Sheffield Economic Research Paper Series

SERP Number: 2007013

ISSN 1749-8368

Joanne Lindley

The Over-Education of UK Immigrants and Minority Ethnic Groups: Evidence from the Labour Force Survey.

September 2007

Department of Economics
University of Sheffield
9 Mappin Street
Sheffield
S1 4DT
United Kingdom
www.shef.ac.uk/economics

Abstract:

The paper explores the incidence of over and under education and the effect on earnings for immigrants and natives who hold UK qualifications, drawn from the Quarterly Labour Force Survey 1993-2003. The paper also compares earnings penalties associated with over and under education across immigrant and minority ethnic groups for men and women. The results show that compared to native born Whites, Black African, Other Non-White and Indian men are more likely to be over-educated, whilst for women it is Indian and Pakistani/Bangladeshis who are more likely to be over-educated. Estimating earnings equations shows significantly large over-education penalties for South Asian immigrant and native men, as well as White immigrant men, Black women and White UK born women. However, there are large returns to occupational skills for some minority ethnic and immigrant groups, over and above the returns to qualifications. It is suggested that these groups may therefore find it easier to find a suitable job for their UK education level if higher or further education programmes were combined with occupational specific training.

Keywords: over-education, earnings, immigrants, ethnic minorities

JEL Codes: J24, J7.

Acknowledgements: The author is grateful to the two referees for their invaluable comments, as well Steven McIntosh, Andy Dickerson, Sarah Brown and Karl Taylor for general support and advice. I would finally like to thank the Office for National Statistics and the Economic and Social Data Service for making available the data from the Labour Force Survey. All remaining errors are my own.

1. Introduction

The current UK immigrant population is fairly ethnically diverse. Before the Second World War approximately half of Britain's immigrants came from Old Commonwealth countries such as Canada, Australia and New Zealand.[1] However, from the 1950s onwards there were growing numbers from New Commonwealth countries such as the Caribbean, Africa and India (see Bell 1997). During the 1960s, UK immigration surged from Pakistan and Hong Kong, which peaked in the 1970s, and also from Bangladesh which reached its height in the 1980s. Changes in UK immigration legislation and membership of the European Community resulted in changes in the national-origin mix of immigration cohorts throughout the 1980s. There were large declines in the flows from India and East Africa and rises in the numbers coming from Europe. During the 1990s the UK experienced large numbers of asylum seekers from Eastern European Communist countries, but more recently these have been coming from a far wider range of countries that have no colonial or linguistic connections with Britain. A report from the United Nations High Commissioner for Refugees (2001) showed that the main applications in Europe came from the Federal Republic of Yugoslavia (10.3 percent), Iraq (8.4 percent), Afghanistan (7.0 percent), Iran (6.6) and Turkey (5.7 percent).

Recent empirical evidence suggests that on average, UK immigrants perform better than natives in the UK labour market, both in terms of higher employment and earnings (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). A standard argument in the literature is that racial inequality in the labour market can be reduced by encouraging investments in human

capital. However if disadvantaged workers possess higher levels of education and cannot successfully find employment in inappropriately skilled occupations, then the return to their qualifications will be relatively lower. This paper investigates whether there is a higher propensity for over-education and a lower return to education for minority ethnic groups and immigrants, after conditioning on differences in other socio-economic characteristics.

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 British studies investigating over-education amongst immigrant workers.[2] Exceptions include both Battu and Sloane (2004), as well as Dex and Lindley (2007) who focus on ethnic differences. Battu and Sloane (2004) 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, Battu and Sloane (2004) find evidence that the effect of an over-education on earnings is larger for immigrants compared to those born in the UK.[3]

Of course ethnic differentials in over-education may be observed without necessarily attributing this to labour market discrimination. For example, there may be differences in the `quality' of education in terms of subjects, grades and institutions attended. Battacharya et al. (2006) show that UK minority ethnic groups under perform in terms of

achieving 5 or more GCSE grades A-C.[4] Jones and Elias (2005) show that UK minority ethnic groups are far less likely than Whites to obtain a first or upper second class graduate degree, with Black Caribbean and African, as well as Pakistani/Bangladeshi students performing particularly low compared to White students.[5] Although Jones and Elias (2005) also show that grades for UK minority ethnic groups are fast improving.[6] In addition, some workers may have lower levels qualifications but higher levels of job experience to compensate, so that skills and experience are also important (Sicherman 1991). Immigrants are likely to possess much lower levels of UK labour market experience on average, although it is assumed that they accumulate UK specific knowledge and skills with time spent in the UK labour market. Finally, over-education differences 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 (see Dex and Lindley 2007).

This study adds to this literature by focusing specifically on the over-education of UK immigrants. This is undertaken in two ways. Firstly, a multinomial logit analysis is undertaken to determine whether immigrants with British highest qualifications are more likely to be over and under-educated than are natives and if there is any evidence of economic assimilation towards the situation for natives. Second, earnings equations are estimated to examine whether British educated immigrants and minority ethnic groups exhibit a larger or smaller earnings difference as a consequence of over-education compared to natives. Attention is also paid to the return on occupational skills that may exist over and above qualifications. A further novelty here is that the data set allows the distinction between composite minority ethnic groups.

The paper proceeds as follows. The next section provides an overview of the data and presents some descriptive statistics to compare the highest qualification levels 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 Quarterly Labour Force Survey (QLFS), conducted by the Office for National Statistics (ONS), and represent pooled cross-sections over the period 1993-2003.[7] One advantage of using the QLFS is that is provides adequate sample sizes for analyzing immigrant and ethnic minority groups. The QLFS collects information on earnings, employment and socio-economic characteristics such as age and martial status, but also human capital information in the form of years of schooling and the highest qualification held by the respondent. The definition of a native is being born in the UK. However, the QLFS codes all foreign qualifications into the one composite category of `other' qualification regardless of the level. Consequently, the sample of immigrants used throughout this analysis is restricted to those with UK highest qualifications. The sample therefore excludes 1982 and 1722 men and women (around 20 percent of the total immigrant sample) who have an `other' highest qualification and who arrived in the UK after they had left full time education (labour market entrants), since these immigrants should be the only group that with foreign qualifications as their highest qualification attained. Remarkably, over half of those immigrants who arrived directly

into the labour market coded themselves as having a UK qualification as highest. Table A1 in the Appendix compares sample means for this excluded sample to labour market entrants with UK highest qualifications. The excluded sample, are on average, slightly younger (average age for men is 39 compared to 40), more likely to live in the South East (67% for men compared to 58%), as well as arriving relatively more recently. Over 50 percent of the excluded labour market entrants arrived in the UK between 1990 and 2002, compared to 33 and 31 percent for male and female labour market entrants with UK highest qualifications. This may suggest a recent increase in the number of migrants entering the UK with foreign qualifications as their highest, but it also suggests that a substantial proportion of recent migrants entered directly into the UK labour market and somehow acquired UK qualifications. Not surprisingly, the excluded sample have slightly higher average schooling levels (men have 16 years compared to 15 years for labour market entrants with British highest qualifications, on average) supporting the decision to exclude these immigrants from the lowest National Vocational Qualification (NVQ) category, where `other' qualifications are placed.[8] Moreover, labour market entrants with foreign qualifications as their highest exhibit slightly lower gross weekly earnings on average (for men these are £341 compared to £345). Given their higher levels of schooling, this may provide some evidence that foreign gained qualifications are undervalued in the UK labour market.[9]

Despite the large sample size of the QLFS, 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 exclude them from our discussion. Overall after excluding observations with missing data and trimming outliers the sample is made up of 250,742 native and 13,894 immigrant men and women aged between 16 and 65.[10]

Table 1 shows the distribution of highest level of NVQ across immigrants and natives, separately by gender.[11] The top panel refers to men and the lower panel to women. The final column shows that 9.7 percent of men in the sample have no NVQ compared to 10.1 percent of women. There are more working women with a higher degree (5.1 % with NVQ level 5) and a first degree or equivalent (27.9 % with NVQ level 4) as highest, compared to men (4.9 % with NVQ level 5 and 23 % with NVQ level 4).

