Cathie Marsh Centre for Census and Survey Research

Jobs deficits, neighbourhood effects and ethnic penalties - explaining labour market inequalities of ethnic minorities

CCSR Working Paper 2006-12

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We introduce a unique evidence base of labour market circumstances at the neighbourhood level with ethnic group dimensions from the 1991 and 2001 Censuses. It is a public resource which can be used to investigate local outcomes and to prioritise remedial action. Our analysis demonstrates that 1.1 million new jobs are required to bring every ethnic group in every locality up to the average England and Wales employment rate. Ethnic group accounts for most of this jobs deficit. Local variation in demographic composition and human capital account for a smaller proportion of the jobs deficit.

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Abstract

The reduction of inequalities in the labour market both between ethnic groups and between different local areas is a priority for many governments because it indicates improved access to jobs and a diverse workforce is socially desirable. In this paper, we construct a unique evidence base of labour market circumstances at the neighbourhood level. We use the 2001 Census data for England and Wales, together with information on local characteristics and observed employment rates. We examine the impact of age, sex, birthplace and educational qualifications on the employment of ethnic minorities nationally and compute locally expected employment on the basis of these relationships and local characteristics. Our analysis demonstrates that 1.1 million new jobs are required to bring every ethnic group in every locality up to the average England and Wales employment rate. Ethnic group accounts for most of this jobs deficit. Local variation in demographic composition and human capital account for a smaller proportion of the jobs deficit. Neighbourhood effects have both a geography common to each ethnic group (for example a gradient of higher jobs deficits in the Midlands, the North of England and Wales), and some group-specific characteristics (for example more favourable outcomes for Pakistani and Bangladeshi groups in the North than might have been expected). The findings have far reaching implications for employment policies aimed at improving the labour market circumstances of ethnic minorities. The evidence base is a public resource which can be used to investigate local outcomes and to prioritise remedial action.

Key words: census; employment; locality; inequality, ethnic penalties, Iterative Proportional Fitting

Introduction

Labour market inequalities between ethnic groups and between areas are a priority focus for governments whose intention is to reduce the disadvantage which those inequalities may represent. However, evidence shows that inequalities between ethnic minorities persist and the ethnic minorities face unfair disadvantage and discrimination in the labour market (Berthoud 2000; Cabinet office 2003; Dale *et al.* 2002; Esmail and Everington 1997; Heath and Cheung 2006, Modood *et al.* 1997).

Average inequalities between populations or areas are the result of a variety of societal and personal investments in training, provision of jobs, success in turning qualifications into employment, and the impact of demographic composition such as age structure and birthplace, reviewed for Great Britain by Heath and Yu (2005). Raw differences between populations can be seen as the cumulative impact of disadvantages, including but not limited to discrimination in the labour market. The raw differences between groups are an important indicator of social cleavages. Many social scientists attempt to quantify the extent to which raw differences between groups can be identified with specific factors that create them (Berthoud, 2000; Borjas, 1995; Heath and McMahon, 1997; Cheung and Heath, 2005).

Demographic composition and human capital are the two factors that past studies consistently identify as influences on labour market outcomes. If a population is particularly young then a relatively large proportion will be studying rather than working; a high proportion born overseas might on average suggest inexperience and lack of confidence in the labour market. Such demographic compositional factors are not easy to change, although their impact may be ameliorated for example by provision of English classes for those whose first language is not English. Human capital – principally the skills an individual brings to the labour market – is also known to have a major impact on success in the labour market. Generally, the greater an individual's qualifications the more likely he or she is to gain a job and remain economically active (Heath and McMahon, 1997, show this for England and Wales in 1991, as this paper does for 2001; Hirschman and Snipp 1999 show similar findings for the United States). Thus the extent to which ethnic minorities have gained qualifications may account for some of the average labour market inequalities found

between ethnic populations. That component of inequalities can be targeted with resources to improve and equalise the educational opportunities of each population.

The evidence in Britain suggests that at least one half of the average differences in labour market outcomes for ethnic groups can be attributed to their composition, such that those with lower outcomes are on average younger and have fewer qualifications or have other individual circumstances that disadvantage them (Leslie et al., 2001; Carmichael and Woods, 2000). The remaining differences are often termed 'ethnic penalties'.

The database described and used in this paper measures ethnic penalties nationally and for each neighbourhood of England and Wales (we occasionally use the shorthand 'national' to refer to England and Wales). The evidence shows whether a local outcome that is different from the national is consistent with local demographic composition and human capital. The part of local outcomes which is not consistent with local composition can be thought of as a neighbourhood ethnic penalty and is termed a 'neighbourhood effect'. It indicates local factors that create a worse or better outcome than would be expected from the usual impact of demography and human capital. The nature of these local factors remains hidden, but the identification of areas and ethnic groups where such factors are having an impact is a means of targeting and prioritising the need for investigation and remedial measures. Durlauf (2004) reviews the concepts and varied approaches to analysis of neighbourhood effects. Here we are concerned not with the mechanisms by which neighbourhood effects operate, but to estimate the size of their impact relative to the impacts of ethnic penalties and individual characteristics that operate across all areas of residence. Clark and Drinkwater (2002) examine neighbourhood effects for ethic minorities in Britain from data for the early 1990s and find they are similar to those for the White majority, across differet levels of neighbourhood ethnic concentration.

The paper begins with examples of the raw neighbourhood labour market outcomes which motivate the analyses of this paper. Data estimation methods for the evidence base and jobs deficits are specified in a section on data and methods. The paper then describes the influence on employment rates of age, sex, qualifications and country of birth, for each ethnic group defined in the Census, using data for England and Wales

as a whole. These patterns are used to account for variation in local outcomes that are consistent with local demographic composition and human capital. Local jobs deficits are estimated in the following section, taking into account neighbourhood composition in order to derive the remaining *neighbourhood effects*. The geographical pattern of these neighbourhood effects is compared across ethnic groups through measures of correlation and regional values. The interpretation of neighbourhood effects and their potential use in policy making and the targeting of resources is addressed in the final summary and discussion section.

National and local labour market outcomes: examples

Table 1 shows the employment rate for each of the sixteen ethnic groups recorded in the Census, for England and Wales and for three example neighbourhoods within the UK. The precise definitions of variables and neighbourhoods are discussed in the next section; here the table is used to clarify the data, and a methodological requirement to answer the research questions. The ethnic groups are sorted in Table 1 in decreasing order of employment rate for England and Wales. The majority White Briton population is the only group with a higher employment rate, 75.0%, than the average 73.1% for England and Wales. The other White groups (Irish, and Other White) have higher employment rates than all non-White and Mixed groups. The employment rates of groups vary partly on account of the variation in women's employment rate. The lowest employment rates, of Pakistani and Bangladeshi groups at 42.7% and 39.5% respectively, reflect the particularly low employment rates of women in these two groups and of Muslim women in Britain in general (Dale et al. forthcoming).

