DISCUSSION PAPER SERIES

RACIAL AND ECONOMIC FACTORS IN ATTITUDES TO IMMIGRATION

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LABOUR ECONOMICS

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CEPR Discussion Paper No. 2542

August 2000

ABSTRACT

Racial and Economic Factors in Attitudes to Immigration*

Hostility towards minorities may sometimes have economic rather than racial motives. Labour market fears, or concerns about the welfare system, are often believed to manifest themselves in hostile attitudes towards population groups that are considered to be competitors for these resources. The question of how attitudes of majority populations towards immigration are determined is of great importance for implementing appropriate policies. We try to separate racial and economic components to such attitudes. Our analysis is based on the British Social Attitudes Survey, which includes questions on attitudes towards immigration from different minority groups, as well as attitudes towards related concerns, like job security and benefit expenditures. We specify and estimate a multiple factor model. The correlation between answers to questions on immigration and on related issues helps us separate different aspects to attitudes. We find that racial attitudes are strongly associated with hostility to immigration from ethnically distinct populations. Furthermore, there is evidence that welfare and labour market concerns are related to attitudes towards immigration, but only among skilled and highly educated workers.

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NON-TECHNICAL SUMMARY

A recent report by the United Nations' Population Division (2000) indicates that over the next 50 years, European countries as well as Japan will face a dramatic population decline. To keep its working population stable between now and 2050, the European Union would (at current birth rates) have to import 1.4m immigrants a year. To keep the ratio of workers to pensioners equal, the inflow would be 12.7m per year. Migration is, again, a prominent and controversial issue in the policy debate in Europe. Attitudes towards further immigration may arise from racial antipathy and have a similar origin to the hostility shown towards settled ethnic minorities. Alternatively they may be related to economic fears concerning the labour market or the welfare state. Immigrants may be felt to constitute a threat to economic opportunities of native workers or a burden to the taxpayer through anticipated heavy usage of the welfare system. Whatever the objective truth about these matters it is evident that there are widespread related fears that lie at the heart of debate both in Europe and in the US. Personal opinions about these matters are likely to shape attitudes towards migration-related questions and eventually influence migration policies. In the public debate, restrictions to reduce immigration are often justified by arguing that immigration endangers the economic wellbeing of the native population.

Labour market fears, or concerns about the welfare system, may manifest themselves in hostile opinions against the immigration of population groups that are considered to be competitors for these resources. Opposition to ethnic minority immigration may not only be motivated by labour market or welfare concerns, but also by racial prejudice. These prejudices may arise from several sources. They may be fuelled, among other things, by a fear of loss of national characteristics or a taste for cultural homogeneity. Racial prejudice is likely to be related to the ethnic origin of immigrants and may be more pronounced, the more ethnically and culturally dissimilar the immigrant population is.

It is likely that attitudes of majority individuals towards further immigration are related to their economic situation, their educational background, and their labour market status. In other words, the contribution of labour market fears as well as welfare concerns should be more pronounced for those who are most directly affected by competition of migrant workers. Also, the contribution of racial prejudice should be most apparent for immigrant populations who are ethnically and culturally more distinct from the majority population.

In this Paper, we attempt to separate the relative effects of these three components on the attitudes towards immigration: racial prejudice, labour market fears and concerns about welfare system use. We base our analysis on various waves of the British Social Attitude Survey, which asks questions

about attitudes towards immigration from different minority groups, including some more and some less ethnically similar to the indigenous population.

Our results are interesting in several respects. First, we do find evidence that both welfare and labour market concerns are associated with opinion towards further immigration. However, by far the most important single factor is racially motivated opposition.

Second, we find that attitudes towards immigration, and the relative importance of the three factors, differs according to the ethnic origin of the immigrant population concerned. Our data allows us to distinguish between attitudes towards four different origin groups. Our results indicate that a negative attitude towards further immigration is strongly related to all three factors for Asians and West Indians, while it is less strongly explained for Europeans. The factors we have defined hardly explain at all the attitudes towards Australians and New Zealanders, which suggests that opposition towards immigration from such sources is scarcely linked to any of our systematic factors. The dominant racial factor is particularly strong for the Asian and West Indian population.

Third, we do not find strong evidence that the greater labour market concerns sometimes believed to exist among unskilled and manual workers are reflected in opposition towards further immigration. We find that welfare and labour market concerns are more closely linked to opinions towards further immigration for non-manual workers than for manual workers and for the more educated rather than the less educated.