In terms of British qualifications, Table 1 also shows that immigrants are, on average, more likely to have either no qualifications (13.5 % for men) or be graduates (42.8 % of men have NVQ level 4 or above) compared to natives (9.5 and 27.3 respectively for men). Distinguishing between labour market entrants and immigrants that arrived in the UK before they left full time education (education entrants) shows that it is the former that are the most over represented in terms of the extremes of the NVQ distribution.[12] At the lower end of the qualification distribution, education entrants are more similar to natives since only 7.6 percent of men and 5.7 percent of women have no qualifications. In terms of graduates, education and labour market entrants are similar to each other. Both labour market and education entrants exhibit higher percentages of graduates than natives, since 43.9 (45.3) percent of education entrant men (women) are graduates whilst

40 (52) percent of labour market entrant men (women) are graduates compared to 27.3 (32) percent for male (female) natives.

Table 2 compares highest NVQ for immigrants and natives, distinguishing between ethnic group and gender. The first row in panel (i) shows that there are 4.6 percent of white natives with a higher degree (NVQ level 5) and 22.6 percent with a first degree or equivalent (NVQ level 4). Comparing across other ethnic groups shows that percentages of graduate male and female workers are generally higher across minority ethnic groups, with Black Caribbean/Other men being the one exception (19.9 % and 2.6 % for NVQ levels 4 and 5 respectively). Contrariwise, most UK born minority ethnic groups are under represented in the no NVQ category compared to whites (9.5 % and 10.2 % for white native men and women). Black African and Indian workers stand out as exceptionally well educated groups. Over 50 percent of Black African workers, whilst around 47 percent of Indian workers, are graduates. One explanation is that greater investments in higher levels of education are a consequence of disproportionately higher unemployment propensities experienced by non-whites during the early 1990s recession (see Lindley 2005).

The story for immigrants is similar to that for the native born non-white groups, since most immigrant groups exhibit larger percentages of graduates compared to white natives (27.16% and 31.9 % for men and women), with Black Caribbean men (20.1 %) and Pakistani/Bangladeshi women (31.6 %) being the only exceptions. Again, Black African and Indian workers stand out as being exceptionally well educated, whilst Pakistani/Bangladeshi men (32.9 %) and Indian women (22.7 %) stand out within the no NVQ group. Table 2 also supports the need for the distinction between White natives

and White immigrants since the latter tend to have much higher qualification levels, on average compared to White natives.

Given that most immigrant and minority ethnic groups are better educated compared to White natives on average (in terms of their NVQ), it might be interesting to see whether they are also more or less likely to be over-educated. The existing literature provides a number of approaches. Firstly, there is the `objective' measure based on the Dictionary of Titles definition of a graduate job. This measure is based on the level of education required for a particular occupation, but as shown by Van der Velden & Van Smoorenburg (2000) it may overestimate the incidence of over-education because it does not cover the full range of jobs in a particular occupation and some job evaluations may have grown obsolete. Secondly, there is the `subjective' definition of over-education which is based on whether a respondent feels that their job is commensurate with their qualification level. This measure is not possible using the QLFS since this question is not contained in the survey.[13] Finally, there is the `distributional' measure of over-education which is usually defined as possessing some level of education above the mean or mode occupational level of education. Following Battu and Sloane (2004), this paper adopts this distributional approach. A comparison is made between the occupational mode highest NVQ to that highest NVQ held by the respondent.[14] That is, `required' education is equal to the mode NVQ qualification for that individual's three-digit occupation, 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 having highest NVQ level above the required

level. Contrariwise under-education is defined as having a NVQ level below the required level.

The distributional measure has its drawbacks. A more accurate measure for over-education could be attained if occupation data were available at a more detailed level than the 3 digit. The main advantage of these data however, is that they are drawn from one of the only UK data sets that allow the comparison of immigrants with UK qualifications to natives, whilst making the distinction between minority ethnic groups.

Table 3 shows the percentage of educational mismatch for immigrants and natives again by ethnicity. The final rows show that male natives tend to have the required level of schooling (48.4 %) compared to being under-educated (29.1 %) or being over-educated (22.5 %). Compared to men, there are more females over-educated (28.7 %) and with required education (50.6 %) and fewer with under-education (20.6 %). However, we might expect some degree of gender difference given that women are over represented in lower NVQ level occupations (see Dex and Lindley 2007). Amongst the British born, most minority ethnic groups are more likely to be over-educated compared to whites, with Black Caribbean/other workers being the only exception.

Clearly, immigrants are more likely to be over-educated (27.3 % compared to 22.5 % for native men) and less likely to be have the required highest qualification or be under-educated compared to white natives. Furthermore, immigrants are generally more likely to be over-educated than their own ethnic native-born counterparts, with Pakistani/Bangladeshis, Indian women and Black Caribbean/other women being exceptions. Those which stand out in terms of over-education are Black African immigrants and natives (men and women), Indian men, Indian UK born women,

Pakistani/Bangladeshi UK born men, Pakistani/Bangladeshi women and `other non-white' UK born and immigrant workers. These results are consistent with Dex and Lindley (2007) who found higher percentages of over-education for Black African, Chinese and Other non-white groups.

3. The econometric modelling

Following the existing literature on mismatch between education and occupation, the econometric model incorporates a three-regime ordered logit model.[15] The base category consists of full time workers who have the required highest qualification level for their own occupation. That is their actual highest qualification is equal to the modal highest qualification level for their own three-digit occupation of employment. As shown in Table 3, there are some workers who have a higher NVQ level qualification as their highest (over-educated) and workers who have a lower NVQ level qualification as their highest (under-educated), than the mode 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 under-educated required and over-educated respectively. A typical set of controls thought to influence the likelihood of over-education are included (region of residence, marital status, presence of children, age and size of firm), as well as ethnicity and immigrant assimilation variables such as arrival cohort and years since migration.[16] To control for English language proficiency, a binary variable is included indicating whether English is generally spoken in the country of origin.[17] Also included is the national unemployment rate at the time of entry into the UK

labour market in order to identify any economic scarring effects on the incidence of over and under required education. For natives and immigrants who arrived in the UK as children or students (education entrants) this is the unemployment rate for the year the worker left full time education. For immigrants who arrived directly into the UK labour market (labour market entrants) this is the unemployment rate during the year of arrival.

To compare the likelihood of required, under and over-education between immigrants and natives the ordered logit model is first estimated on a pooled sample of immigrants and natives, although separately for men and women. In this pooled model assimilation effects can be measured using years since migration since cohort quality is controlled for using a number of cohort dummies (where the default category is UK born).

Following this, separate equations are estimated for immigrants and natives so that parameters can be compared across immigrant groups. However, for immigrants there is now a linear relationship between survey year (Y), arrival cohort (C) and years since migration (M), whereby Y=C+M. Hence the years since migration variable must now be excluded from the separate immigrant equation. In the separate native/immigrant equations 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.

To assess the effect of education on earnings, two competing specifications are estimated for the earnings equation. First, the following earnings equation is estimated:

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

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, marital status, age, ethnicity, English speaking country of origin and immigrant arrival cohorts).[18] This is a variation of 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 mode highest qualification per three digit occupation of employment) denoted here as S^R, as well as binary variables to measure over-required S^O and under-required S^U education.

Hence γ_1 in equation (1) measures the return to those who have the required education for their occupation. In addition, γ_2 measures the return to those whose highest NVQ level is above the required education level in their occupation (over-educated). So, if $\gamma_2 > 0$ this suggests that an over-educated worker will exhibit a higher return than a worker with the required education 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 education but who is efficiently matched into an appropriate occupation. Similarly, γ_3 measures the return to being under-educated. 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 NVQ as themselves).[19]

In the second specification for the earnings equation, over-required S^O and under-required S^U education are replaced with five highest NVQ dummies in equation (1). In this `hedonic' model the coefficient on required schooling now measures the returns to the occupational skill level over and above the returns to highest qualifications. All earnings equations are estimated separately for white natives, white immigrants, non-

white natives and also non-white immigrants, which allows a comparison of the coefficients across immigrant groups. Finally, separate models are estimated for both South Asian and Black workers, although sample sizes would not allow further distinction within these composite groups. Again all earnings equations are estimated separately for men and women.