Employment rates in three contrasting neighbourhoods are also shown. Two have low employment rates while the third has high employment rates. Sparkbrook in Birmingham in central England has the lowest employment rate in England and Wales and is an ethnically diverse area where White Britons are a minority of the population. Middlesbrough East, on the north-east coast of England, has the lowest employment rate among neighbourhoods with a proportion of White Britons above the average of 83%. Reading North East, in a prosperous part of the Thames valley has the highest employment rate among neighbourhoods with a proportion of White Briton residents below the average.

Table 1. Employment rates, England and Wales and extreme neighbourhoods

	England and Wales		Sparkbrook		Middlesbrough East		Reading North East	
Ethnic group	%	*N (000s)*	%	*N*	%	*N*	%	*N*
White Briton	75.0	*28,130*	54.9	*7,629*	49.4	*28,866*	84.0	*29,998*
Irish	70.1	*436*	47.5	*1,036*	33.3	*222*	83.4	*481*
Other White	67.1	*1,011*	40.3	*414*	26.6	*470*	73.2	*1,357*
Caribbean	66.5	*385*	55.0	*2,050*	51.9	*52*	77.8	*374*
Indian	66.0	*724*	47.5	*2,001*	56.4	*257*	78.5	*834*
Asian-White	61.1	*92*	38.5	*262*	46.3	*136*	72.0	*107*
Other Mixed	59.8	*81*	45.1	*144*	35.8	*67*	72.4	*98*
Other Asian	58.7	*171*	34.3	*1,237*	28.1	*153*	68.5	*149*
Other Black	58.4	*56*	41.8	*263*	25.0	*12*	67.4	*46*
Chinese	58.3	*170*	48.8	*123*	38.0	*92*	65.5	*200*
Caribbean-White	58.0	*95*	40.6	*461*	46.9	*96*	78.6	*98*
African-White	57.4	*41*	23.5	*51*	56.3	*64*	62.5	*24*
African	56.9	*323*	39.1	*358*	46.8	*154*	66.7	*192*
Other	53.0	*170*	37.2	*486*	37.1	*116*	57.2	*180*
Pakistani	42.7	*436*	32.3	*16,547*	37.8	*1,903*	57.7	*567*
Bangladeshi	39.5	*163*	33.2	*3,380*	48.0	*25*	71.4	*21*
All groups	73.1	*32,487*	40.3	*36,442*	48.1	*32,685*	82.2	*34,726*

Source, 2001 Census, Crown Copyright. N: population aged 16-74, excluding retired.
Sparkbrook: Sparkbrook and Small Heath wards; Middlesbrough East: Beckfield, Beechwood, Clairville, Gresham, North Ormesby and Brambles Farm, Middlehaven, Pallister, Thorntree and University wards; Reading North East: Caversham, Mapledurham, Peppard, Thames, Bulmershe and Whitegates, Loddon and South Lake wards.

Every ethnic group in each of the two low-employment neighbourhoods has lower employment rates than any of the ethnic groups in Reading North East. It seems clear that Reading North East has advantages in employment – or attracts individuals with advantages. To afford to live in an area such as Reading North East often requires at least one and more usually two or more household members in receipt of good earnings. The advantages associated with age, sex, birthplace and human capital will be revealed by information about the socio-demographic composition of each neighbourhood.

Inequality *between* ethnic groups is apparent in each of the neighbourhoods, such that the White Briton group has higher rates and the Pakistani and Bangladeshi groups lower rates than each neighbourhood's overall employment rate. If there are clear neighbourhood differences then there is also an independent impact of ethnic group within each neighbourhood. However, the patterns of inequalities between groups are not exactly those of England and Wales as a whole. Bangladeshis have relatively high employment rates in Middlesbrough East and Reading North East, while the Irish

group's employment is particularly low in Middlesbrough East. Some of these different patterns may be attributable to the local socio-demographic composition of each group. Innovatively in this paper we provide a separate assessment of the effects on local employment outcomes of ethnic group, demographic and human capital composition, and the size of the remaining differences between neighbourhoods.

One complicating factor lies in the differing sizes of the populations. What weight should one put on the relatively high employment rate of Bangladeshis in both Middlesbrough East and Reading North East, given that it is based on less than 30 residents in each case? The paper's focus on the 'jobs deficit' is an attempt to assess the research questions using the number of people affected by low employment rates.

Methods and data

This section describes the data used to measure employment and to define neighbourhoods, the methods of national analysis to quantify the main determinants of employment, and the calculation of an expected neighbourhood employment dependent on neighbourhood composition. Neighbourhood effects and jobs deficits are defined by comparing observed with expected employment.

The 'employment rate' measures participation in paid work, whether as an employee or self-employed. It is expressed as a proportion of the whole population. It has become a favoured measure of participation in the UK and is often reported in parallel with the more traditional economic activity rate, which includes the unemployed in the numerator (Simpson et al., 2006). In the 2001 UK Census, the employment rate for males and females is identified in Table ST108 separately for those aged 16-24 and for older adults up to age 74, for each ethnic group. The employment rate is defined in this study as *all those in work* expressed as a percentage of the *adult population, excluding those retired*[1]. Students studying full-time and working are included as employed in census output and in all the analyses reported here.

We have used the full sixteen published categories of ethnic group including four categories of Mixed and a subdivision of the White category, in which we re-label the category 'White – British' as 'White Britons' to emphasise that the census has asked

for a ‘cultural background’ and to avoid all connotations of nationality which is not asked in the UK Census. We tend not to interpret the residual categories (Other White, Other Black, Other Asian, and Other), because their composition in each case is an unknown mixture of those who for a variety of reasons did not find the specific census categories helpful. This heterogeneity creates neighbourhood variation as illustrated later in the paper.

We have defined 1,138 ‘labour market neighbourhoods’ of around thirty to fifty thousand population in England and Wales, as defined and used in Thomas and Dorling (2007). These neighbourhoods are more relevant to local policy interventions than larger areas such as whole city regions, but are large enough to distinguish towns and major parts of cities. The neighbourhoods are each an amalgamation of wards represented in the 2001 Census and are designed to have similar population size. They distinguish, for example, Peckham from other parts of the Borough of Southwark, and twenty neighbourhoods within Birmingham local authority district (including Sparkbrook of Table 1). The neighbourhoods have also been used in the UK by the Neighbourhood Renewal Unit within the Office of the Deputy Prime Minister for neighbourhood analysis and by the Department of Work and Pensions (Parkinson et al., 2006, Simpson et al., 2006). Analysis at a different scale might result in different patterns; in fact analysis with the much smaller electoral wards gave similar results.

The impact of demographic composition and human capital on employment rates is summarised in the next section for each ethnic group using logistic regressions of employment as predicted by age, sex, highest qualification and country of birth from census microdata, the 3% Sample of Anonymised Records which includes 1.3m adults aged 16-74 in England and Wales. The models are restricted to the populations of England and Wales because of the different release of ethnic group data adopted in Scotland and Northern Ireland. The purpose is to summarise the impact of these variables on employment. Analyses including other factors that are influential on employment are included in Simpson et al (2006) and Heath and Yu (2005).