These results conflict with the frequently expressed opinion that greater hostility to immigration amongst the more economically disadvantaged sections of the population is driven by fear of economic competition in labour markets. We find an association between labour market concerns and hostility to immigration only amongst better-educated and more skilled sections of the labour force. Antipathy towards immigration amongst manual and poorly educated workers is associated only and strongly with racial attitudes. This may reflect differences in the process of opinion formation towards immigration depending on levels of education.

Economic policy interventions, which reduce job insecurity or welfare concerns, appear likely therefore to be effective only in reducing hostility to immigration amongst the better educated and more highly skilled sections of the labour market. Addressing the antipathy to immigration at the lower end of the spectrum of skills and education requires engaging the stereotypes that underlie the racial antagonisms driving these attitudes.

1　Introduction

A recent report by the United Nations' Population Division (2000) indicates that over the next 50 years, European countries as well as Japan will face a dramatic population decline. To keep its working population stable between now and 2050, the European Union would (at current birth rates) have to import 1.4m immigrants a year. To keep the ratio of workers to pensioners equal, the inflow would be 12.7m per year. Numbers for the US are less dramatic, but further immigration is also required to keep the working population constant.

Debate about immigration is controversial and high on the political agenda both in Europe and in the US, figuring prominently in electoral campaigns. Attitudes of the majority population towards further immigration seem to be strongly hostile. There are speculations that these negative attitudes may arise from racial antipathy and have a similar origin to the hostility shown towards settled ethnic minorities. Alternatively they may be related to economic fears concerning the labour market or the welfare state. Immigrants may be felt to constitute a threat to economic opportunities of native workers or a burden to the taxpayer through anticipated heavy usage of the welfare system. Whatever the objective truth about these matters it is evident that there are widespread related fears that lie at the heart of debate both in Europe and in the US. Personal opinions about these matters are likely to shape attitudes towards migration related questions, and eventually influence migration policies.

In the public debate, restrictions to reduce immigration are often justified by arguing that immigration endangers the economic well being of the native population. Borjas (1999, p.105) claims that two of the three issues

in the historical debate over immigration policy in the United States are the labour market consequences for natives, and whether immigrants pay their way in the welfare system. Public opinion seems to be guided by the myopic view that more people increase unemployment, reduce wages, and are an additional burden on the welfare system. Although the empirical evidence suggests that the impact of immigration on wages and unemployment is, if it exists, small, this view is deeply rooted in the public debate. Studlar's (1977) empirical study of popular British attitudes to immigration in the 1960s concludes that the facts regarding the economic impact of immigration "have not erased the erroneous mass perceptions of the relationships among immigrants, the economy and welfare services, perceptions on which people base their immigration opinions." Money (1999) argues that the prominence of immigration in British political debate was driven by the concentrated settlement of immigrant communities in electorally influential areas of economic decline – a view which makes sense only if economic concerns affect attitudes. The *Economist* (Vol. 355, 2000), in an editorial sympathetic to relaxed immigration policies into Europe, bluntly summarises the hostile sentiments that form a barrier to implementation of such policies: "These new arrivals are popularly perceived as welfare-scroungers, job-snatchers and threats to stability". Simon (1989) provides a history of anecdotal evidence on public opinion towards further immigration, where both welfare considerations and labour market fears are the two major concerns. Typical and representative is the response of the (then) French prime minister Jacques Chirac to a 1985 interview question from the daily paper *Liberation* regarding the existence of a link between the number of immigrants and the economic situation: "Naturally. If there were fewer immigrants, there would be less unemployment,

fewer tensions in certain towns and neighbourhoods, and lower social cost."

Simple economic models show that these public concerns may not be entirely unfounded for some groups in the population. Although immigration may be welfare enhancing for the population as a whole, it could have detrimental effects on wages of native workers in the same labour market segment. According to Borjas (1999) [Chapter 4], the weak empirical support for these adverse effects is due to the fact that natives respond to immigration by migrating to economically more favourable areas, thus transmitting the effects of immigration to the entire economy. He concludes that "particularly those at the bottom of the skill distribution have much to fear from the entry of large numbers of immigrants."

Whether misguided or not, labour market fears, or concerns about the welfare system, may manifest themselves in hostile opinions against the immigration of population groups which are considered to be competitors for these resources. To identify the relative importance of these sources of a negative inclination towards further immigration seems crucial for assessing the efficacy of political responses. Furthermore, identification of the sources of hostility may help to identify groups in the native population whose concerns need to be addressed most urgently. For instance, if hostility is related to poor economic conditions (like unemployment), improving these conditions has effects over and above those of immediate interest.

