicity and English speaking country of origin). However, we also find evidence of assimilation in the incidence of immigrant over-education towards that of natives. Finally, we find that over-education implies a lower return to earnings for immigrants and non-white natives, compared to native born whites. The largest loss in earnings due to over-education actually applies to white education entrants, moreover we find no significant return to over-education for non-white labour market entrants, once we distinguish between these two immigrant groups.

Keywords: over-education, earnings, immigrants, assimilation.

JEL Codes: J24, J7.

1. Introduction

A recent report by the Home Office suggested that the UK policy on immigration "will introduce a simpler, clearer, more effective scheme for those wishing to come and work here, focusing on the highly skilled migrants that can help us build our economy."[1] Indeed recent empirical evidence suggests that on average, immigrants do perform better in the UK labour market in terms of higher employment and earnings than their native born counterparts (Bell 1997; Clark and Lindley 2005). However ethnic differences still exist, with non-white immigrants tending to perform worse, compared to both white natives and white immigrants (Clark and Lindley 2005). Disadvantaged workers may possess higher levels of education than is the requirement of their job simply because they do not find employment in inappropriately skilled occupations. The basic assumption of the human capital model is that individuals invest in education up to the point where the marginal costs of and the benefits to education are equalized. However, the amount of education required to maximize these returns are not so clear-cut for immigrants because the returns to education are not apparent at the time of investment. As a consequence immigrants may disproportionately experience over-education. This is evident through a process of economic assimilation, whereby immigrants initially experience higher over-education although this is eroded as they enhance their levels of country specific human capital with time spent in the host country. Employers may not value foreign qualifications equally to those attained in the UK. This provides a further barrier to immigrants trying to attain employment (see Friedberg 2000 for a discussion). Also immigrants may experience racial discrimination within the labour market.

Of course we may observe over-education without necessarily attributing this to economic inefficiency. For example, there may be differences in the quality of schooling between workers so that workers have the same level of schooling but some took longer than others to acquire it. Also, some workers may have lower levels of schooling but higher levels of job experience to compensate, so that it is skills rather than schooling that should be compared. Finally, over-education may be a consequence of career mobility, since some higher educated workers may be in the early stages of their career and awaiting accelerated progression.

Previous evidence suggests that the consequences of over-education on earnings are mostly negative. Empirical studies find that the returns to over-education, whilst positive, are generally less than the returns to required education (Sicherman 1991; Sloane *et al* 1999; Dolton and Vignoles 2000; Hartog 2000). Hence there is a negative earnings effect associated with not utilizing education fully. However, there have been few studies investigating over-education amongst immigrant workers. One exception is the study by Battu and Sloane (2004) who focus on ethnic differences. They find that workers from different ethnic groups have varying levels of mismatch between education and occupation and also that the holding of foreign qualifications increases the likelihood of mismatch for members of some ethnic groups but reduce it for others. For non-whites,

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[1] The Home Secretary's five year strategy for reform on immigration: `Controlling our Borders: Making migration work for Britain' made in February 2005 available at
http://www.official-documents.co.uk/document/cm64/6472/6472.htm

they find evidence that the effect of an over-education on earnings is larger for immigrants compared to those born in the UK.[2]

We add to this literature by focusing specifically on the over-education of immigrants. This is undertaken in two ways. First, we investigate whether immigrants are more likely to be over and under-educated than are natives and if there is any evidence of economic assimilation towards that for natives. Second, we examine whether immigrants exhibit a larger or smaller earnings differences as a consequence of over-education compared to natives. A further novelty here is that our data set allows us to examine whether differences exist between the returns to ethnic groups of immigrant workers. To do this both over/under-education and earnings equations for immigrants and natives are estimated paying particular attention to racial differences between ethnic minority groups.

The paper proceeds as follows. The next section provides an overview of the data and presents some descriptive statistics to compare the average schooling of immigrants and natives. Section 3 describes the econometric models used in the paper, whilst sections 4 and 5 provide the empirical results for the incidence of over and under-education, as well as the determinants of earnings, respectively. The final section concludes.

2. Data and descriptive statistics

The data are drawn from the Labour Force Survey (LFS), conducted by the Office for National Statistics (ONS), and represent pooled cross-sections over the period 1993-2003.[3] One advantage of using the LFS is that is provides adequate sample sizes for analyzing immigrant and ethnic minority groups. The LFS collects information on earnings, employment and socio-economic characteristics such as age and martial status. The survey also collects human capital information in the form of years of schooling and the type of qualification held by the respondent. However, all foreign qualifications are coded into the one category of `other' qualification regardless of the level. It is therefore not possible to compare foreign qualifications to UK qualifications using this data set. As a consequence, years of schooling are used as a measure for human capital throughout this paper. This is defined here as `year left full time education' minus 5 years.