A final word on the specification of the wage equations, given that the ORU variables use occupational status, is that it is not possible to correct for employment selection bias.[20] However, all the results presented are robust to employment selection for the hedonic specification.[21] Similarly, it is not possible to control for endogenous education choices using these data. The QLFS is a cross-section survey of adults and there are no retrospective questions asking about childhood, family background, number of siblings or any potential instrument for education.[22] However, the clear advantage of using the QLFS is its size. The QLFS is the only UK survey to provide adequate sample sizes for analyzing immigrant and ethnic minority groups. Furthermore, the sampling design implies excellent coverage for immigrants since it uses stratification and avoids clustering, thus providing good geographical reporting. This is important because many immigrants are concentrated in specific areas and a clustered sampling design could well omit coverage of key immigrant conurbations.

4. The determinants of required, over and under-education.

The key marginal effects for the ordered logits are contained in Tables 4 and 5, for men and women separately.[23] Table 4 estimates a single equation whilst Table 5 estimates the model separately for immigrants and natives. The default category consists

of white natives with no qualifications, 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.

Table 4 clearly shows that only Black African and Other non-whites, as well as Indian men are more likely to be over-educated relative to White natives. The largest effect is found for Black African men who are 17 percentage points more likely to be over-educated than White men. Conditioning on all other socio-economic variables, including ethnicity, only those immigrants that arrived between 1990-9 are more likely to be over-educated relative to the British born. The `years since migration' variable is generally insignificant which suggests that immigrant differences are generally not eroded over time.[24] Hence there is some unobservable difference in the 1990s immigration cohort compared to the other cohorts, over and above the controls in the model. This may reflect changes in immigration brought about by enlargement of the European Union which led to more low ability workers coming to the UK.[25] 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, most non-whites (except Caribbean's and Pakistani/Bangladeshis) are significantly less likely to be under-educated compared to Whites. The more recent immigration cohorts (1990-2003) exhibit lower incidence of being under-educated, compared to natives and the `years since migration' variable is either very small or not statistically significant. In summary, Table 4 suggests ethnic differences are apparent for Black Africans, Other non-whites and Indian men, but also

that immigrants who arrived during the 1990s are more likely to experience over-education.

Turning now to the separate equation estimates for immigrants and natives, contained in Table 5.[26] Men are detailed in the first panel and therefore are discussed first. For natives, most minority ethnic men are more likely to be over-educated compared to Whites, with the largest is for Black African men (16.2 percentage points) and the only exception being for Black Caribbean men (2.2 percentage points less likely to be over-educated).

For immigrants, where `White immigrant' is now the comparison group, Black African men are 15.2 percentage points and Other non-whites are 0.5 percentage points more likely, whilst Pakistani/Bangladeshi men are 0.3 percentage points less likely to be over-educated. Interestingly there is no evidence that coming from an English speaking country reduces the likelihood of over-education which is consistent with the findings of Battu and Sloane (2004).

The immigrant arrival cohort variables are positive and significant which supports the existence of detrimental immigrant cohort quality effects to those who arrived later than 1959, with much larger differences to those who arrived after 1990**.** To say something about assimilation towards natives, one can compare the effect of age across immigrant and native groups. Immigrants demonstrate a slightly steeper profile than natives which provides little evidence of economic assimilation effects. Immigrants that arrived into the UK education system are 8.7 percentage points more likely to be over-educated compared to those who arrived directly into the labour market, whilst arriving in a period of high unemployment has a positive effect of around 1.3 percentage points.

For under-education, most non-white native men are less likely to be under-educated compared to white native men, with Black Caribbean/Other men being 2.7 percentage points more likely. For immigrants, Black African men are 11 percentage points, whilst Other non-whites are 4 percentage points less likely to be under-educated, whilst Pakistani/Bangladeshi men are 3.5 percentage points more likely to be under-educated, relative to white immigrants. The arrival cohort variables show both improvements over time amongst immigrants but fail to show assimilation effects towards natives (given that immigrant age profiles are steeper than those for natives). Finally, immigrants that arrived into the UK education system are 8.9 percentage points less likely to be under-educated compared to those who arrived into the labour market.

For women, Indian and Pakistani/Bangladeshi's are 11.7 and 7.5 percentage points more likely to be over-educated compared to White British born women, whilst Black Caribbean immigrant women are 7.2 percentage points less likely to be over-educated than White immigrants. Unlike men, immigrant arrival cohort effects are generally insignificant in explaining over-education and there is also little evidence of assimilation. For under-education, there are significant ethnicity effects (positive for Caribbean immigrant women), as well as immigrant cohort effects that again suggest detrimental effects for those who arrived more recently**,** compared to those who arrived before 1959. Being an education entrant increases (decreases) the likelihood of over-education (under-education) but there is no evidence of unemployment scarring effects.

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

To assess the effect of education on pay, both the `ORU' and the `hedonic' earnings specifications are estimated, as described in section 3. The ORU measures human capital through required education (mode NVQ at the three-digit occupation level), as well as over-required education and under-required education binary variables. The hedonic model contains five highest NVQ binary variables, where no qualifications is the default category. The equations are estimated separately for white natives, non-white natives, South Asian natives (Indian and Pakistani), Black natives (Black Caribbean/other and African), white immigrants, non-white immigrants, South Asian immigrants and Black immigrants.[27] The results for the `Other' non-white group are not presented because this group is considered too heterogeneous to provide sensible analyses.

The default category consists of unmarried, 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 extra defaults of being Caribbean in the non-white equations, being Black Caribbean in the Black equations and being Indian in the South Asian equations, as well as arriving in the UK before 1959 and not being from an English speaking country of origin in the immigrant equations.

The estimates for immigrants and natives are presented in Table 6. Again only key results concerning returns to education and English language are discussed.[28] There is a positive return for English spoken in the country of origin of around 2 percent for white men and women, although interestingly this effect is not statistically significant for non-white immigrants. This again may provide some evidence of increased immigration from largely White non-English speaking countries such as those in the European Union.

In the ORU for men, over and above all other characteristics (including ethnicity and English spoken in the country of origin) the premium to required education is higher for South Asian immigrants at 0.204 log points (22.6%) and white immigrants at 0.180 log points (19.7%), whilst this is lower for Black natives at 0.158 log points (17.1%), compared to white natives of 0.171 log points (18.5%).[29] The premium for the over-educated is positive and significant across all groups (except South Asian natives), although the coefficients are smaller than for required education in all cases as one would 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 education be equalized.

Comparing across groups, the over-education return is largest for white natives at 0.117 log points (12.4%) which is consistent with Battu and Sloane (2004) who found around 13 percent for whites using a different UK data set.[30] The return is smaller for the composite group of non-white immigrants (11.6%) and non-white natives (10.1%) but is smaller still for white immigrants (8.5%) and also when further distinction is made between Black and South Asian immigrants (both around 8%). There is no significant over-education premium for South Asian native men.

Over-education penalties are given by the difference between the required education and over-education returns, since this provides the benefit of attaining a match between actual highest qualifications held and those required in the occupation of employment. These penalties are largest for South Asian natives (19.7%), followed by South Asian immigrants (13.2%), white immigrants (10.4%), white natives (5.5%), Black immigrants (4.3%) and are the smallest for Black natives (3.7%).[31] The negative earnings effect

associated with being under-educated ranges between 1 and 2.3 percent across all groups, where these are smaller than the returns for required education for all groups (except South Asian immigrants) which is in keeping with the consensus in the existing literature (see Hartog 2000).

In the hedonic model, the return to occupational skill level (over and above highest qualifications) is noticeably larger for South Asians (12.6% for natives and 11.1% for immigrants) and also White immigrants (11.7%), whilst the return to having a higher degree (NVQ level 5) is also much lower for South Asian natives (40%) and White immigrants (45.8%) relative to the default of no qualifications. This supports the ORU results since South Asian natives and White immigrants exhibit a greater return to working in a highly skilled occupation, and a smaller return on graduate qualifications (NVQ levels 4 and 5) compared to the other groups. Interestingly, South Asian immigrants have the most to gain from investing in higher degree qualifications (NVQ level 5) because they receive 0.624 log points (86.6%) higher earnings compared to having no qualifications. The returns on higher degrees are much lower for white natives of 0.424 log points (52.8%) for NVQ level 5. Some interesting differences are shown between the return to first degrees (NVQ level 4) since South Asian natives and Black immigrants both receive noticeably lower returns compared to the other groups.