Opposition to ethnic minority immigration may not only be motivated by labour market or welfare concerns, but also by racial prejudice. These prejudices may arise from various sources. They may be fueled by a fear of loss of national characteristics or a taste for cultural homogeneity. There is ample evidence that deeply rooted hostility exists towards immigration groups with

largely different cultural and ethnical background and this hostility manifests itself in remarks of politicians and opinion leaders. For instance, the then opposition leader and future British Prime Minister Margaret Thatcher referred in a 1978 television interview to a British fear of being "rather swamped by people with a different culture" (Layton-Henry, 1992, p. 184). The tone of recent UK debate over asylum seekers, with recurrence of the language of "flooding" and "swamping," drew condemnation from the United Nations High Commissioner for Refugees (April 8, 2000).

In fact, the third issue in the historical debate over migration policy in the US is, according to Borjas (1999), how well immigrants assimilate. This reflects the view that the preservation of cultural homogeneity is a major concern. While these motives for prejudices are defined by some specific concerns, there may be, in addition, deeper racist motives which are based on believes of superiority and inferiority of individuals with certain ethnic origins. Racial prejudice is likely to be related to the ethnic origin of immigrants, and may be more pronounced, the more dissimilar the immigrant population is ethnically and culturally.

So far, there is little quantitative empirical research contributing to our understanding about the nature of attitudes towards minority related issues and immigration questions. We are aware of no work which attempts to quantify the relative effects of labour market concerns and welfare considerations on the one side, and racial prejudice on the other, on attitudes towards further immigration.

The discussion above suggests that racial prejudice, labour market fears, and welfare concerns are the three main factors which contribute to negative attitudes towards further immigration. The discussion also implies that at-

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titudes of majority individuals towards further immigration may be related to their economic situation, their educational background, and their labour market status. In other words, the contribution of labour market fears as well as welfare concerns should be more pronounced for those who are most directly affected by competition of migrant workers. Also, the contribution of racial prejudice should be most apparent for immigrant populations who are ethnically and culturally more distinct from the majority population.

In this paper, we attempt to separate the relative effects of these three components on the attitudes towards immigration: racial prejudice, labour market fears, and concerns about the welfare system use. We base our analysis on various waves of the British Social Attitude Survey, which asks questions about attitudes towards immigration from different minority groups, including some more and some less ethnically similar to the indigenous population. The survey provides also information about attitudes towards related concerns, like job security and benefit expenditures. This information allows us to explore the components of attitudes towards immigration. For this purpose, we specify and estimate a multiple factor model which imposes some structure on our problem. Correlations between answers to questions on immigration and on related issues will help separate different aspects to attitudes. Comparison of answers regarding immigration from different sources will help establish the plausibility of interpretation of remaining factors as involving racial attitudes.

The structure of the paper is as follows. Section 2 reviews some theoretical issues regarding the economic and cultural impact of immigration on interests of different groups in the population. The data we use are described in section 3. Section 4 outlines our econometric model, and explains estimation and

identification of the parameters. Section 5 presents and discusses results, and section 6 concludes.

2 Some Theoretical Considerations

Attitudes towards immigration are strongly related to the way individuals from the majority population perceive the effects of immigration on the economy. As we have outlined above, there is little empirical evidence which suggests that the impact of immigrants on wages and employment is negative. In fact, basic economic considerations suggest that immigration restrictions, like any constraint on trade, prevent welfare enhancing economic transactions. Also, some theoretical models come to the conclusion that immigration may have positive rather than negative employment effects (see, for instance, Ortega (2000)). The way individuals form their views about the effects of immigration however is likely to be based on much simpler considerations, and relates to basic intuitions about labour market equilibria. These perceptions may be best represented by simple equilibrium models.

There exists a large literature which analyses the effects of immigration on the welfare of the native population. The structure of these models can be quite simple, and they may mirror the way individuals from the majority population assess the effects of immigration. Immigration from different source countries may be associated with different consequences by the host country population. Furthermore, these consequences may be of different relevance to natives in different segments of the labour market, and different regions of the country.

To be more specific, the impact of immigration in these models depends

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on the ways in which the immigrant population differs from the native population. Suppose that immigrants are identical to natives in all characteristics, including their capital endowment, demographic and racial composition, and their skill mix. Even in this case, immigration will increase population density, which may have consequences for natives, for instance, in increasing pressure on the housing market. Also, if land is an input to production, it could potentially change input prices.

Suppose now that immigrants have different capital endowments to natives. Then immigration changes the capital-labour ratio, which ought, depending upon the nature of the wage setting mechanism, to affect either or both returns to labour, or the level of unemployment. This will affect individuals differently, depending upon their position in the labour market, particularly their perceived job security. Increases in unemployment will also affect those in work through tax payments if it results in higher costs in the benefit system. In so far as immigrants from different sources are expected to carry different capital endowments this could give reason for different native attitudes to immigration from different origins.