The sample consists of male and female full-time workers aged between 16 and 65 at the time of interview.[4] Despite the large sample size of the LFS, there is still a need in some cases to combine ethnic groups. Black Caribbean and Black Other groups generally both share a Caribbean background (see Holdsworth and Dale 1999). Accordingly, the ethnicity categories used in this paper are: `White', `Black Caribbean and Black Other', `Black African', `Indian', `Pakistani and Bangladeshi', `Chinese and Other groups'. The numbers of Chinese are too small to be reliable in most analyses and we therefore

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[2] Battu and Sloane (2004) estimate a separate wage equations for non-white immigrants and natives. They do not include white immigrants as a separate group. They measure of over-education using a binary variable based on the modal level of qualification by occupation.

[3] Since 1992 the Quarterly LFS (QLFS) has been based on a systematic random sample design, which makes it representative of the whole of Great Britain. Further details on the sampling methodology and questionnaires are available from the ONS at http://www.ons.gov.uk.

[4] All earnings data were deflated to a common year. All models are estimated using hourly wages and obtained qualitatively similar results.

exclude them from our discussion. Overall after excluding observations with missing data and trimming outliers the sample is made up of 242,617 native and 16,956 immigrant men and women.[5]

Table 1 shows mean levels of schooling for immigrants and natives by ethnicity. The final row shows that on average both natives and immigrants have around 15 years of schooling. However, there are notable differences between ethnic groups. For natives, most non-white groups possess higher levels of schooling than whites, with the exception being Caribbean men who have the same average of 13 years. The same can be said for immigrants where average schooling levels again exceed those of white natives. Comparing non-white immigrants to their native counterparts shows that Indian men and other ethnicity (which includes Chinese) tend to have more schooling on average. One explanation is that higher levels of education are a consequence of disproportionately higher unemployment propensities experienced by non-whites during the early 1990s recession (see Lindley 2005). Table 1 also supports the need for the distinction between white natives and white immigrants since the latter tend to have much higher schooling levels.

Given that immigrants and non-white natives tend to possess more schooling on average than white natives, it is interesting to see whether they are more or less likely to be over-educated. Following the existing literature, a distributional measure of over and under-education is used in this paper.[6] A comparison is made between the mean level of education for an occupation and that level actually attained. That is, required education is equal to the mean level of schooling for that individual's three-digit occupation.[7] This is calculated separately for a younger age group (16-35) and an older age group (36-65), as well as by survey year in order to minimise bias associated with occupational skill upgrading. Over-education is defined as one standard deviation above required education. Similarly under-education is one standard deviation below required education.

The measure of over-education used throughout the paper has its drawbacks. First, information on years of schooling is derived from the year that the individual left full time education, although the year they started education is unknown. Also, a more accurate measure for over-education could be attained if occupation data were available at a more detailed level than the 3 digit. One advantage of this data however, is that it is one of the only UK data sets that allows the comparison of immigrant schooling to that of natives.

Table 2 shows the percentage of educational mismatch for immigrants and natives again by ethnicity. The top panel refers to men and the lower panel to women. The final rows show that male natives tend to be over-educated (37 percent) or have the required level of schooling (36 percent), rather than under-educated (26 percent). Compared to men, there are more females under-educated (38 percent) and less with the required education (29 percent).

Clearly, immigrants are more likely to be over-educated (63 percent compared to 37 percent for native men) and less likely to be have the required schooling and under-

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[5] Trimming the top and bottom 1 percent of the earnings distribution involved a loss of 7624 observations from our sample.

[6] A self assessed measure for over-education is not available from the QLFS.

[7] All models are estimated using a modal measure of required education and obtained qualitatively similar results.

educated compared to white natives. Furthermore, immigrants are generally more likely to be over-educated than their own ethnic native-born counterparts, with non-whites displaying very high percentages. At the other end of the spectrum most immigrants are less likely to be under-educated. In short, Table 2 suggests that immigrants generally have a much higher incidence of over-education compared to natives, although there is an extra negative effect associated with being non-white.

3. The econometric modelling

Following the existing literature on mismatch between education and occupation, our econometric model incorporates a three-regime multinomial logit specification.[8] The base category consists of full time workers who have the required level of schooling for their own occupation. That is their actual schooling level is equal to the mean schooling level for their own three-digit occupation. In addition there are workers who have more schooling (over-educated) and workers who have less schooling (under-educated), than the mean for their own three-digit occupation. These three alternative regimes are of course mutually exclusive.

The latent variable S_m^* represents the worker being in any one regime. This takes one of the three discrete values, 0, 1 and 2 for required, over-educated and under-educated respectively. A set of typical controls are included (size of firm, region of residence, marital status, presence of children and age), as well as ethnicity and immigrant assimilation variables such as arrival cohort and years since migration.[9] A foreign schooling dummy variable is also included, as well as a dummy variable indicating whether English is generally spoken in the country of origin.[10] We also include the national unemployment rate at the time of entry into the UK labour market in order to detect any economic scarring effects on the incidence of over and under required schooling. For natives and immigrants who arrived in the UK as children (and therefore directly into the UK education system) this is the unemployment rate for the year the worker left full time education. For immigrants who arrived directly into the UK labour market this is the unemployment rate during the year of arrival.

To compare the likelihood of required, under and over-education between immigrants and natives our multinomial equation is first estimated on a pooled sample of immigrants and natives, although separately for whites and non-whites as well as for men and women. Following this, separate equations are estimated for immigrants and natives so that parameters can be compared across immigrant groups.