For women, the returns to required education are generally higher compared to comparative figures for men (with South Asian natives at 15.1%, and the composite non-white group at 17.8% being the exceptions). White native women have the largest required premium (24.6%), followed by South Asian immigrants (23.9%), white immigrants (21.8%), Black natives (17.4.9%), Black immigrants (16.9%) and South

Asian natives (15.1%). The pattern for over-education penalties differs to that for men since it is Black natives (17.3%) that exhibit the highest difference between required and over education, given that there is no significant over-education premium for this group. This is followed by white natives (12.2%), South Asian immigrants (8.4%), Black immigrants (6.1%) and South Asian natives (6.1%).

In terms of gender differences, Black native women exhibit higher over-education penalties compared to their male counterparts (3.7% for men compared to 17.3% for women). White native women also show large gender differences (5.5% for men compared to 12.2% for women). Conversely, female South Asian immigrants and natives, as well as Black immigrants exhibit lower over-education penalties compared to their male counterparts (South Asian immigrants penalties are 13.2% for men compared to 8.4 percent for women). This suggests the detrimental gender differences observed for White women do not extend across all ethnic groups, despite South Asian women showing similar percentages of graduates compared to South Asian men in Table 2 and exhibiting much higher rates of over-education in Table 3.

The hedonic model shows similar returns to working in a highly skilled occupation for white natives (12.8%), Black natives (11.5%) and white immigrants (12%) and South Asian immigrants (14.2%), but lower returns for Black immigrants (8.9%) and South Asian natives (7.1%). Non-white natives also appear to suffer lower returns to graduate highest qualifications since NVQ level 4 earn 32.9 percent and NVQ level 5 earn 39.8 percent more than those with no qualifications, compared to white natives (49.4 % and 67.7 % respectively). This result holds across separate South Asian and Black native equations. White and non-white immigrants appear somewhere in between these two

extremes but unlike men, ethnic differences for female immigrants are not overly apparent.

In short, conditioning on socio-economic characteristics shows that some non-white natives (all men, as well as Indian and Pakistani/Bangladeshi women) and Black African and Other non-white immigrants are more likely to exhibit over-education, compared to White natives. There is little evidence that this can be attributed to English language problems for non-whites. Moreover earnings penalties associated with over-education are higher for male non-white natives and all immigrants, and returns to highest UK qualifications are often lower, relative to their native born counterparts. This may well indicate some degree of racial disadvantage, although care should be taken in attributing this to racial discrimination, given that ethnic differences exist in the quality of NVQ level 2 (Battacharya et al 2006) and NVQ level 4 education (Jones and Elias 2005), where this quality is particularly low for Black Africans .

6. Conclusions

This paper shows that immigrants are better educated on average compared to native born workers, in terms of highest British NVQ levels. Consequently, the paper investigates 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. The data allow the distinction between immigrant groups whilst controlling for important ethnic differences. Secondly, the paper compares earnings premiums associated with required, over and under-education, as well as occupational skill levels and returns to highest NVQ levels, for separate ethnic groups within our native born and immigrant set.

The results in this paper show that ceteris paribus, all non-white native men (with the exception of Black Caribbean natives), Black African immigrant men, Other non-white immigrant men, as well as Indian and Pakistani native women are more likely to be over-educated compared to white natives. Estimates of required, under and over-education suggest that the most recent immigration cohorts are more likely to experience over-education, whereby there is little evidence of economic assimilation effects. This is perhaps as a consequence European Union enlargement reducing the average ability level of more recent immigration cohorts.

In terms of the returns to education and the effect of over-education on earnings, South Asian men (immigrants and natives), White immigrant men , Black native women, White native women and White immigrant women all exhibit high penalties in terms of the loss associated from not being matched into an appropriate occupation. The observation of higher over-education penalties for White UK born women relative to those for men, although applicable also to Black natives, does not hold for South Asian groups or Black migrants. The hedonic earnings equations show that graduate returns are lower for South Asian native men, White immigrant men, Black immigrants (for a first degree) and non-white native women. This may suggest that non-white and immigrant groups could achieve higher earnings should they attain a successful match into an occupation appropriate to their UK highest education level. However, we cannot attribute such observed disadvantage directly to racial discrimination, given that the empirical evidence also suggests education quality differences exist to these disadvantaged minority ethnic groups.

Finally, the results here show large returns to occupational skills for South Asian men (immigrants and natives) and White immigrant men, as well as Black native women and White immigrant women, over and above the returns to qualifications. In terms of policy, this suggests that minority ethnic groups and immigrants (including Whites) would benefit more than native born workers if their university or college UK education was accompanied with occupational specific training for jobs commensurate with their education level.

REFERENCES

Battu et al (2000), Over-Education and Crowding Out in Britain, in L Boghans and A. de Grip (eds), *The Overeducated Worker*, Edward Elgar, Cheltenham, 157-174.

Battu H. and Sloane, P.J. (2004), Over-Education and Ethnic Minorities in Britain, *The Manchester School*, 72, No 4, 535-559.

Bhattacharyya,G. Ison,L. and Blair,M. (2003) *Minority ethnic attainment and participation in education and training: The evidence*, Research Topic Paper RTP01-03, London: Department for Education and Skills.

Bell, B.D. (1997), The Performance of Immigrants in the United Kingdom: Evidence from the GHS, *Economic Journal*, 107, 333-345.

Berthoud, R. and Beishon, S. (1997), "People, Families and Households; in T. Modood *et al*, *Ethnic Minorities in Britain: Diversity and Disadvantage*, Policy Studies Institute, London.

Blackaby, D.H., D.G. Leslie, P.D. Murphy and N.C. O'Leary (2002), White/Ethnic Minority Earnings and Employment Differentials in Britain: Evidence from the LFS, *Oxford Economic Papers*, 54, 270-279.

Chevalier,A. (2003) 'Measuring over education', *Economica* 70 (3) pp.509-31.

Clark K. and Lindley, J. (2005), Immigrant Labour Market Assimilation and Arrival Effects: Evidence from the Labour Force Survey, *University of Sheffield,* Department of Economics working paper 2005/05.

Dearden, L. (1999a) `The effects of Families and Ability on Men's Education and Earnings in Britain' *Labour Economics*, Vol. 6, pp. 551-567.

Dearden, L. (1999b) `Qualifications and Earnings in Britain: How Reliable are Conventional OLS estimates of the Returns to Education, IFS Working Paper No 99/7.

Dolton and Silles (2001), Overeducation in the UK Graduate Labour Market: Some evidence using Alumni data*, CEE discussion Paper 9, London School of Economics*.

Dex and Lindley (2007), Labour market job matching for UK minority ethnic groups, University of Sheffield, Department of Economics, Sheffield Economics Research Paper Series 2007003.

Dolton and Vignoles (2000), Incidence and Effects of Overeducation in the UK Graduate Labour Market*, Economics of Education Review*, 19, 2, 179-198.

Groeneveld S and Hartog J (2004) Overeducation, wages and promotions within the firm *Labour economics*, 11, 701-14

Groot and Maassen van den Brink (2000) Overeducation in the Labour Market: A Meta Analysis, in: H. Oosterbeek ed. *The Economics of Over- and Underschooling*. Special issue of *Economics of Education Review*, 19, 2, 149-158.

Hartog, J. (1997), On the returns to education: wandering along the hills of our land, Paper presented at Applied Econometrics Association, Maastricht.

Hartog, J. (2000), Over-education and Earnings: Where Are We, Where should we Go? *Economics of Education Review*, 19, 131-147.

Holdsworth, C. (1995), "Minimal Household Units", *SARs Newsletter,* No 5, pp. 3-10.

Holdsworth, C. and Dale, A. (1999) Ethnic homogeneity and family formation: Evidence from the 1991 Household SAR, *University of Manchester, CCSR Occasional Paper No 7*.

Jones,P. and Elias,P. (2005) *Science, engineering and technology and the UK's ethnic minority population*: A Report for the Royal Society, Coventry: Warwick Institute for Employment Research.

Lindley, J.K., (2005), Explaining Ethnic Unemployment and Economic Activity: Evidence from the Labour Force Survey, *Bulletin of Economic Research,* 57.