Neighbourhood effects are computed by comparing local employment with the employment rate expected given the evidence for England and Wales as a whole. The comparison will be made in various ways but when most sensitive to local

composition it is based on England and Wales' employment rates for every category combination of the five variables ethnic group, age, sex, qualifications and country of birth. The fully detailed rates for England and Wales are derived from the specially commissioned Table C0333 from the 2001 Census. They are applied to each neighbourhood's composition according to the same variables: age, sex, qualifications and country of birth, for each ethnic group population. The result is the expected number employed in the neighbourhood based on its local mix of age, sex, qualifications, birthplace and ethnic group. The fully detailed neighbourhood composition is unknown. Census outputs provide only two-variable local marginal distributions for each ethnic group. The full local disaggregation of five variables necessary to apply the national employment rates was estimated from these marginal tables using Iterative Proportional Fitting (IPF). This is a relatively complex five-dimensional implementation of a general estimation procedure described by Bishop et al. (1979) and Simpson and Tranmer (2005). A full description of data preparation and commands for this particular implementation of IPF in SPSS is provided in Simpson (2006). The expected local employment is the product of the England and Wales employment rates and the local denominators. Algebra is useful to specify the calculations. Capital letters are used for counts of people, and lower case letters for rates. The subscript *i* denotes the sub-population categories for which the expectation is calculated in each locality *l*. In the most detailed case *i* refers to the full cross-classification of age, sex, qualifications, birthplace and ethnic group. Summing over the sub-population categories gives the expected employment in the locality:

$$E_l^{\exp} = \sum_i e_{EW,i}^{obs} D_{l,i}^{obs}$$

where *obs* and *exp* refer to observed and expected values, *E* represents employment and *e* the employment rate, *D* the population denominator, and *EW* refers to England and Wales. The expected employment rate in locality *l* is then:

$$e_l^{\exp} = E_l^{\exp} / D_l^{obs}$$

where the denominator is summed over the same sub-population categories *i* as the expected employment. The approach is the same as direct standardisation to a reference population in demography.

The full evidence base includes the observed and expected rates for five different labour market indicators: employment, unemployment, economic activity, economic

inactivity and part-time work, each disaggregated not only by locality and ethnic group but also by age and sex (Simpson et al., 2006; CCSR, 2006). Tables of observed and expected rates for user-selected aggregates of localities are provided interactively by summing observed and expected values across localities. When the neighbourhood observed rate is lower than would be expected from the neighbourhood composition, something other than the usual effects of age, sex, qualifications and birthplace has influenced the local outcome.

In order to clarify the procedures and analysis, in this paper we focus on one of the five outcomes, employment, and on the aggregated neighbourhood effect for all persons of an ethnic group, without distinction of age or sex. We focus not on the difference between observed and expected *rates* but on the local jobs deficit, the difference between the observed and expected *numbers* of employed when the observed employment is lower than the expected employment:

$$J_l = E_l^{\exp} - E_l^{obs} = D_l^{obs}(e_l^{\exp} - e_l^{obs}), \text{ if } E_l^{\exp} > E_l^{obs} \text{ and } J_l = 0 \text{ otherwise.}$$

The expression illustrates that the local jobs deficit J_l gives weight both to low employment rates and the numbers affected. Focus on the local jobs deficit avoids distraction by the many neighbourhoods where extreme employment rates result from small ethnic group populations. To provide a simple example, where the local composition is not taken into account the expected employment rate is the value for England and Wales as a whole (e_l^{exp}=73%). In a neighbourhood population of 100 people of working age (D_l^{obs}), the observed employment rate is 63% (e_l^{obs}), and the deficit is 10 jobs. The same low employment rate in a bigger neighbourhood population of 1,000 gives a jobs deficit of 100. The jobs deficit indicates the local lack of jobs as an excess over an expected value. If the employment rate indicates a buoyant economy, a job deficit indicates a depressed economy. The deficit may be summed across neighbourhoods; the cumulated deficit across these two example neighbourhoods is 110 jobs.

The detail of the sub-population categories *i* determines the extent to which local composition is taken into account when computing the expected employment. It is the

detail of the model on which local expectations are based. In the example of the previous paragraph, no detail is included, so that the local expectation is simply the overall England and Wales employment rate. In this paper, this crude expectation is supplemented by two others: (a) ethnic group categories alone, where the expected local employment for each group is that group's England and Wales' employment rate, and (b) the local composition for each group of age, sex, birthplace and qualifications, where the expected local employment is based on the England and Wales' employment rate for each of these sub-population categories. The order in which one compares the results from different expectations affects the amount of variation between localities which is accounted for by ethnic group, demographic composition and human capital. This is equivalent to the comparison of variation accounted for by independent variables entered in a regression analysis, which depends on the order in which variables are entered, but does not alter the main results in this paper as the variables are not strongly associated..

Following the 1991 Census, estimation of neighbourhood effects was undertaken with multilevel statistical modelling for larger sub-national areas, enabling the statistical significance of locality effects to be assessed (Fieldhouse and Tranmer, 2001). In the current case the statistical software did not cope with the large number of smaller neighbourhoods and greater complexity of ethnic groups and other characteristics (Simpson et al. 2006: 273). Multilevel modelling was therefore not used, in favour of the approach used here. We forego the statistical tests of individual neighbourhood effects, in favour of a comparison of jobs deficits accumulated across all neighbourhoods.

The impact of demographic characteristics and qualifications on employment: England and Wales

We begin by summarising, for England and Wales as a whole, the complex relationship between employment and ethnic group, age, sex, qualifications and birthplace, through the results of logistic regression displayed in Table 2. For each ethnic group the 'odds ratio' is shown for a population category in relation to a reference category. An odds ratio less than one shows that employment is on average less for this category than for the reference category, and a value greater than one

shows that employment is on average more for this category than the reference category, for people who otherwise have the same characteristics. More precisely, the odds ratio is the odds of being employed for someone in the category, divided by the odds of being employed for the reference category. The strength of the association of each category with increased or decreased likelihood of employment is shown next to each parameter value. With such a large sample, the categories most associated with unusual employment outcomes are indicated by statistical significance with probability less than 0.001, shown with three asterisks.

[Table 2 – at end of paper]

Age and sex are important predictors of employment. For all ethnic groups, younger adults up to 24 are less likely to be in employment than those aged 25-44, primarily because a proportion of them are still in full-time education. Those beyond the statutory retirement age in the UK are also less likely to be in employment. However the employment of those who might be classed as older workers (aged 45 but below retirement age) varies between ethnic groups; the South Asian groups of older working age are less likely to be in employment than their younger counterparts but the African, Chinese and Other groups are more likely to be in employment. Women are less likely to be in employment than men, for every ethnic group. The relationship with sex varies between ethnic groups, being strongest for Pakistani and Bangladeshi groups and least strong for the Caribbean group. These results confirm those of previous studies (Heath and McMahon, 1997; Cheung and Heath, 2005).