To assess the effect of schooling on earnings, the following earnings equation is estimated:

$$Y_i = X_{ik}\beta_k + \gamma_1 S^R + \gamma_2 S^O + \gamma_3 S^U + \varepsilon_i \qquad (1)$$

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[8] We find that our results are qualitatively robust to the choice of error structure implied by the multinomial logit model when compared to an ordered logit. A full set of estimates are available from the authors on request.

[9] See Dolton and Silles (2001) for a discussion on the determinants of over-education.

[10] See http://www.aneki.com/english.html for a list of English speaking countries.

where Y_i are log gross weekly earnings and X_{ik} is a vector of k covariates containing the usual socio-economic characteristics (size of firm, region of residence, occupation, marital status, age, ethnicity, English speaking country of origin and immigrant arrival cohorts). This is referred to as the over-required and under-required (ORU) specification by Hartog 1997; Groeneveld and Hartog 2004, where human capital is measured using required education (namely the mean schooling years per three digit occupation of employment) denoted here as S^R, as well as variables to measure the extent of over-required S^O and under-required S^U education. Actual years of schooling S is decomposed into its composite demand side components

$$S = S^R + S^O - S^U \tag{2}$$

and $\qquad S^O = S - S^R$ if $S > S^R$ and $S^O = 0$ *otherwise* $\qquad$ (3)

and $\qquad S^U = S^R - S$ if $S < S^R$ and $S^U = 0$ *otherwise* $\qquad$ (4)

Hence γ_1 measures the return to required education and therefore the return to an extra year of schooling for an individual with the required level of schooling. In addition, γ_2 measures the return to an extra year of schooling for an over-educated individual. If $\gamma_2 > 0$ this suggests that an over-educated worker will exhibit a higher return than a worker with required schooling employed in their own occupation. If $\gamma_1 > \gamma_2$ then an over-educated worker will have a smaller return than a worker with required schooling and the same level of schooling as themselves employed elsewhere. Similarly, γ_3 measures the return to schooling for an under-educated person. One would expect $\gamma_3 < 0$ since such a worker will exhibit lower returns than all workers with the required level (within their own occupation and those who have the same level as schooling as themselves).[11] One-digit occupation dummies are also included in the specification and equation (1) is estimated separately for white natives, white immigrants, non-white natives and also non-white immigrants.

We also compare immigrants who enter the UK labour market, having completed their education at some time in the past, with those who arrive to complete their education in the UK and subsequently enter the labour market. We call this first group "labour market entrants" and the latter group "education entrants".[12] Note that the group of education entrants includes foreign-born children who arrive with their parents as well as adults who arrive to undertake education in the UK. Again all equations are estimated separately for men and women.

Finally, we make no attempt to correct for employment selection bias for two reasons. First, corrected estimates tend to rely heavily upon, often arbitrary, instruments used to

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[11] The ORU model provides an alternative to the Mincer `human capital' approach. The Mincer approach assumes that only the human capital variables matter (ie actual schooling). The ORU approach accommodates the Mincer equation as a special case when $\gamma_1 = \gamma_2 = -\gamma_3$ in equation (1). When these equalities do not hold this allows for demand side variables to play a role through required schooling. An extreme case would be when only required schooling would be valued regardless of the specific schooling attainment of the worker; $\gamma_2 = \gamma_3 = 0$ in equation (1). This case has been linked to the `job competition' model where marginal productivity resides in the job rather than the worker (productivity and wages are assumed fixed in relation to specific jobs).

[12] A labour market entrant arrived in the UK after or during the year they left full time education. Contrariwise an education entrant entered the UK before they left full time education.

identify the earnings equations. Second the component of the immigrant-native earnings differential that can be attributed to differences in employment selectivity is likely to be negligible.[13] Similarly, we make no attempt to control for endogenous education choices. A valuable literature has emerged that evaluates the accuracy of OLS coefficients against results derived from careful elimination of a range of biases, including measurement error and endogenous education shocks, Dearden (1999a, 1999b). The conclusion of this literature is that failure to control for ability and family background characteristics that influence education choices will bias OLS estimated upwards, while measurement error leads to a downward bias. Hence OLS estimates provide quite reasonable estimates of the true returns to education.

4. The Determinants of Required, Over and Under-Edcuation.

The key coefficients and marginal effects for the multinomial logits are contained in Tables 3 and 4, for men and women separately.[14] A full set of estimates are available from the authors on request. Table 3 estimates a single multinomial equation whilst Table 4 estimates the multinomial model separately for immigrants and natives. The default category consists of white natives with only British attained schooling, unmarried, has no children, employed in a firm with less than 25 employees, lives in the South East and is not employed in the manufacturing sector.