Lindley, J. Dale, A. and Dex, S. (2006), Ethnic differences in women's labour force participation: The role of qualifications, *Oxford Economic Papers*, Vol. 58-2, 351-78.

Sicherman (1991) Overeducation in the Labour Market, *Journal of Labour Economics*, 9, No 2, 101-122.

Sloane, P, Battu, H. and Seaman, P. (1999), Over-education, Under-education and the British Labour Market, *Applied Economics*, 31, No 11, 1437-1454.

United Nations High Commissioner for Refugees (2001) *Asylum Applications in Europe*, http://www.unhcr.ch/statist/00asylall/00asylall.pdf

Van der Velden, R., & Van Smoorenburg, M. (2000) *The measurement of overeducation and undereducation: self-report vs. job-analyst method*, Paris: Lasmas-ldL CNRS IRESCO, Serie Séminaire 00-2.

Table 1. Highest NVQ level Qualification for Immigrants and Natives (percent).

Panel (i) Men

	UK Born	Immigrants	Education Entrants [a]	Labour Market Entrants [b]	
No NVQ	9.46	13.53	7.62	23.71	9.66
NVQ1	12.75	7.07	9.95	2.11	12.47
NVQ2	17.74	11.77	14.42	7.19	17.45
NVQ3	32.79	25.27	24.15	27.20	32.43
NVQ4	22.69	29.81	32.15	25.79	23.03
NVQ5	4.56	12.55	11.71	14.0	4.95
Sample N	155,018	7879	4986	2893	162,897

Panel (ii) Women

	UK Born	Immigrants	Education Entrants [a]	Labour Market Entrants [b]	
No NVQ	10.07	10.96	5.72	18.06	10.12
NVQ1	11.41	8.60	11.35	4.86	11.24
NVQ2	28.48	16.43	21.28	9.84	27.77
NVQ3	18.01	16.04	16.40	15.56	17.89
NVQ4	27.28	37.19	35.46	39.54	27.87
NVQ5	4.75	10.79	9.79	12.15	5.10
Sample N	95,724	6015	3463	2552	101,739

Notes: Data are unweighted and show column percentages.
a Where these immigrants arrived in the UK before they left full time education.
b Where these immigrants arrived in the UK during or after they left full time education.

Table 2. Highest NVQ level Qualification for British and Foreign Born by Ethnic Group (percent).

Panel (i) Men

	No NVQ	NVQ1	NVQ2	NVQ3	NVQ4	NVQ5	Total
British Born							
White	9.50	12.77	17.68	32.89	22.61	4.55	15,3068
Black Car/other	6.92	12.97	27.95	29.68	19.88	2.59	694
African	0.86	12.07	7.76	25.86	43.97	9.48	116
Indian	4.81	7.22	21.23	19.26	40.04	7.44	457
Pakistani/Bangladeshi	9.21	14.04	17.54	21.05	33.33	4.82	228
Other	7.03	10.77	22.42	25.05	26.37	8.35	455
Total	9.46	12.75	17.74	32.79	22.69	4.56	155,018
Immigrants							
White	10.54	7.15	12.37	28.30	29.57	12.07	4657
Black Car/other	23.74	7.99	13.47	34.70	15.98	4.11	438
African	5.57	5.9	7.87	20.66	41.97	18.03	305
Indian	16.34	6.98	11.13	19.17	33.83	12.54	1,132
Pakistani/Bangladeshi	32.96	9.12	12.85	15.27	22.35	7.45	537
Other	11.36	5.31	9.01	19.63	33.46	21.23	810
Total	13.53	7.07	11.77	25.27	29.81	12.55	7,879

Panel (ii) Women

	No NVQ	NVQ1	NVQ2	NVQ3	NVQ4	NVQ5	Total
British Born							
White	10.21	11.49	28.52	17.94	27.14	4.71	94,019
Black Car/other	2.90	7.47	33.75	21.44	30.01	4.43	723
African	2.38	9.52	16.67	16.67	41.67	13.10	84
Indian	2.34	6.23	18.18	23.64	41.56	8.05	385
Pakistani/Bangladeshi	4.64	5.96	27.15	23.18	30.46	8.61	151
Other	1.38	6.91	22.93	22.38	38.12	8.29	362
Total	10.07	11.41	28.48	18.01	27.78	4.75	95,724
Immigrants							
White	8.56	8.32	16.03	18.30	36.77	12.01	3737
Black Car/other	16.81	11.49	20.43	10.64	36.60	4.04	470
African	7.33	9.52	13.55	14.29	45.05	10.26	273
Indian	22.68	8.73	19.30	11.97	28.87	8.45	710
Pakistani/Bangladeshi	13.16	12.50	23.03	19.74	23.68	7.89	152
Other	8.77	6.69	12.48	11.44	48.59	12.04	673
Total	10.96	8.60	16.43	16.04	37.19	10.79	6015

Notes: Data are unweighted and show row percentages.

Table 3. Required, Over and Under-Education (percent).

Panel (i)Men

	Over-Educated		Required		Under-Educated	
	Natives	**Immigrants**	**Natives**	**Immigrants**	**Natives**	**Immigrants**
White	22.47	25.96	48.46	47.31	29.08	26.73
Black Car/other	20.03	23.74	47.26	48.63	32.71	27.63
African	41.38	45.90	37.93	38.36	20.69	15.74
Indian	26.04	28.18	52.30	45.14	21.66	26.68
Pakistani/Bangladeshi	28.51	21.23	44.74	45.44	26.75	33.33
Other	28.57	32.59	41.54	46.30	29.89	21.11
Total	22.51	27.29	48.43	46.49	29.06	26.22

Panel (ii) Women

	Over-Educated		Required		Under-Educated	
	Natives	**Immigrants**	**Natives**	**Immigrants**	**Natives**	**Immigrants**
White	28.93	33.53	50.71	48.73	20.66	17.74
Black Car/other	28.63	25.11	50.76	53.83	20.61	21.06
African	38.10	40.66	45.24	44.32	16.67	15.02
Indian	43.90	29.72	39.48	54.79	16.62	15.49
Pakistani/Bangladeshi	36.42	33.55	49.67	44.74	13.91	21.71
Other	33.70	33.73	47.24	51.11	19.06	15.16
Total	28.73	32.77	50.64	49.81	20.62	17.42

Notes: Data are unweighted and show row percentages separately for immigrants and natives.

Table 4. Single Equation Ordered Logit Key Marginal Effects for Over and Under-education. (Base category is required education).

	Men				Women			
	Over-Education		**Under-Education**		**Over-Education**		**Under-Education**	
	ME	**SE**	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Caribbean	-0.0138	0.0095	0.0168	0.0121	-0.0172	0.0113	0.0141	0.0096
African	0.1671*	0.0231	-0.1342*	0.0126	0.0802*	0.0245	-0.0527*	0.0134
Indian	0.0346*	0.0988	-0.0372*	0.0097	0.0459	0.0136	-0.0325*	0.0087
PB	-0.0056	0.0113	0.0066	0.0149	0.0332	0.0242	-0.0242	0.0163
Other Eth	0.0520*	0.0113	-0.0536*	0.0102	0.0337*	0.0136	-0.0245*	0.0091
Arrived <1959[a]	-0.0532	0.0349	0.0735	0.0566	-0.0462	0.0474	0.0410	0.0475
Arrived 1960-9	-0.0426	0.0334	0.0568	0.0504	-0.0416	0.0358	0.0364	0.0348
Arrived 1970-9	-00262	0.0307	0.0332	0.0420	-0.0173	0.0288	0.0142	0.0247
Arrived 1980-9	0.0042	0.0241	-0.0049	0.0277	0.0296	0.0211	-0.0217	0.0145
Arrived 1990-9	0.0332*	0.0159	-0.0357*	0.0157	0.0158	0.0154	-0.0120	0.0112
Arrived 2000-3	0.0488	0.0334	-0.0506**	0.0304	-0.0339	0.0352	0.0291	0.0330
YSM	0.0026	0.0020	-0.0031	0.0024	0.0023**	0.0012	-0.0018**	0.0009
YSM sq	-0.00002	0.00003	0.00003	0.00004	-1.14e-06**	0.00001	9.00e-07**	0.00001
U rate	0.0050*	0.00038	-0.0059*	0.0045	-0.0008	0.0006	0.00067	0.0045
N	162897				101739			

Notes: QLFS 1993-2003, data are unweighted.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
a denotes arrived in the UK before or during 1959.
The dependent variable takes the value 0 for under-educated, 1 for matched and 2 for over-educated. 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 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 5. Separate Immigrant/Native Ordered Logit Marginal Effects for Over and Under-Education. (Base category is required education).