Qualifications improve the chances of gaining a job, and the relationship is slightly stronger for those born in the UK. In the UK, GCSE examinations are taken usually at age 16, grades A-C being considered a good pass. ‘A level’ examinations are taken usually at age 18 in fewer subjects, for which two passes are required for entry to University courses. For those born in the UK people with no qualifications are least likely to be in employment, for every ethnic group. Even the least school qualification, one GCSE, has an odds ratio above one and therefore adds to the likelihood of being in employment. For every ethnic group, the highest employment rates are expected for those gaining a degree. For those born outside the UK, a slightly different relationship holds. The main pattern, for each ethnic group, is that the

beneficial effect of qualifications on employment rates is diminished for those born outside the UK. This will partly be because qualifications gained outside the UK may have been recorded but will carry less weight in the UK labour market. It is also the case that those born abroad include pioneer migrants whose employment on arrival was guaranteed at a time of shortages for unskilled and unqualified labour.

In summary, there are clear relationships between employment rates on the one hand, and each of the demographic characteristics and qualifications which we have examined, for England and Wales as a whole. Local areas with fewer young or older people, with more men, or with more qualified people, and in particular areas with a combination of these characteristics, would be expected to have higher employment rates. For example, an area of established family housing might be expected to have more of those in middle age and with qualifications, and therefore be likely to have a relatively high employment rate. Conversely, an inner city area with many young people is likely to have a relatively low employment rate. We now turn to examine the impact of these national expectations on neighbourhood differences, and the neighbourhood effects that remain.

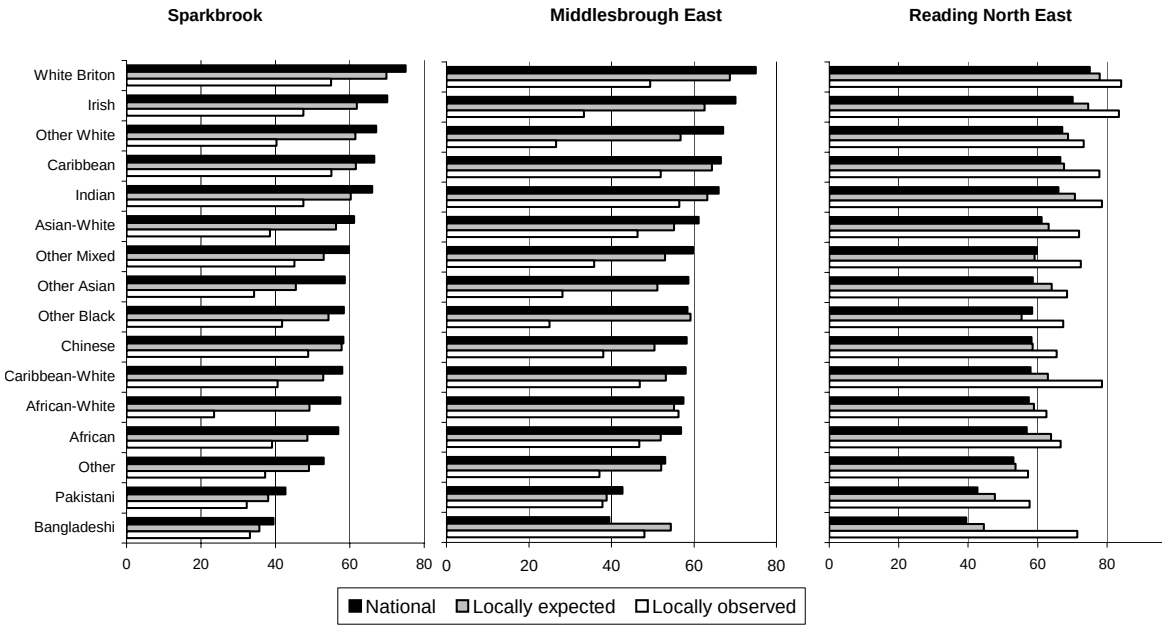
Neighbourhood differences

We begin this section with examples of neighbourhood profiles which enable a rapid comparison of the local employment rate for a specific ethnic group with the national and local rates both for that ethnic group and for other ethnic groups, and with the employment rate expected from the demographic composition and aggregate human capital of the neighbourhood.

We then cumulate the local jobs deficit across all of England and Wales, thereby summarising the impact of ethnic group, the impact of the local composition of individual characteristics that are known to be related to employment rates, and the remaining neighbourhood variation that must be related to other characteristics.

Figure 1 shows the employment profiles for Sparkbrook, Middlesbrough East and Reading North East taken from the evidence base. The ‘National’ and ‘Locally

Figure 1: Neighbourhood employment rates: observed rate, locally expected rate and national rate



observed' employment rates are taken from Table 1, while the 'Locally expected' employment rate has been computed as described, using the fully disaggregated England and Wales rates for each detailed sub-category of ethnic group, age, sex, qualifications and birthplace applied to the neighbourhood population.

In Sparkbrook, the locally expected employment rate for every ethnic group is below the national average. The local lack of human capital and younger demographic structure warns not to expect as high employment rates as in other neighbourhoods. However, for every ethnic group the observed employment rate is lower still, often by 10 percentage points or more. There is a clear neighbourhood effect depressing employment rates for each ethnic group, though not to the same extent for each group.

Middlesbrough East displays a similar pattern but illustrates how taking into account local composition can put the observed differences between ethnic groups into context. For the three White groups the neighbourhood effect is larger than in Sparkbrook, depressing the employment rate by around 20 percentage points beyond the employment rates expected from the local human capital and demographic

composition. The non-White ethnic groups, which are smaller in this neighbourhood, show a more mixed pattern. The Bangladeshi group is expected to have an employment rate considerably higher than nationally – principally because there are relatively few young people and women in this small local population. The observed employment rate which is higher than many other groups in the neighbourhood is in fact lower than the expected value for Bangladeshis given their composition. The advantage of neighbourhood analysis within the national context is shown here in two ways. In Middlesbrough the Bangladeshi population is older and more qualified than nationally, and this has raised their employment rate. However, the extra 'performance' of the Bangladeshi population due to their advantageous composition is not as great as nationally.

In contrast, every ethnic group in Reading North East has higher employment than expected from its composition. There is a positive neighbourhood effect, over and above the positive impact of the age, sex, qualifications and birthplace of the individuals it attracts. To some extent the extra neighbourhood effect may be one of further self-selection, since most residents will need stable employment in order to afford the higher cost of living in this area.

Job Decifits

Table 3 cumulates the jobs deficit across all neighbourhoods of England and Wales. The individual neighbourhood effects illustrated in Figure 1 are summed. This gives weight to all neighbourhoods where the employment rate is low, and gives larger weight to larger populations. The ethnic groups are again sorted by decreasing employment rate in England and Wales. The jobs deficit is calculated first relative to a crude expectation that every group in each area might have the overall England and Wales employment rate of 73.1%. It is the number of jobs that need to be filled to bring up to the England and Wales average all the neighbourhood populations with employment below 73.1%. Expressed in this way, in total there is a deficit of over one million jobs. The first notable result is that the greatest impact of low employment rates is on the White Briton population itself. Although on average this group has higher employment rates, there are many neighbourhoods where the employment of White Britons is significantly below the average, and these neighbourhoods have

relatively large White Briton populations. Such neighbourhoods include many poor ex-industrial areas including Middlesbrough East, and Liverpool's Riverside. Half the total jobs deficit is among White Britons.