In Table 3, all non-whites, with the exception of black Caribbean's, are more likely to be over-educated than whites. The largest effect is found for African males who are 28 percent more likely to be over-educated than white males. Possessing some foreign schooling also has a positive effect on being overeducated. Conditioning on all other socio-economic variables, including ethnicity, immigrants are more likely to be over-educated, with cohort effects providing most of the explanatory power in the model. Men who arrived in the UK in 2000-3 are found to be 29 percent more likely to be over-educated than the base, an increase of 11 percentage points higher than in the previous decade and some 19 percentage points higher than in the 1980s. The `years since migration' variable indicates that immigrants, although more likely to be over-educated than natives on entry to the UK labour market, exhibit an erosion of this differential with time spent in the UK. Hence there is some evidence here of assimilation in over-education and that higher skilled immigrant workers reduce their likelihood of over-education with duration in the UK. The unemployment rate on entry to the labour market has the expected positive sign, which provides some evidence of detrimental scarring on over-education incidence.

For under-education, only Caribbean men and Indians are significantly less likely to be under-educated compared to whites. Furthermore, immigrant cohort effects are

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[13] Blackaby *et al.* (2002) correct for selectivity bias and observe changes in the white/non-white earnings differential of around one percent.

[14] A likelihood ratio test (test statistic of 1301.55) rejects the null hypothesis of common slope coefficients between men and women. Hence the structural determinants of mismatch are gender specific. The Hausman test for the independence of irrelevant alternatives (IIA) rejects the null that the difference in coefficients across the three outcomes is significantly equal to zero. Hence the IIA assumption is not violated.

generally not significant with only immigrants arriving before the 1950s being more likely to be under-educated, compared to natives. The `years since migration' variable is not statistically significant which suggests that observed immigrant differentials are not eroded over time.

Turning now to the separate equation estimates for immigrants and natives, contained in Table 4.[15] Men are detailed in the first panel and therefore are discussed first. Comparing the parameters across the two equations, the ethnicity variables show Caribbean men to be less likely, whilst all other non-whites are more likely, to be over-educated compared to whites. The immigrant arrival cohort variables are again positive and significant which supports the existence of detrimental immigrant cohort quality effects to those who arrived later than 1959. To say something about assimilation, we can compare the effect of age.[16] Immigrants demonstrate a slightly steeper profile than natives that reaches a maximum at 58 years old, compared to 32 for natives. This suggests that the initial immigrant-native differential observed in Table 3 may not be eroded over time because age profiles are generally flatter for natives. Immigrants that arrived into the UK labour market are 18 percent less likely to be over-educated compared to those who arrived into the education system, whilst having some degree of foreign schooling and arriving in a period of high unemployment has a positive effect of around 3 percent.

For under-education, only native born Caribbean men are less likely to be under-educated compared to white native men. All non-white immigrants, with the exception of Africans, are less likely to be under-educated compared to their white counterparts. The arrival cohort and age variables are now statistically insignificant for immigrant males. Immigrants that arrived into the UK labour market are 12 percent more likely to be over-educated compared to those who arrived into the education system.

The second panel in Table 4 reveals that for female natives, non-white women are generally more likely to be over-educated compared to whites. However, for immigrant women, being from the Caribbean reduces the probability of being overeducated whilst being Indian or from the 'other ethnic' group increases the probability of being under-educated compared to white immigrants.

As with men, immigrant arrival cohort effects indicate higher incidence of over-education to the more recent arrival cohorts and there is little evidence of assimilation, since age is barely statistically significant for immigrants. For under-education, only immigrants indicate significant ethnicity effects (negative for Indian women), as well as immigrant cohort effects that suggest detrimental effects for those who arrived more recently (except for those who arrived 2000-3), compared to those who arrived before 1959. Being labour market entrant decreases (increases) the likelihood of over-education

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[15] Likelihood ratio tests (test statistics of 269.53 for men and 120.38 for women) reject the null hypotheses of common slope coefficients between immigrants and natives. Hence the structural determinants of mismatch are immigrant status specific. Again Hausman tests show that the IIA assumption is not violated in both the native and immigrant equations.

[16] Given that there is a linear relationship between survey year (Y), arrival cohort (C) and years since migration (M), whereby Y=C+M, the years since migration variable is now excluded from the immigrant equation. In the separate equation model assimilation can be measured by comparing the respective age profiles of immigrants and natives. This definition of economic assimilation is preferred since it allows immigrants and natives to be compared at the same point in their life cycle.

(under-education) and there is evidence from the unemployment on entry of detrimental scarring effects.

5. The effect of over and under-education on earnings.

To assess the effect of over and under-education on earnings, standard earnings equations are estimated with human capital measured through required education (mean schooling at the three-digit occupation level), as well as over-required education and under-required education as defined in equations (2) to (4). Equation (1) is estimated separately for white natives, non-white natives, white immigrants and non-white immigrants.[17] The default category consists of an unmarried, non-home owner, who has no children, is employed in a firm with less than 25 employees, lives in the South East and is not employed in the manufacturing sector. There are the added defaults of being Caribbean in the non-white equations, arriving in the UK before 1959 in the immigrant equations and being born in Europe in the white immigrant equation.