Panel i) Men

	Over-Education				Under-Education			
	Natives		**Immigrants**		**Natives**		**Immigrants**	
	ME	**SE**	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Caribbean	-0.0216**	0.0015	-0.0078	0.0195	0.0273**	0.0156	0.0077	0.0196
African	0.1621*	0.0475	0.1517*	0.0289	-0.1323*	0.2392	-0.1101*	0.0157
Indian	0.0769*	0.0184	0.0047	0.0133	-0.0753*	0.0147	-0.0045	0.0127
PB	0.0739*	0.0264	-0.0032*	0.0166	-0.0728*	0.0215	0.0347**	0.0186
Other Eth	0.0386*	0.0174	0.0492*	0.0159	-0.0414*	0.0169	-0.0437*	0.0128
Arrived 1960-9	-	-	0.0271*	0.0159	-	-	-0.0256**	0.0146
Arrived 1970-9	-	-	0.0577*	0.0201	-	-	-0.0525*	0.0171
Arrived 1980-9	-	-	0.0959*	0.0269	-	-	-0.0806*	0.0195
Arrived 1990-9	-	-	0.1555*	0.0322	-	-	-0.1183*	0.0193
Arrived 2000-3	-	-	0.2142*	0.0539	-	-	-0.1386*	0.0233
Age	0.0137*	0.0052	0.0232*	0.0029	-0.0163*	0.0006	-0.0225*	0.0028
Age sq	-0.0002*	0.00001	-0.0002*	0.00004	0.00018*	0.00001	0.0002*	0.00003
Speak Eng	-	-	0.0095	0.0095	-	-	-0.0092	0.0091
Edu entrant	-	-	0.0867*	0.0123	-	-	-0.0894*	0.0135
U rate	0.0046*	0.0039	0.0131*	0.0019	-0.0055*	0.0047	-0.0126*	0.0018
N	**155018**		**7879**		**155018**		**7879**	

Panel ii) Women

	Over-Education				Under-Education			
	Natives		**Immigrants**		**Natives**		**Immigrants**	
	ME	**SE**	**ME**	**SE**	**ME**	**SE**	**ME**	**SE**
Caribbean	-0.0063	0.0143	-0.0722*	0.0206	0.0051	0.0118	0.0541*	0.0179
African	0.0785	0.0485	0.0331	0.0297	-0.0523**	0.0270	-0.0199	0.0167
Indian	0.1169*	0.0239	-0.0116	0.0179	-0.0723*	0.0115	0.0076	0.0121
PB	0.0750*	0.0355	-0.001	0.0361	-0.0504*	0.0201	0.0007	0.0233
Other Eth	0.0322	0.0218	0.0051	0.0182	-0.0238	0.0149	-0.0032	0.0115
Arrived 1960-9	-	-	0.0218	0.0216	-	-	-0.0137	0.0133
Arrived 1970-9	-	-	0.0521	0.0259	-	-	-0.318*	0.0150
Arrived 1980-9	-	-	0.0929	0.0341	-	-	-0.0527*	0.0171
Arrived 1990-9	-	-	0.0769	0.0371	-	-	-0.0443*	0.0191
Arrived 2000-3	-	-	0.0205	0.0562	-	-	-0.0126	0.0331
Age	0.0098*	0.0008	0.0174*	0.004	-0.0078*	0.0006	-0.0112*	0.0026
Age sq	-0.0002*	0.00001	-0.0002*	0.00005	0.0001*	0.00001	0.00013*	0.00003
Speak Eng	-	-	0.0204	0.0124	-	-	-0.0129**	0.0078
Edu entrant	-	-	0.0239	0.0164	-	-	-0.0155	0.0107
U rate	-0.0014*	0.0006	0.0025	0.0026	0.0011*	0.0005	-0.0016	0.0017
N	**95724**		**6015**		**95724**		**6015**	

Notes: QLFS 1993-2003 Data are unweighted.
* denotes significant at 5 percent level, whilst ** significant at the 10 percent level.
The dependent variable takes the value 0 for under-educated, 1 for matched and 2 for over-educated. 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.

Table 6. Key results for the effect of education on earnings.
Panel(i) Men

	Natives								Immigrants							
	White		All non-white		South Asian		Black		White		All non-white		South Asian		Black	
	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic	ORU	Hedonic
R education	0.171*	0.092*	0.167*	0.091*	0.180*	0.119*	0.158*	0.088*	0.180*	0.110*	0.192*	0.097*	0.204*	0.105*	0.126*	0.067*
	(0.0009)	(0.0010)	(0.0096)	(0.0106)	(0.0182)	(0.0206)	(0.0147)	(0.0155)	(0.0056)	(0.0063)	(0.0065)	(0.0077)	(0.0091)	(0.0112)	(0.0132)	(0.0134)
O education	0.117*	-	0.096*	-	0.065	-	0.122*		0.081*	-	0.110*	-	0.080*	-	0.084*	-
	(0.0028)		(0.0245)		(0.0421)		(0.0392)		(0.0158)		(0.0198)		(0.0285)		(0.0393)	
U education	-0.139*	-	-0.114*	-	-0.093*	-	-0.091*		-0.149*	-	-0.201*	-	-0.231*	-	-0.104*	-
	(0.0025)		(0.0227)		(0.0420)		(0.0333)		(0.0151)		(0.0204)		(0.0279)		(0.0419)	
NVQ5	-	0.424*	-	0.454*	-	0.337*	-	0.534*	-	0.377*	-	0.595*	-	0.624*	-	0.483*
		(0.0064)		(0.0595)		(0.1026)		(0.1022)		(0.0309)		(0.0365)		(0.0535)		(0.0764)
NVQ4	-	0.351*	-	0.343*	-	0.285*	-	0.311*	-	0.330*	-	0.371*	-	0.395*	-	0.208*
		(0.0045)		(0.0455)		(0.0788)		(0.0723)		(0.0026)		(0.0300)		(0.0421)		(0.0608)
NVQ3	-	0.170*	-	0.162*	-	0.165*	-	0.132*	-	0.185*	-	0.168*	-	0.169*	-	0.058
		(0.0039)		(0.0433)		(0.0778)		(0.0669)		(0.0242)		(0.0281)		(0.0406)		(0.0514)
NVQ2	-	0.135*	-	0.143*	-	0.119	-	0.125**	-	0.411*	-	0.111*	-	0.145*	-	0.002
		(0.0043)		(0.0428)		(0.0762)		(0.0665)		(0.0277)		(0.0324)		(0.0438)		(0.0645)
NVQ1	-	0.069*	-	0.123*	-	0.098	-	0.126**	-	0.091*	-	0.119*	-	0.145*	-	-0.029
		(0.0044)		(0.0477)		(0.0854)		(0.0709)		(0.0312)		(0.0362)		(0.0486)		(0.0727)
Speak Eng	-	-	-	-	-		-		0.023**	0.016	-0.023	-0.015	-0.021	-0.007	-0.045	-0.054
									(0.0139)	(0.0138)	(0.0199)	(0.00197)	(0.0294)	(0.0290)	(0.0464)	(0.0452)
Const	-8.113*	-8.041*	-14.79*	-15.16*	-31.89*	-31.42*	-8.176	-8.49	-6.584	-6.012	-8.280	-6.648	-8.114	-7.199	-20.19	-20.96
	(0.6774)	(0.6745)	(6.607)	(6.541)	(11.47)	(11.42)	(10.089)	(9.985)	(5.107)	(5.082)	(7.493)	(7.357)	(11.15)	(11.01)	(14.11)	(13.75)
R Squared	0.4161	0.4245	0.4441	0.4558	0.460	0.4670	0.4092	0.4233	0.3851	0.3920	0.3887	0.4112	0.4665	0.4829	0.2570	0.2977
		153068		1950	685		810			4647		3222	1669		743	