However, as a percentage of the ethnic group's population of working age, the jobs deficit for White Britons is 2%, well below the Black and Asian ethnic group populations. The smaller ethnic minority populations are affected by low employment to a greater intensity than the majority White Briton group. The jobs deficit reaches over 30% of the Pakistani and Bangladeshi populations. This total local jobs deficit for each ethnic group as a percentage of their population follows the pattern of employment rates in Table 1.

Table 3. Cumulated local jobs deficit, when local employment is less than reference.

		Expectation: England and Wales rate, 73.1%		Expectation: England and Wales ethnic group rate		Expectation: based on local qualifications and demographic composition	
Ethnic group	Population of working age	Jobs deficit	Per cent of population of working age	Jobs deficit	Per cent of population of working age	Jobs deficit	Per cent of population of working age
White Briton	28,130,382	567,558	2.0%	760,966	2.7%	579,190	2.1%
Irish	436,137	23,075	5.3%	16,341	3.7%	13,131	3.0%
Other White	1,011,288	71,508	7.1%	38,275	3.8%	31,216	3.1%
Caribbean	384,617	29,816	7.8%	14,005	3.6%	11,183	2.9%
Indian	723,855	56,371	7.8%	25,982	3.6%	16,647	2.3%
Asian-White	92,473	12,150	13.1%	4,661	5.0%	3,920	4.2%
Other Mixed	81,226	11,617	14.3%	3,992	4.9%	3,558	4.4%
Other Asian	171,443	26,109	15.2%	8,391	4.9%	6,566	3.8%
Other Black	56,124	8,925	15.9%	2,565	4.6%	2,323	4.1%
Chinese	170,085	26,892	15.8%	10,539	6.2%	6,646	3.9%
Caribbean-White	94,782	15,073	15.9%	4,266	4.5%	3,791	4.0%
African-White	41,096	7,159	17.4%	2,465	6.0%	2,282	5.6%
African	323,006	53,259	16.5%	10,747	3.3%	7,786	2.4%
Other	170,376	34,786	20.4%	8,040	4.7%	7,120	4.2%
Pakistani	436,459	133,302	30.5%	14,775	3.4%	8,322	1.9%
Bangladeshi	163,402	55,318	33.9%	6,195	3.8%	4,246	2.6%
Total	32,486,751	1,132,918	3.5%	932,205	2.9%	707,928	2.2%
Non-White groups	2,908,944	470,776	16.2%	116,623	4.0%	84,391	2.9%

The England and Wales average is the target used at present by the UK government's Department for work and Pensions. One might argue that the currently privileged White Briton group should be the reference. In this case, jobs deficits appear whenever the local group employment rate is below 75.0%, and the cumulated jobs deficit across England and Wales is raised to 1.4m (not shown in the table).

Within each ethnic group, there are also wide variations between neighbourhood employment. Table 3 shows next the jobs deficit when each neighbourhood's ethnic group population is compared not to the overall rate of 73.1% but to that ethnic group's own national rate. Apart from the White Briton group the jobs deficits are lower than when compared to the overall national rate. Nonetheless, neighbourhoods differ such that, for example, over sixteen thousand jobs would be needed to bring Irish employment in each neighbourhood up to the current Irish average. It is natural that in about half of all neighbourhoods, the employment rate will be below the average. The cumulated jobs deficit measures by how much these neighbourhoods are below the average. As a percentage of their population of working age, the Chinese group now has the largest jobs deficit: there is more variation in employment between neighbourhoods than for other groups. The percentage jobs deficit is least for White Britons: the variation in employment rates is less than for other groups.

Some of the variation between neighbourhoods is due to local demographic composition and human capital. Thus the final column measures the extent of remaining neighbourhood effects for each ethnic group, which are explained neither by the group's own national employment rates nor by the group's local neighbourhood composition of age, sex, qualifications and birthplace. The Chinese, Pakistani and Indian group neighbourhood differences are accounted for by local composition in this way more than other groups. The Pakistani residual jobs deficit due to neighbourhood effects is smaller than that for White Britons, while the largest jobs deficits as a proportion of their population are for the Chinese and Irish groups, and each of the Mixed and residual groups. This latter result simply illustrates that the Mixed and residual groups are very diverse, containing sub-groups with high and low employment that tend to live in different areas and are therefore identified by neighbourhood effects.

For the ‘main’ ethnic groups, the neighbourhood effect is summarised as a national jobs deficit of between two and three per cent of the working age population. It is small compared to the local jobs deficits of between ten and thirty per cent for the Chinese, African, Pakistani and Bangladeshi groups when compared to the national employment rate. This suggests that neighbourhood effects are not as great as ethnic inequalities. Demographic composition and qualifications do have some impact on neighbourhood inequalities. This is shown by the difference between the last sets of columns in Table 3. However, the impact is relatively small. It is always less than 2.5 per cent of the population of working age, and is always smaller than both the ethnic inequalities and the remaining neighbourhood effects. In other words, differences in human capital are important but account for only a small amount of the wide disparity found in the local employment experience of ethnic groups.

Correlation between ethnic groups’ neighbourhood effects

This final section of results examines the geographical variation of neighbourhood effects. Table 4 shows the correlation between neighbourhood effects for the White Briton group with each other group. The neighbourhood effect is measured here as the locally expected employment rate subtracted from the locally observed employment rate, for each of the 1,138 neighbourhoods in England and Wales. The unweighted correlations are all positive but are not high; this is because the populations other than White Briton are very small in most of the neighbourhoods, creating random volatility in the rates. When weighting the neighbourhoods by the population of the group concerned, the correlations are all greater than the unweighted values, are all above 0.45. This suggests that while the influences are not precisely the same for each group, there is a strong common geography to neighbourhood effects. It is particularly similar for the three White groups. The Bangladeshi, African and Pakistani groups’ geography is least correlated with the White Briton geography of neighbourhood effects (correlations of between 0.46 and 0.51), suggesting that these groups’ local fortunes are influenced by unique factors. These are the three most recent streams of migration to Britain, whose inclusion in the labour market is least secure. The positive message is that the ethnic minorities with longest history in Britain are most integrated in its labour market geography.

Table 4 Correlation between employment neighbourhood effects of White Briton and other ethnic groups

	Unweighted	Weighted by population
Irish	0.72	0.81
Other White	0.75	0.79
Caribbean-White	0.35	0.57
African-White	0.24	0.47
Asian-White	0.39	0.58
Other Mixed	0.32	0.58
Indian	0.36	0.65
Pakistani	0.10	0.51
Bangladeshi	0.14	0.42
Other Asian	0.29	0.63
Caribbean	0.20	0.65
African	0.24	0.50
Other Black	0.16	0.46
Chinese	0.24	0.62
Other	0.30	0.56

1,138 neighbourhoods of England and Wales. 'Neighbourhood effect': observed – expected local employment rate. In the second column, each neighbourhood is weighted by the population of working age in the ethnic group shown.