The estimates are presented in Table 5 and only the key results concerning returns to schooling and English language are discussed. For men, over and above all other characteristics (including occupation, ethnicity and English spoken in the country of origin) the returns to required education are higher for non-white immigrants (8 percent) and lower for white immigrants (5 percent), compared to natives (7 percent).[18] The effect of over- education is positive and significant across all groups, although the coefficients are smaller than for required education in all cases as we expect. Therefore, an over-educated worker earns more than a worker with the required schooling level (employed in their own occupation) but less than they could earn should their actual and required schooling be equalized.

Comparing across groups, the over-education return is largest for white natives at 2.5 percent which is consistent with previous studies (Sloane *et al* 1999; Groot and Maassen van den Brink 2000). The return is smaller for non-white natives (1.5 percent) and the smallest return for immigrants (0.9 percent for both white and non-white immigrants). Over-educated immigrants therefore do not earn that much more than those immigrants with the required schooling within their own occupation, although they could earn substantially more should they attain a match between required and actual schooling. The negative earnings effect associated with being under-educated is around 4 percent for all groups.

For women we find that all returns to all levels of schooling are larger than those for men. However, the returns to required education are larger for white women (9 percent) than for non-whites (5.5 percent). Comparing over-education returns across the groups, the largest return is for white natives (3.2 percent), whilst the smallest is for non-white immigrants (0.8 percent). Non-white natives and white immigrants exhibit similar over-education penalties (2.5 and 0.2 percent respectively). Hence the over-education returns to white immigrants and non-white natives are similar to those of white natives. It is

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[17] Chow tests (test statistics of 69.22 for men and 23.60 for women) reject the null hypotheses of common slope coefficients between white natives, white immigrants, non-white immigrants and non-white natives. Hence the structural determinants of earnings differ across immigrant status and for whites and non-whites.
[18] Where the percentages are calculated using $[\exp(\beta)-1] \times 100$. We acknowledge that some differences are small and therefore may not be statistically significant.

female non-white immigrants that exhibit the smallest returns (similar to those of immigrant men). The lower earnings associated with being under-educated is generally smaller for non-white natives and immigrants than for white native females.

Including whether English is spoken in the country of origin shows a positive return on earnings of around 4 percent for white men and women, although this effect is not statistically significant for non-white immigrants.

In short, compared to matched immigrants employed in their own three-digit occupation, the return to over-educated immigrants is not that much more (0.9 percent for male white and non-white immigrants). Over-educated natives earn comparatively more in this regard (around 2.5 percent for white native men). However this implies that non-white immigrants could increase their return to schooling by up to 6.9 percentage points, compared to 4.4 percentage points for white native men if they could obtain a job appropriate to their education.[19] So over-education involves a larger loss of earnings for non-white natives and immigrants (except non-white native females) in terms of what they would earn should they match actual and required schooling.

For white immigrant men (women) the wage loss associated with over-education is 4.6 (6.5) percentage points relative to when they equalise required and actual schooling. This is lower than that for non-white immigrants and around the same as that for white natives at 4.4 (6.1) percentage points for men (women). Given that non-white native men have been educated in the UK and still experience lower earnings for over-education of 6.8 percentage points, this provides some evidence of discriminatory factors over and above those picked up from the conventional ethnic controls.

Finally, Table 6 presents the key results for white and non-white immigrants distinguishing between `labour market' entrants who possess no formal British schooling and `education entrants' who arrive into the UK education system and subsequently enter into the labour market with some British schooling.[20] The sample of immigrants is made up of around 50 percent of each.

Comparing the required education returns across groups, these are generally higher for non-white men and all women. The high return to required education of 7.8 percent for non-white immigrant men, seen in Table 5, is being driven by non-white labour market entrants who in fact have no formal British schooling (8.5 percent in Table 6).

Speaking English in the country of origin only has a significant positive return of around 8 percent for white labour market entrants and surprisingly has a negative return of 1 percent for white female education entrants.

Comparing the difference between over-education and required education, white labour market entrants could increase a higher return to schooling should they attain a match (4.1 and 6.1 percent for men and women), compared to non-white education entrants (3.8 percent for men and women). Therefore, white immigrants may be experiencing a large over-education effect as a consequence perhaps of under-valued foreign qualifications, but this does not apply to non-whites. It is only non-whites with some British schooling that demonstrate significant over-education penalties. Non-whites who arrived directly into the labour market in fact obtain no return to their extra years of

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[19] For non-white immigrant men the return to required schooling is 0.78, whilst the return to over-required schooling is 0.009. Hence the increase in the return from an over-educated non-white immigrant to a one with the required level of schooling is 6.9 percent.

[20] A full set of results is available from the authors on request.

education at all. For women, white education entrants experience the largest over-education effects (6.9 percent).

6. Conclusions

In this paper we firstly investigate whether immigrants are more or less likely to be over and under-educated in the labour market and whether there is evidence of economic assimilation. Our data allow us to distinguish between ethnic groups within our immigrant sample. Secondly, we analyse the earnings return to required, over and under-education levels and for separate ethnic groups within our immigrant set. Finally, we further divide our immigrants into those with and without time spent in the British education system.