Panel (ii) Women

	Natives								Immigrants							
	White		**All non-white**		**South Asian**		**Black**		**White**		**All non-white**		**South Asian**		**Black**	
	ORU	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**	**ORU**	**Hedonic**
R education	0.220*	0.120*	0.164*	0.089*	0.141*	0.069*	0.160*	0.109*	0.197*	0.114*	0.190*	0.118*	0.215*	0.133*	0.156*	0.086*
	(0.0011)	(0.0013)	(0.0102)	(0.0107)	(0.0809)	(0.0216)	(0.0135)	(0.0146)	(0.0056)	(0.0068)	(0.0064)	(0.0083)	(0.0108)	(0.0148)	(0.0098)	(0.0129)
O education	0.105*	-	0.079*	-	0.081**	-	0.0393	-	0.114*	-	0.094*	-	0.134*	-	0.097*	-
	(0.0031)		(0.0231)		(0.0450)		(0.0317)		(0.0160)		(0.0192)		(0.0315)		(0.0317)	
U education	-0.207*	-	-0.160*	-	-0.127*	-	-0.144*	-	-0.136*	-	-0.158*	-	-0.143*	-	-0.145*	-
	(0.0033)		(0.0264)		(0.0543)		(0.0352)		(0.0187)		(0.0227)		(0.0383)		(0.0347)	
NVQ5	-	0.517*	-	0.335*	-	0.227**	-	0.268*	-	0.419*	-	0.469*	-	0.489*	-	0.513*
		(0.0081)		(0.0747)		(0.1372)		(0.0861)		(0.0365)		(0.0442)		(0.0746)		(0.0743)
NVQ4	-	0.401*	-	0.284*	-	0.1869	-	0.284*	-	0.321*	-	0.285*	-	0.305*	-	0.264*
		(0.0057)		(0.0655)		(0.1215)		(0.0861)		(0.0312)		(0.0345)		(0.0594)		(0.0544)
NVQ3	-	0.214*	-	0.139*	-	0.003	-	0.209*	-	0.145*	-	0.183*	-	0.187*	-	0.141*
		(0.0054)		(0.0651)		(0.1196)		(0.0853)		(0.0300)		(0.0350)		(0.0573)		(0.0547)
NVQ2	-	0.154*	-	0.099	-	-0.040	-	0.177*	-	0.051*	-	0.124*	-	0.095**	-	0.134*
		(0.0049)		(0.0636)		(0.118)		(0.828)		(0.0302)		(0.0321)		(0.0516)		(0.0499)
NVQ1	-	0.028*	-	0.003	-	-0.012	-	0.032	-	0.067*	-	0.060**	-	0.072	-	0.0193
		(0.0055)		(0.0702)		(0.1313)		(0.0921)		(0.0335)		(0.0359)		(0.0567)		(0.0539)
Speak Eng	-	-	-	-	-	-	-	-	0.024	0.023	-0.0004	0.015	-0.002	0.006	-0.028	-0.018
									(0.1506)	(0.0149)	(0.0193)	(0.0272)	(0.0309)	(0.031)	(0.0401)	(0.0398)
Const	-8.205	0.120	-21.82	-20.91	-22.2**	18.39	17.57*	16.08**	-9.45**	-11.52*	-16.63*	-15.77*	-9.32	-8.103	-9.03	-9.99
	(0.4433)	(0.0013)	(6.478)	(6.461)	(12.95)	(12.93)	(8.891)	(8.91)	(5.591)	(5.524)	(7.732)	(7.665)	(13.14)	(13.07)	(11.93)	(11.69)
R Squared	0.4433	0.4522	0.3977	0.4027	0.4071	0.4178	0.3430	0.3465	0.4090	0.4252	0.4257	0.4336	0.5001	0.5053	0.3837	0.4001
		94019		1705	536		807			4647		2278	862		743	

Notes: QLFS 1993-2003. Data are unweighted. Standard errors are in parentheses.
The base model contains no controls. Unreported controls include survey year, marital status dummy, children dummy, 2 firm size dummies, 10 regional dummies, a manufacturing dummy, 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 in manufacturing. For the non-white equations there is the extra default of being Caribbean, whilst in the Black equations this is Black Caribbean and in the South Asian equation this is being Indian. For the immigrant equation there is the extra default of arriving in the UK before 1959.

Appendix.

Table A1. Sample Means for Labour Market Entrants by UK and Foreign Highest Qualifications.

	Men				Women			
	UK Highest		**Foreign Highest**		**UK Highest**		**Foreign Highest**	
	Mean	Std. Dev.	**Mean**	Std. Dev.	**Mean**	Std. Dev.	**Mean**	Std. Dev.
Gross Weekly Pay	**345.17**	192.19	**341.06**	195.79	**286.52**	146.66	**272.17**	154.74
Age	**43**	11	**39**	11	**41**	11	**37**	11
Years of schooling	**15**	4	**16**	4	**15**	3	**16**	3
Married	**77.08**	42.04	**72.05**	44.89	**61.83**	48.59	**59.99**	49.01
Firm size <25 emp	**25.48**	43.58	**26.08**	43.92	**23.12**	42.17	**26.83**	44.32
Firm Size 25-49	**12.20**	32.74	**12.66**	33.27	**12.93**	33.56	**14.11**	34.82
Firm Size >50	**62.32**	48.47	**61.25**	48.73	**63.95**	48.02	**59.06**	49.19
North	**1.45**	11.96	**1.16**	10.71	**0.90**	9.45	**0.75**	8.66
Yorkshire	**4.80**	21.39	**3.78**	19.09	**4.00**	19.59	**2.85**	16.63
North West	**6.19**	24.10	**3.53**	18.46	**3.80**	19.13	**3.02**	17.12
East Midlands	**5.15**	22.11	**3.38**	18.08	**4.74**	21.26	**2.56**	15.78
West Midlands	**8.19**	27.43	**8.58**	28.01	**6.03**	23.82	**4.41**	20.55
East Anglia	**3.70**	18.88	**3.83**	19.21	**3.21**	17.64	**3.19**	17.59
South East	**58.17**	49.34	**67.26**	46.94	**66.14**	47.33	**73.40**	44.20
South West	**5.32**	22.45	**4.04**	19.69	**4.86**	21.51	**4.24**	20.15
Wales	**1.87**	13.54	**0.91**	9.49	**1.68**	12.87	**1.10**	10.45
Scotland	**3.94**	19.46	**3.38**	18.08	**3.49**	18.35	**4.07**	19.75
Northern Ireland	**1.21**	10.93	**0.15**	3.89	**1.14**	10.60	**0.41**	6.36
Manufacturing sector	**23.51**	42.41	**20.99**	40.73	**13.79**	34.49	**14.23**	34.94
White	**50.67**	50.00	**54.99**	49.76	**56.07**	49.64	**64.34**	47.91
Back Caribbean/other	**6.74**	25.08	**2.93**	16.86	**7.09**	25.67	**3.08**	17.28
Black African	**7.09**	25.66	**4.74**	21.26	**7.52**	26.38	**4.24**	20.15
Indian	**14.73**	35.44	**16.35**	36.99	**12.19**	32.72	**13.36**	34.03
Pakistani/Bangladeshi	**6.15**	24.03	**7.67**	26.62	**1.33**	11.47	**1.05**	10.17
Other Non-white	**14.62**	35.34	**13.32**	33.99	**15.79**	36.47	**13.94**	34.64
Arr UK <1959	**7.33**	26.06	**3.03**	17.14	**3.57**	18.55	**1.86**	13.51
Arr UK 1960-69	**18.32**	38.69	**11.25**	31.61	**18.14**	38.54	**8.77**	28.29
Arr UK 1970-79	**17.91**	38.35	**12.36**	32.92	**22.22**	41.58	**15.56**	36.26
Arr UK 1980-89	**23.82**	42.60	**19.83**	39.88	**25.08**	43.35	**19.74**	39.82
Arr UK 1990-99	**28.24**	45.02	**44.60**	49.72	**27.12**	44.46	**44.13**	49.67
Arr UK <2000	**4.39**	20.49	**8.93**	28.53	**3.88**	19.31	**9.93**	29.92
Years since migration	**17**	13	**12**	12	**17**	12	**11**	11
N	2893		1982		2552		1722	

Table A2. Measurement of Highest National Vocational Qualifications from the UK QLFS.