When the total jobs deficit for all ethnic groups is summed, there is a clear regional gradient from low joblessness in the South and East of England, to greatest joblessness in the North and in Wales, with London and the Midlands in an intermediate position. Table 5 shows this gradient most clearly in its lower half, when the jobs deficit is expressed as a percentage of the group's population of working age, as in the final column of Table 3. The regional gradient from South to North and to Wales is repeated for the White Briton, Irish, Caribbean and Indian groups but is different for the other groups. Only the eight non-Mixed and non-residual groups are shown, both for reasons of space and because the other groups are each a mixture of differing sub-populations.

The Pakistani and Bangladeshi groups in Wales and the North are not as disadvantaged as in the Midlands and in London. One must remember that this notion of disadvantage is in relation to each group's national employment rates. Although Pakistani and Bangladeshi employment rates are low in all regions, they are not especially low in Wales and the North as are other groups, after demographic composition and human capital has been taken into account. The Chinese local jobs deficit is noticeably higher than that of other groups in the South and East of England and in the West Midlands, but not so high in Wales as most other groups.

Neighbourhoods of significantly low Chinese employment occur in most regions. The neighbourhood residual jobs deficit for Indians is highest in the North West.

Table 5: Cumulated local jobs deficit by region

(a) Jobs deficit	White Briton	Irish	Caribbean	Indian	Chinese	African	Pakistani	Bangla-deshi	Total
East of England	12,505	319	168	401	528	278	172	94	17,607
South East	26,004	668	413	758	508	349	210	47	33,960
South West	26,255	416	204	322	245	173	74	35	29,698
East Midlands	33,219	575	593	1,280	568	386	275	57	40,015
West Midlands	34,734	1,564	1,693	2,520	950	607	2,906	508	51,673
London	60,040	4,624	6,478	4,840	1,708	3,983	1,502	2,968	108,228
Yorkshire	62,086	659	462	1,791	601	567	2,001	180	74,054
North West	132,382	2,765	939	3,874	1,133	900	978	235	150,554
Wales	102,030	1,045	146	436	130	315	132	53	106,938
North East	89,934	498	87	426	274	227	73	71	95,201
Total	579,190	13,131	11,183	16,647	6,646	7,786	8,322	4,246	707,928

(b) Per cent of working age population	White Briton	Irish	Caribbean	Indian	Chinese	African	Pakistani	Bangla-deshi	Total
East of England	0.4%	0.8%	0.9%	1.1%	3.5%	2.2%	0.7%	0.9%	0.5%
South East	0.6%	1.2%	2.0%	1.2%	2.0%	1.9%	0.6%	0.5%	0.7%
South West	0.9%	2.0%	2.3%	2.7%	2.6%	3.8%	1.7%	1.2%	1.0%
East Midlands	1.4%	2.5%	3.2%	1.5%	5.9%	5.5%	1.6%	1.4%	1.5%
West Midlands	1.2%	3.5%	3.1%	2.1%	7.9%	7.0%	3.2%	2.9%	1.6%
London	2.2%	2.9%	2.8%	1.6%	2.8%	1.6%	1.6%	3.3%	2.3%
Yorkshire	2.2%	3.0%	3.1%	5.0%	6.4%	8.2%	2.3%	2.6%	2.4%
North West	3.5%	5.4%	6.7%	7.9%	5.9%	8.1%	1.4%	1.6%	3.6%
Wales	6.0%	9.1%	7.8%	7.3%	2.9%	13.1%	2.6%	1.7%	6.0%
North East	6.0%	8.6%	11.4%	5.8%	6.2%	11.8%	0.8%	2.1%	6.1%
Total	2.1%	3.0%	2.9%	2.3%	3.9%	2.4%	1.9%	2.6%	2.2%

Three quarters of African residents of working age in England and Wales live in London (Simpson et al., 2006: 42, provides a regional population summary). It is therefore not surprising that the largest cumulated local jobs deficit is in London. However, this is the lowest jobs deficit as a proportion of population of all the regions. Africans outside London tend to have considerably lower employment rates than in London, lower than their demographic characteristics and human capital would suggest. The jobs deficit is particularly high in the West Midlands and the North of England. There are groups of African individuals and families who are particularly isolated and unsupported in the labour market.

Table 6: Greatest jobs deficits for each ethnic group

(a) Relative to the England and Wales employment rate of 73.1%

White Briton	Irish	Caribbean	Indian	Chinese	African	Pakistani	Bangladeshi
6850 Middlesbrough East	446 London Tollington	933 London Hackney South	2555 Leicester Knighton	636 Cambridge West	1102 London Tottenham North	6934 Bradford University	5955 London Poplar
6460 Liverpool Riverside North	389 London Holborn	908 Birmingham Ladywood West	2298 Leicester Belgrave	464 Manchester Moss Side	1014 London Hackney South	6764 Birmingham Sparkbrook	5593 London Stepney
6433 Liverpool Riverside South	385 Manchester Gorton West	882 Birmingham Ladywood East	2134 Blackburn East	439 London Hyde Park	957 London Forest Gate	3710 Bradford Undercliffe	3852 London Bow
6321 Knowsley North	358 London St. Pancras	873 London Vauxhall South	1571 Birmingham Handsworth	409 London Southwark North	847 London Vauxhall North	3657 Birmingham Ladywood East	1705 Oldham West
5369 Leeds Headingley	306 Manchester Ardwick	671 London Vauxhall North	1400 London Southall West	406 London Holborn	843 London East Ham South	3445 Birmingham Fox Hollies	1581 London East Ham North

(b) Relative to local expectation for the group

White Briton	Irish	Caribbean	Indian	Chinese	African	Pakistani	Bangladeshi
6127 Liverpool Riverside South	348 London Holborn	460 London Hackney South	894 Blackburn East	274 Cambridge West	226 London Southall West	954 Birmingham Sparkbrook	803 London Poplar
5556 Middlesbrough East	289 London Tollington	425 Birmingham Ladywood West	514 Batley	188 Manchester Moss Side	225 London Holborn	784 Bradford University	803 London Stepney
5526 Liverpool Riverside North	275 London St. Pancras	410 London Vauxhall South	509 Leicester Knighton	184 Sheffield City West	223 London Regent's Park	469 Bradford Undercliffe	463 London Bow
5218 Cambridge West	247 Manchester Gorton West	386 Birmingham Ladywood East	476 Bolton Daubhill	164 Liverpool Riverside North	207 London East Ham North	425 Birmingham Ladywood East	161 Birmingham Ladywood East
5013 Leeds Headingley	231 London Regent's Park	310 London Stoke Newington	456 London East Ham North	161 London Deptford North	202 London St. Pancras	306 Birmingham Fox Hollies	110 London East Ham North

For policy purposes, identification of the largest neighbourhood effects allows effective targeting of policy interventions. Table 6 provides these extreme values in two ways that reflects the discussion of neighbourhood effects in this paper. For each of the eight 'main' groups, the five greatest neighbourhood jobs deficits are listed,

calculated as the number of jobs required to bring the group's neighbourhood employment up to the England and Wales average of 73.1%. Middlesbrough East and Sparkbrook both feature in the list, for the White and Pakistani groups that are the largest in those neighbourhoods. Only four neighbourhoods appear on the list for more than one group, and these are in diverse areas of London and Birmingham. The largest jobs deficits are usually in jobs-poor neighbourhoods where the group has greatest presence, which will logically not be the same neighbourhood for each group. The table allows targeting of large jobs deficits where the approach for remedial actions may be nuanced according to the different cultural, political and employment environments.