The results in this paper show that ceteris paribus, non-white natives and all immigrants are more likely to be over-educated compared to white natives, especially Africans and Indians of both genders along with Pakistani/Bangladeshi women. The single equation estimates of required, under and over-education suggest that immigrants initially experience higher over-education but that this difference is eroded with time spent in the UK. Hence imposing the restriction that the determinants of the model are the same for immigrants and natives provides the optimistic picture of immigrant assimilation in over-education.

If we are to assume that the determinants of required, over and under-education differ for immigrants and natives, as the statistical tests undertaken in this paper suggest, then a less optimistic picture emerges. Comparing age profiles across groups suggests a flatter curve for natives and therefore that there is little assimilation in the initial over-education propensities over time. Furthermore, ethnic differences between immigrants are still apparent, with Africans and Indians still demonstrating higher probabilities of over-education compared to white immigrants.

In terms of the effect of over-education on earnings, returns to required schooling are generally higher for immigrant men and white immigrant women. This implies that the negative return associated with being over-educated is larger for immigrants compared to that for native white men. There is some evidence that these lower returns may be because of under-valued foreign schooling for white immigrants, but not for non-white immigrants. Non-whites who arrived directly into the labour market in fact obtain no return to their extra years of education at all, once immigrants are analysed separately from those who arrived directly into the British education system.

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Table 1. Mean schooling levels for immigrants and natives by ethnic group

| | Men | | Women | |
	Native	Immigrant	Native	Immigrant
White	13	15	13	15
	(148,343)	(5,542)	(90,825)	(4,684)
Car/oth	13	13	14	13
	(657)	(473)	(678)	(501)
African	17	17	16	16
	(109)	(379)	(83)	(321)
Indian	15	16	15	15
	(427)	(1,427)	(356)	(915)
PB	15	15	15	15
	(215)	(681)	(143)	(162)
Other	14	16	15	16
	(432)	(1,011)	(349)	(860)
Total	15	15	15	15
	(150,183)	(9,513)	(92,434)	(7,443)
	159696		99,877	

Notes: Data are unweighted.   Sample size in parentheses

Table 2. Educational mismatch (percent).

Men

	Over-Educated		Required		Under-Educated		N
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants	
White	37	56	36	21	26	23	153,885
Car/oth	41	63	31	22	28	15	1,130
African	79	84	12	8	9	9	488
Indian	66	74	20	15	14	11	1,854
PB	61	63	24	19	15	18	896
Other	54	74	21	13	25	14	1,443
Total	37	63	36	19	26	19	159,696

Women

	Over-Educated		Required		Under-Educated		N
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants	
White	38	61	29	18	33	21	95,509
Car/oth	47	53	23	23	30	24	1,179
African	61	77	18	13	20	11	404
Indian	63	70	17	17	20	13	1,271
PB	52	58	29	18	19	24	305
Other	56	72	18	14	26	14	1,209
Total	38	63	29	18	33	19	99,877

Notes: Data are unweighted.

Table 3. Single equation multinomial logits for educational mismatch.
(Base category is required/matched education).

	Men				Women			
	Over-Education		**Under-Education**		**Over-Education**		**Under-Education**	
	Coefficient	**ME**	**Coefficient**	**ME**	**Coefficient**	**ME**	**Coefficient**	**ME**
Caribbean	-0.144** (0.074)	0.003	-0.361* (0.090)	-0.054	-0.006 (0.077)	-0.003	0.009 (0.088)	0.003
African	1.170* (0.176)	0.282	-0.002 (0.228)	-0.136	0.552* (0.157)	0.171	-0.287 (0.216)	-0.117
Indian	0.637* (0.073)	0.183	-0.222* (0.095)	-0.111	0.598* (0.084)	0.170	-0.183 (0.112)	-0.107
PB	0.376* (0.096)	0.092	0.009 (0.120)	-0.043	0.649* (0.163)	0.143	0.134 (0.206)	-0.060
Other Eth	0.351* (0.078)	0.101	-0.119 (0.098)	-0.063	0.549* (0.091)	0.113	0.172 (0.110)	-0.039
UK >1959	1.025* (0.345)	0.133	0.836* (0.420)	0.028	1.412* (0.366)	0.206	0.916* (0.468)	-0.028
UK 1960-9	0.936* (0.312)	0.174	0.434 (0.388)	-0.039	1.118* (0.279)	0.167	0.734** (0.414)	-0.015
UK 1970-9	1.102* (0.271)	0.198	0.545 (0.335)	-0.042	1.197* (0.218)	0.225	0.484 (0.355)	-0.074
UK 1980-9	0.500* (0.196)	0.094	0.235 (0.242)	-0.016	0.698* (0.159)	0.128	0.325 (0.257)	-0.031
UK 1990-9	0.869* (0.127)	0.188	0.213 (0.158)	-0.069	1.195* (0.131)	0.238	0.382 (0.178)	-0.091
UK 2000-3	1.111* (0.231)	0.297	-0.296 (0.330)	-0.165	0.728* (0.226)	0.242	-0.614** (0.345)	-0.175
YSM	-0.054* (0.016)	-0.012	-0.009 (0.019)	0.004	-0.028* (0.008)	-0.006	-0.008 (0.020)	0.002
YSM sq	0.001*(0.0002)	0.0002	-0.0001 (0.0003)	-0.0001	0.00001** (0.0001)	0.0001	-0.0003 (0.0003)	-0.0001
F School	0.550* (0.073)	0.137	-0.007 (0.084)	-0.067	0.212* (0.087)	0.102	-0.423* (0.101)	-0.1036
U rate	0.108* (0.003)	0.030	-0.028* (0.004)	-0.018	0.086* (0.004)	0.027	-0.047* (0.004)	-0.021
N	159696				99877			