	QLFS Variable Hiquap 1993-1995	QLFS Variable Hiqual 1996-2003
NVQ Level 5	(1) Higher degree	(1) Higher degree (2) NVQ level 5
NVQ Level 4	(2) First degree (3) Other degree (4) Diploma in higher education (5) HND-HNC, BTEC etc Higher (6) Teaching-further education (7) Teaching-secondary (8) Teaching-primary (9) Teaching-level not stated (10) Nursing (11) Other higher education degree (12) RSA higher diploma	(3) First degree (4) Other degree (5) NVQ level 4 (6) Diploma in higher education (7) HNC/HND, BTEC higher etc (8) Teaching, further education (9) Teaching, secondary (10) Teaching, primary (11) Teaching, level not stated (12) Nursing etc (13) RSA higher diploma (14) Other higher education below degree level
NVQ Level 3	(13) A level or equivalent (14) RSA advanced diploma (15) OND/ONC, BTEC etc National (16) City & Guilds advanced craft (17) Scottish 6th year certificate or (18) SCE higher or equivalent (19) AS level or equivalent (20) Trade apprenticeship	(15) NVQ level 3 (16) GNVQ advanced (17) A level or equivalent (18) RSA advanced diploma or certificate (19) OND/ONC, BTEC/SCOTVEC national (20) City and Guilds advanced craft (21) Scottish 6th year certificate (CSYS) (22) SCE higher or equivalent (23) AS level or equivalent (24) Trade apprenticeship
NVQ Level 2	(21) RSA diploma (22) City & Guilds craft (23) BTEC etc First or General diploma (24) O-level or equivalent	(25) NVQ level 2 or equivalent (26) GNVQ intermediate (27) RSA diploma (28) City and Guilds craft (29) BTEC/SCOTVEC first or general diploma (30) O level, GCSE grade A-C or equivalent
NVQ Level 1	(25) CSE below grade 1 (26) BTEC etc First or General certificate (27) YT/YTP certificate (28) SCOTVEC National certificate (29) RSA other (30) City & Guilds other (31) Other	(31) NVQ level 1 or equivalent (32) GNVQ/GSVQ foundation level (33) CSE below grade 1,GCSE below grade C (34) BTEC first or general certificate (35) SCOTVEC modules or equivalent (36) RSA other (37) City and Guilds other (38) YT/YTP certificate (39) Other qualification
No NVQ	(32) No qualification	(40) No qualifications

[1] See *Census of Population,* 1951, Vol. 23, Table 39 and Table 33.
[2] Australian studies include Junakar and Mahuteau (2005) and Kler (2006).
[3] 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 over-education using a binary variable based on the modal level of qualification by occupation.
[4] Battacharya et al (2006) uses 1992 UK data to show that only 24 percent of Black (Caribbean & African) pupils, 27 percent of Pakistani pupils and 14 percent of Bangladeshi pupils achieved 5 or more GCSE grades A-C (NVQ level 2) in 1992, compared to 36 percent for white pupils.
[5] Jones and Elias (2005) use data from the UK Higher Education Statistics Agency to show that in 1997 the percentages with a first and upper second class degree (NVQ level 4) were 6.1 percent and 45.2 percent for whites respectively. Figures for Black Caribbean (2.2% and 35%), Black African (2.5% and 25.9%), Pakistani (2.6% and 29.1%) and Bangladeshi (2.8% and 25.7%) students are noticeably lower.
[6] See Appendix 12 in Jones and Elias (2005). This shows the percentages with a first and upper second class degree are: whites (9.0% and 48.4%), Black Caribbean (3.8% and 32.7%), Black African (4.25% and 32.7%), Pakistani (5.0% and 34.9%) and Bangladeshi (3.1% and 31%).
[7] 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.
[8] Details of the National Vocational Qualification categories are provided in Table A2 of the Appendix.
[9] All earnings data were deflated to a common year. All models are estimated using weekly earnings, although using hourly wages provides qualitatively similar results.
[10] Trimming the top and bottom 1 percent of the earnings distribution involved a further loss of 7624 observations from our sample.
[11] Highest National Vocational Qualification levels are generated as per the guidelines provided in the QLFS user guide. Details are provided in Table A2 of the Appendix.
[12] However, given that `other' British and foreign qualifications are indistinguishable, some degree of under-representation for labour market entrants in the NVQ level 1 category might be expected, since immigrants who arrived in the UK after they left full time education and have `other' British qualifications as their highest qualification attained have been unavoidably excluded.
[13] Chevalier (2003) provides a comparison of the objective and subjective over-education measures using a survey of graduates.
[14] Dex and Lindley (2007) provide a detailed comparison of ethnic differences derived using different methods for calculating over-education. Generally, over-education is lower and ethnic differences are smaller using occupational mode highest NVQ levels compared to using occupational schooling averages.
[15] The results are qualitatively robust to the choice of error structure implied by the ordered logit model when compared to a multinomial logit. A full set of estimates are available from the author on request.
[16] All these variables are thought to influence the likelihood of over-education. There is some evidence that those living in the South East (especially in London) are more likely to accept a position for which they are over-educated possibly because of the positive experience (and relatively higher wages) associated with living in London, although larger labour markets may allow for better matches especially for dual earner couples. Marriage and children might impede geographical mobility, whilst the prospect of working in a large firm may also be seen as a concession for accepting a job for which one is over-qualified. There is also some evidence that younger workers are more likely to be over-qualified. Dolton and Silles (2001) provide a more detailed discussion on the determinants of over-education.
[17] See http://www.aneki.com/english.html for a list of English speaking countries.
[18] Careful attention is paid to the specification of the wage equation by progressively building up the controls from an initial `base' model which contained only education. These results are available from the author on request.
[19] This model is 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).
[20] The unemployed, by definition, do not have an occupational status.
[21] The results are robust to selectivity correction and a full set of results are available on request. However, please note that the choice of instruments is a contentious issue. The instruments used here included `unemployment rate on entry into the UK labour market' `partner's wage', `local unemployment rates' and

`home ownership' All these instruments were found to be correlated with wages. The selectivity corrected estimates are in line with Blackaby *et al.* (2002) who correct for selectivity bias and observe small changes in the white/non-white earnings differential of around only one percent.

[22] Fortunately, 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 choices (see 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 can lead to a downward bias. Hence OLS estimates provide quite reasonable estimates of the true returns to education.

[23] A likelihood ratio test (test statistic of 1270.85) rejects the null hypothesis of common slope coefficients between men and women. Hence the structural determinants of over/under education are gender specific. A full set of estimates are available from the author on request.

[24] This pooled model imposes the restriction that year effects are the same for immigrants and natives. Since we have included both arrival cohort variables and years since migration the latter measures assimilation effects whilst the former measures differences in cohort quality.

[25] In 1981Greece became a member of the EU, whilst in 1986 Spain and Portugal also joined. In 1995 there was further enlargement when Austria, Finland and Sweden joined.

[26] Likelihood ratio tests (test statistics of 131.12 for men and 96.90 for women) reject the null hypotheses of common slope coefficients between immigrants and natives. Hence the structural determinants of over/under education are immigrant status specific.

[27] Chow tests (test statistics of 9.32 for men and 5.21 for women) reject the null hypotheses of common slope coefficients between immigrants and natives. Hence the structural determinants of earnings differ across immigrant status. Further Chow tests (test statistics of 2.05 for men and 4.55 for women) reject the null hypotheses of common slope coefficients between native born ethnic groups, as well as between immigrant ethnic groups (test statistics of 6.79 for men and 4.05 for women).

[28] A base model containing no controls for the ORU variables was estimated and in most cases this shows that including controls does not change the results substantially. A full set of results are available on request.

[29] Where percentages can be calculated using $[\exp(\beta)-1] \times 100$. It is acknowledged that some differences are small and therefore may not be statistically significant.

[30] Battu and Sloane (2004) used the Fourth National Survey of Ethnic Minorities 1994.

[31] These are calculated as $[e(\gamma_1 - \gamma_2)]x100$ using equation (1). For example this is $[e(0.171-0.117)]x100 = 5.5$ percent for white natives and $[e(0.180-0)]x100 = 19.7$ for South Asian men.