The second part of Table 6 provides the neighbourhood effect –the jobs deficit calculated given that group's national employment rates and the local demographic composition and human capital. The figures are therefore smaller than the raw jobs deficits in the first part of Table 6, and particularly so for the groups whose national employment rates are much lower than the England and Wales average. These residual jobs deficits do not show the jobs needed to equalise the groups, but the jobs needed to bring the group up merely to the employment level expected locally for that group, given the local demographic composition and human capital. In fact four out of the five same neighbourhoods occur in both parts of the table for all but three groups. For the Indian group, the two largest residual jobs deficits are in Batley and Blackburn East, which are the only neighbourhoods where more than 90% of the Indian population is Muslim. For the Chinese group, three London neighbourhoods with large raw jobs deficits may include many young students, as they do not appear in the largest residual deficits after age and other composition is taken into account. Demographic composition and human capital is associated with the Africa raw jobs deficits, so that the residual jobs deficits highlight other neighbourhoods. These other differences may be different country or social origins within Africa, different residence status, or may relate to a range of local policies and community responses to the labour market, whose discussion is included in the next and final part of the paper.

Summary and discussion

The empirical starting point of this paper is the national impact of qualifications and demographic characteristics on the labour market outcome of each ethnic group. We have measured this impact for England and Wales with the latest 2001 Census microdata. The results confirm other studies' findings that young people, women and people without qualifications are less likely to be employed, and that there are variations between ethnic groups, principally the relatively high employment rates of Caribbean women and the relatively low employment rates of Pakistani and Bangladeshi women; each ethnic minority group has lower rates of male employment than the White Briton average, but to differing extents. Qualifications raise the employment rate of each group, but the impact of qualifications is less for those born outside the UK, the majority of whom will also have been educated outside the UK.

The analysis proceeds to new ground by applying these national relationships to interpret local labour market outcomes from the latest Census. It has assessed the contribution of human capital and demographic characteristics to the geography of employment, and distinguished it from the remaining *neighbourhood effects*.

The paper has defined and used the *jobs deficit* as a measure of the impact of low employment in a locality, for each ethnic group. The estimation of jobs deficits has a number of benefits. It provides expected employment outcomes to compare with observed values not only for each locality but for each sub-population defined by age, sex, ethnic group, birthplace and qualifications. It is based on the fully saturated model, so that each interaction of those variables with employment is fully used to assess local expected values. The jobs deficit neatly combines the size of a local population with low rates of employment in a way that can also be summed across neighbourhoods. Finally, the jobs deficit is a measure that is readily understood in relation to policy objectives equalising employment outcomes across social groups and localities.

Overall 1.1 million jobs are needed to bring employment for each population in each neighbourhood up to the current England and Wales average. 1.4 million jobs would be needed to bring employment up still higher to reach to the White Briton average, for every group in every neighbourhood. For some ethnic minority groups, jobs deficits are large relative to their population of working age, implying an addition of

thirty percentage points to Pakistani and Bangladeshi employment, and an addition of between 10 and 20 percentage points to Chinese and African employment. However, in absolute terms, half the total jobs deficit is among local White Briton populations. The jobs deficit highlights local White lack of employment in the same way and on the same scale as other groups.

A population's jobs deficit is greatly reduced when measured against its own average in England and Wales. Thus local replication of national inequalities accounts for most of the jobs deficits among ethnic minority groups. In the extreme case, the Pakistani and Bangladeshi local jobs deficits would each drop to one ninth of their current value if local employment rates were increased by the national deficit. This local impact of national inequalities overshadows but does not eliminate the impact of local demographic composition and qualifications. The geography of qualifications, birthplace, sex and age structure does impose further local jobs deficits for each ethnic group: many areas with low unemployment have that condition partly because their residents are les well-qualified, or younger than the residents of other areas. Among ethnic minorities, local deficits of 32 thousand jobs are accounted for in this way.

The remaining local disadvantage is not related to the measured individual characteristics of residents and has been termed the neighbourhood effect. It is considerable in extent and larger than the impact of local composition measured by sex, age, qualifications and birthplace. Its nature however may be structural, contextual, or compositional (Blalock 1984; Curtis and Rees, 1998). A structural economic effect might impose a lack of local jobs. A contextual effect would suggest that the local area's composition affects the employment of residents irrespective of their own characteristics. Thus a generally low employment level may make it harder to find jobs because of poorer social networks and lower expectations of work. On the other hand a compositional effect would simply be the concentration of individuals with poor labour market outcomes for reasons that have not been measured. These might include selection effects: the unemployed tend to concentrate in areas of poorer housing. Thus neighbourhood effects are not necessarily structural rather than compositional in nature, but do identify where there are particular problems faced by significant numbers of people, that are not accounted for by their level of qualifications or demographic characteristics.

We have shown that the neighbourhood effects for each ethnic group are correlated, with greater jobs deficits in neighbourhoods in the Midlands than in the South, and higher still in the northern regions of England and in Wales. Departures from that pattern involve higher local jobs deficits within the South for Chinese and in the North-West for Indians, and lower jobs deficits for Pakistani and Bangladeshi groups in the North and Wales and for Africans in London.

The results from this paper have broad policy implications in two directions. First, neighbourhoods with large jobs deficits can be targeted for remedial action on jobs, and the focus of that action can be nuanced according to the ethnic group composition of that jobs deficit. Second, it is clear that action to reduce inequality between ethnic groups is relevant to all neighbourhoods. Such action would require rethinking assumptions whereby, according to Webster (2006), government is often "very confident that the problem lies entirely on the supply side of the labour market. In other words it is caused by the characteristics or motivation of workless people and not by any shortage of demand for labour." Our analysis confirms that the characteristics of workless people account for only a small portion of local differences in unemployment. The analysis does not provide a neat account of the causes of neighbourhood and group differences but we can suggest some interpretations that are consistent with the results, and some questions that remain for further investigation with these and other methods.

Are the inequalities between groups due to discrimination? Quantified evidence of direct discrimination at the point of recruitment has come from audit studies matching job applications (Esmail and Everington 1997) while indirect discrimination has been inferred through poorer performance in the educational system (Heath and Yu, 2005). Some differences in employment between ethnic groups may be chosen culturally without any sense of disadvantage necessarily attaching to them. Pakistani and Bangladeshi women's low employment could be described as partly a result of preference to nurture home and family after marriage and in particular after the birth of a child. However, only qualitative studies can identify the extent to which such a preference necessarily excludes employment, or indicates lack of employment acceptable in its location and nature (Dale et al. 2002). Such arguments of cultural

preference are also not easily related to the clearly lower male employment rates for each ethnic minority. Our results suggest that whatever the balance of preference and discrimination in creating ethnic inequalities, the impact is not limited to poor or ethnically diverse areas. On the contrary, those inequalities are replicated throughout England and Wales and account for most of the local jobs deficit for each ethnic minority.