Notes: QLFS 1993-2003, data are unweighted. Standard errors are in parentheses.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
Unreported controls include age, age squared, survey year, marital status dummy, children
dummy, 2 firm size dummies, 10 regional dummies and a manufacturing dummy.
The default category is British schooling, unmarried, not a home owner, has no children,
employed in a firm with less than 25 employees, lives in the South East, not employed in
manufacturing, white and born in the UK

Table 4. Separate equation multinomial logits for educational mismatch.
(Base category is required/matched education).

(I) Men

| | Over-Education | | | | Under-Education | | | |
| | Natives | | Immigrants | | Natives | | Immigrants | |
	Coefficient	ME	Coefficient	ME	Coefficient	ME	Coefficient	ME
Caribbean	-0.234* (0.092)	-0.033	-0.153 (0.133)	0.028	-0.209** (0.112)	-0.017	-0.620* (0.160)	-0.065
African	1.321* (0.322)	0.313	0.890* (0.216)	0.179	0.020 (0.439)	-0.149	-0.071 (0.274)	-0.096
Indian	1.039* (0.144)	0.236	0.370* (0.093)	0.121	0.152 (0.196)	-0.100	-0.409* (0.116)	-0.090
PB	0.844* (0.189)	0.182	0.221** (0.120)	0.069	0.209 (0.250)	-0.066	-0.191 (0.146)	-0.050
Other Eth	0.224** (0.122)	0.038	0.258* (0.106)	0.090	0.136 (0.146)	0.001	-0.189 (0.120)	-0.069
UK 1960-9	-	-	0.328* (0.113)	0.094	-	-	0.0001(0.164)	-0.063
UK 1970-9	-	-	0.961* (0.148)	0.199	-	-	-0.281 (0.225)	-0.103
UK 1980-9	-	-	0.973* (0.196)	0.220	-	-	-0.223 (0.256)	-0.128
UK 1990-9	-	-	2.021* (0.222)	0.363	-	-	-0.555 (0.406)	-0.196
UK 2000-3	-	-	2.695* (0.314)	0.342	-	-	-0.189 (0.120)	-0.182
Age	0.066* (0.004)	0.012	0.084* (0.020)	0.018	0.033* (0.004)	-0.001	0.013 (0.024)	-0.008
Age sq	-0.001* (0.0001)	-0.0002	-0.001* (0.0002)	-0.0001	-0.0001* (0.0001)	0.0001	0.0001 (0.0003)	0.0001
Speak Eng	-	-	0.089 (0.066)	0.020	-	-	0.005 (0.080)	-0.010
L M entrant	-	-	-0.612* (0.093)	-0.179	-	-	0.337* (0.109)	0.123
F school	-	-	0.161** (0.095)	0.036	-	-	0.009 (0.110)	-0.018
U rate	0.104* (0.003)	0.028	0.119* (0.014)	0.030	-0.028* (0.004)	-0.018	-0.020 (0.018)	-0.017
N	150183		9513		150183		9513	

(II) Women

| | Over-Education | | | | Under-Education | | | |
| | Natives | | Immigrants | | Natives | | Immigrants | |
	Coefficient	ME	Coefficient	ME	Coefficient	ME	Coefficient	ME
Caribbean	0.167** (0.099)	0.032	-0.450* (0.138)	-0.109	0.071 (0.116)	0.020	0.021 (0.155)	0.055
African	1.030 (0.343)	0.231	0.278 (0.186)	0.091	0.161 (0.431)	0.052	-0.351 (0.263)	-0.066
Indian	0.915* (0.152)	0.237	0.317* (0.110)	0.096	-0.108 (0.213)	0.025	-0.299* (0.141)	-0.066
PB	1.198* (0.257)	0.237	0.031 (0.218)	0.023	0.398 (0.318)	0.040	-0.158 (0.280)	-0.023
Other Eth	0.700* (0.155)	0.120	0.336* (0.116)	0.068	0.375* (0.181)	0.028	0.041 (0.143)	-0.030
UK 1960-9	-	-	0.661* (0.137)	0.112	-	-	0.284** (0.148)	-0.034
UK 1970-9	-	-	1.320* (0.169)	0.231	-	-	0.308 (0.193)	-0.094
UK 1980-9	-	-	1.554* (0.229)	0.256	-	-	0.360 (0.273)	-0.107
UK 1990-9	-	-	2.532* (0.256)	0.376	-	-	0.580** (0.304)	-0.158
UK 2000-3	-	-	2.400* (0.336)	0.313	-	-	-0.184 (0.449)	-0.154
Age	0.053* (0.005)	0.005	0.046** (0.024)	0.005	0.065* (0.006)	0.001	0.049** (0.029)	0.002
Age sq	-0.001* (0.0001)	-0.0001	-0.0002 (0.0003)	-0.0001	-0.0005* (0.0001)	0.00001	- 0.0002 (0.0003)	-0.00001
Speak Eng	-	-	0.021 (0.073)	0.021	-	-	-0.149 (0.091)	-0.023
L M entrant	-	-	-0.693* (0.103)	-0.170	-	-	0.163 (0.126)	0.096
F school	-	-	0.083 (0.113)	0.077	-	-	-0.480* (0.136)	-0.084
U rate	0.084* (0.004)	0.026	0.056* (0.017)	0.017	-0.048* (0.005)	0.001	-0.043* (0.021)	-0.012
N	92434		7443		92434		7443	

Notes: QLFS 1993-2003   Data are unweighted. Standard errors are in parentheses.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
Unreported controls include survey year, marital status dummy, children dummy, 2 firm size dummies, 10 regional dummies and a manufacturing dummy.
Default category is unmarried, not a home owner, has no children, employed in a firm with less than 25 employees, lives in the South East, not employed in manufacturing and white. For the immigrant equation there is the extra default of arriving in the UK before 1959, being a white European and having no foreign schooling.

Table 5. Key results for the effect of mismatch on earnings.

(I) Men

| | Natives | | | | Immigrants | | | |
| | Whites | | Non-Whites | | Whites | | Non-Whites | |
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
R education	0.069*	0.001	0.070*	0.011	0.054*	0.005	0.078*	0.007
O education	0.025*	0.001	0.015*	0.005	0.009*	0.003	0.009*	0.003
U education	-0.036*	0.001	-0.037*	0.016	-0.044*	0.007	-0.037*	0.007
Speak Eng	-	-	-	-	0.040*	0.013	0.012	0.018
N	148343		1840		5542		3971	

(II) Women

| | Natives | | | | Immigrants | | | |
| | Whites | | Non-Whites | | Whites | | Non-Whites | |
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
R education	0.093*	0.002	0.055*	0.012	0.085*	0.007	0.060*	0.008
O education	0.032*	0.001	0.025*	0.005	0.020*	0.003	0.008*	0.003
U education	-0.054*	0.002	-0.001	0.014	-0.031*	0.007	-0.015*	0.007
Speak Eng	-	-	-	-	0.037*	0.013	-0.002	0.017
N	148343		1840		5542		3971	

Notes: QLFS 1993-2003. Data are unweighted.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
Unreported controls include survey year, marital status dummy, children dummy, 2 firm size
dummies, 10 regional dummies, a manufacturing dummy, eight occupational dummies, four
ethnicity dummies, age, age squared and five immigrant arrival cohort dummies.
The default category is unmarried, employed in a firm with less than 25 employees, lives in the
South East, not employed as a manager in manufacturing. For the non-white equations there is the
extra default of being Caribbean and for the white immigrant equation being European white. For
the immigrant equation there is the extra default of arriving in the UK before 1959.

Table 6. Key results for the effect of mismatch on immigrant earnings.

(I) Men

	Labour Market Entrants: Arrived UK>=Year left Full Time Education				Education Entrants: Arrived UK<Year left Full Time Education			
	White		**Non-White**		**White**		**Non-White**	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
R education	0.052*	0.009	0.085*	0.010	0.057*	0.007	0.060*	0.010
O education	0.011*	0.004	-0.002	0.004	0.005	0.004	0.022*	0.004
U education	-0.034*	0.010	-0.053*	0.011	-0.057*	0.010	-0.029*	0.009
Speak Eng	0.077*	0.020	-0.001	0.025	0.010	0.016	0.037	0.026
N	2480		2219		3062		1752	

(II) Women

	Labour Market Entrants: Arrived UK>=Year left Full Time Education				Education Entrants: Arrived UK<Year left Full Time Education			
	White		**Non-White**		**White**		**Non-White**	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
R education	0.075*	0.009	0.064*	0.011	0.099*	0.010	0.050*	0.012
O education	0.014*	0.004	0.004	0.005	0.030*	0.004	0.011*	0.005
U education	-0.034*	0.010	-0.020**	0.011	-0.028*	0.011	-0.019*	0.009
Speak Eng	0.078*	0.019	-0.022	0.022	-0.010*	0.018	0.022	0.028
N	2433		1636		2251		1123	

Notes: QLFS 1993-2003. Data are unweighted. Standard errors are in parentheses.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
Unreported controls include survey year, marital status dummy, children dummy, 2 firm size dummies, 10 regional dummies, a manufacturing dummy, eight occupational dummies, four ethnicity dummies, age, age squared and five immigrant arrival cohort dummies.
The default category is unmarried, employed in a firm with less than 25 employees, lives in the South East, not employed as a manager in manufacturing and arriving in the UK before 1959. For the non-white equations there is the extra default of being Caribbean and for the white immigrant equation being European white.