What causes neighbourhood effects to vary between ethnic groups? Structural, contextual and compositional types of neighbourhood effect might be expected to affect all groups, but the correlation between groups' neighbourhood effects is not perfect. What mechanisms might act to locally affect groups' average employment in different ways? Local agencies in their provision of services and careers support may well act differently to each group, instilling either disadvantage or equality in different areas. Some local agencies may be specifically oriented to one or several ethnic groups, including self-help and voluntary organisations. Their response to the labour market and their social networks may increase local employment opportunities. If cultural responses to the labour market affect employment levels then they are likely to be supported by cultural networks which may be locally strong in some neighbourhoods more than others. For some groups without English as a first language, there may be local responses which affect employment through English language support, or employment in which management is bilingual and English proficiency unnecessary. Finally, the categories of ethnic group are crude as they must be in a census, and hide some variation in origins and in particular in the social and cultural networks that affect levels of employment. These variations have geographical expression, such that for example people from different regions of a country, or different islands of the Caribbean, will tend to live greater numbers in different neighbourhoods, and create the neighbourhood effects we have measured. The lower employment rates of Indian Muslims relative to other Indians in Britain have been noted before (Peach 2005; Modood et al. 1997). This may explain why the Indian jobs deficit is highest in the North West where the Muslim Indian populations are relatively large in Bolton ad Preston.

Further research of a qualitative nature would allow a clearer understanding of the commonalities and variation between neighbourhoods of the factors that create

employment inequalities between ethnic groups. This paper has achieved a description of the extent of ethnic group inequalities expressed as jobs deficits, demonstrated their consistency across neighbourhoods of Britain, and developed a methodology to highlight the neighbourhoods in which employment falls most below national expectations.

Acknowledgements

The Department for Work and Pensions financed the development of the database and some of the analyses in this paper. Census data are Crown Copyright.

Note

[1] The Census output includes all those aged up to 74, including many retired people who are not usually included in labour market analyses. Many non-White groups have few elderly at present and thus the inclusion of the retired would misleadingly depress the employment rate of the older White groups.

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Table 2. Odds ratios from logistic regression of employment on demographic characteristics and qualifications, for each ethnic group, England and Wales 2001

Variable		White		Irish		Other White		Caribbean-White		African-White		Asian-White		Other Mixed		Indian	
	Intercept	2.094	***	1.259	**	1.290	**	0.738	**	0.650	*	1.432	*	1.028		1.379	***
Age	16-24	0.377	***	0.301	***	0.317	***	0.409	***	0.598	***	0.277	***	0.301	***	0.196	***
	25-44 (reference)	**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**	
	45-Retirement	1.048	***	0.897	*	1.160	***	1.281		1.219		1.234		1.290		0.717	***
	Retirement-74	0.614	***	0.706	***	0.739	***	0.532		2.234		0.578		0.602		0.230	***
Sex	**Male (reference)**	**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**	
	Female	0.542	***	0.678	***	0.564	***	0.634	***	0.903		0.633	***	0.702	***	0.518	***
Birthplace	**UK born (reference)**	**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**	
	Non UK Born	0.910	*	1.251	**	1.140		1.172		0.699		0.548	**	0.742		1.645	***
Highest qualification	**No qualification (reference)**	**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**		**1.000**	
	1 GCSE	2.901	***	2.983	***	2.280	***	3.615	***	2.094	**	2.550	***	2.986	***	2.846	***
	5+ GCSE grades A-C	3.408	***	3.896	***	3.200	***	4.536	***	3.077	***	2.557	***	2.898	***	3.343	***
	2 A levels	3.111	***	3.947	***	2.904	***	6.534	***	3.284	***	2.246	***	3.059	***	3.442	***
	Degree	5.441	***	6.917	***	5.772	***	6.417	***	5.176	***	6.686	***	5.441	***	8.829	***
	Other qualification	2.266	***	3.337	***	2.573	***	3.831	***	2.699	**	0.862		1.190		3.364	***
Interaction: non-UK born by highest qualification	No qualification (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	1 GCSE	0.898		0.759		0.916		0.870		1.361		0.808		0.931		0.823	
	5+ GCSE grades A-C	0.876	*	0.712	*	0.775	*	1.171		0.859		1.327		1.151		0.769	*
	2 A levels	0.735	***	0.762		0.752	*	0.407		0.963		1.523		0.810		0.566	***
	Degree	0.866	*	0.688	**	0.546	***	0.688		0.833		0.584	*	0.781		0.379	***
	Other qualification	0.924		0.789		0.892		0.349		1.339		3.525	*	3.019	*	0.578	*

Variable		Pakistani		Bangla-deshi		Other Asian		Caribbean		African		Other Black		Chinese		Other	
	Intercept	0.850		0.726		1.026		0.816	*	0.304	***	0.721	*	1.559		0.568	
Age	16-24	0.383	***	0.459	***	0.315	***	0.254	***	0.299	***	0.322	***	0.144	***	0.287	***
	25-44 (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	45-Retirement-	0.619	***	0.488	***	1.214	*	1.145	*	1.937	***	0.967		1.493	***	2.038	***
	Retirement-74	0.248	***	0.123	***	0.429	***	0.770	*	0.845		0.820		0.523	**	0.779	
Sex	Male (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	Female	0.235	***	0.214	***	0.491	***	0.834	***	0.738	***	0.823		0.592	***	0.639	***
Birthplace	UK born (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	Non UK Born	1.284	**	1.313		0.969		1.474	***	1.204		2.599	**	1.366		1.587	
Highest qualification	No qualification (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	1 GCSE	2.504	***	2.195	**	2.683	**	3.658	***	6.184	***	2.980	***	3.644	***	4.162	**
	5+ GCSE grades A-C	2.664	***	3.235	***	2.128	**	4.345	***	7.523	***	2.945	***	2.965	***	4.354	***
	2 A levels	3.271	***	3.108	***	2.686	***	5.109	***	8.061	***	5.181	***	3.337	***	3.028	**
	Degree	8.628	***	10.176	***	8.224	***	8.158	***	14.746	***	7.493	***	10.454	***	6.600	***
	Other qualification	2.155	***	3.804	**	1.916		2.380	***	3.987	***	1.621		2.872		2.614	
Interaction: non-UK born by highest qualification	No qualification (reference)	1.000		1.000		1.000		1.000		1.000		1.000		1.000		1.000	
	1 GCSE	0.948		1.077		0.671		0.595	***	0.470	**	0.207	***	0.403	*	0.384	*
	5+ GCSE grades A-C	1.080		0.808		1.198		0.555	***	0.593		0.687		0.376	**	0.363	*
	2 A levels	1.030		1.244		1.148		0.471	***	0.548	*	0.278	**	0.257	***	0.489	
	Degree	0.408	***	0.532	*	0.447	**	0.405	***	0.508	**	0.212	***	0.143	***	0.319	**
	Other qualification	0.854		0.688		1.241		0.822		0.745		0.523		0.437		0.547	

Statistical significance: * p<0.05; ** p<0.01; *** p<0.001. Retirement: 65 for men, 60 for women.