Immigrants may also differ from natives in their human capital. If the skill mix among immigrants differs from that of natives then one would expect immigration to lead to changes in the relative returns to different skill groups or to changes in the relative rates of unemployment. The details here are theoretically far from straightforward, depending upon patterns of complementarity and substitutability between different skills in production. However, the intuition behind these models is easily understood, and reflects probably the way people in different skill groups form their concerns about immigration. The inflow of immigrants should decrease the wages of work-

ers in the same labour market segment, and increase wages of workers who are complementary. This suggests that there are reasons for individuals in different skill groups to have different concerns. For instance, it seems natural to expect the uneducated to be more fearful of the effects of low skill immigration.

A further dimension of difference may be the demographic composition. Borjas (1997), for example, has drawn attention to the possible impact of immigration on dependency ratios, and the consequent effects on cost of the benefit and social security systems. Borjas (1999, chapter 6) provides evidence that in the US, immigrants received a disproportionately large share of the welfare benefits distributed. Immigration may also have effects on the financing of the educational or health system. Concerns that immigrants constitute a heavy burden to the welfare system may therefore contribute to the public opinion that immigration ought to be restricted.

Finally, immigrant populations are often culturally and racially different from the native population. The impact on ethnic and cultural diversity may be either welcomed or not. Cultural and ethnic distance may severely hinder the social assimilation process, and this may be considered as inducing social tensions and costs, likewise contributing towards resistance of immigration.

As the discussion indicates, there are reasons to believe that the attitudes of majority individuals towards further immigration are determined by labour market fears, welfare concerns, and reasons which are motivated by the cultural and ethnic difference of the migration population. The discussion also suggests that the extent to which these dimensions contribute towards attitudes to immigration may depend on the economic position of the individual, as well as the ethnic and cultural origins of the migrant populations

considered.

In our analysis below, we argue that most of these perceived effects can be seen as operating through one or other of three main dimensions: attitudes to race, to job security, and to welfare costs.

3   Data and Descriptives

Our attitudinal data is drawn from 8 years of the British Social Attitudes Survey (1983, 1984, 1985, 1986, 1987, 1989, 1990, 1991). We use the data for England and concentrate on white respondents only.[1]

The survey has extensive socioeconomic information on respondents, including education, income, age, religion, and labour market status. In Table (1) we report summary statistics. We use two variables describing the characteristics of the locality of residence: the unemployment rate, and the concentration of ethnic minorities. In both cases, we measure these variables at the county level to minimise endogeneity issues arising from location choice (see Dustmann and Preston (2000)).[2]

The individual's own characteristics include their income situation, labour market characteristics, education, age, sex, and religious beliefs. The household income variable is reported in banded form in the data. Rather than calculating a continuous measure in units of income, we have computed the average percentage point of households in that band in the income distri-

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[1]Attitudes of ethnic minority individuals towards their own communities, or towards other ethnic minorities, are likely to be driven by different mechanisms. While it might be interesting to investigate their attitudes, the sample sizes within the BSA become very small when considering attitudes of minorities only.

[2]*County* is an administrative unit, covering on average 1.27 m people.

Table 1: Sample Statistics

Variables	Mean	StdD
Unemployment rate, County level	0.0437	0.0203
Ethnic minority concentration, county	0.0262	0.0285
Rank in Income Distribution	0.5008	0.2877
Manual worker	0.4555	0.4980
Ever unemployed	0.1687	0.3745
Ever long term unemployed	0.0609	0.2392
Female	0.5368	0.4986
High Education Level	0.1017	0.3022
Low Education Level	0.4991	0.5000
Age	45.936	17.706
Catholic	0.1005	0.3007
No religion	0.3462	0.4757

bution, for the specific year in which the individual is interviewed. When thinking about the effect of income on attitudes, we have in mind the effect of the relative position of the individual in the income distribution, rather than some absolute income measure. Our definition of household income seems therefore quite natural in this context.

The average age of individuals in the sample is about 46 years. Age is likely to affect attitudes for several reasons. First, it is a direct measure of life experience, which bears a strong effect on attitudes. Second, it marks the position of the individual in their economic cycle. At some stages of this cycle, individuals' attitudes may be more strongly affected by economic considerations. Finally, the age variable captures cohort effects.

We also include dummy variables indicating whether the individual is a

manual worker, has ever been in unemployment, either short or long term, and is female.

We classify people into three education categories. We allocate individuals to the high education category if they remained in education beyond age 18, and to a low education category if they did not remain in school beyond either age 15, or the compulsory school leaving age (whichever is earlier). Education is likely to affect attitudes for several reasons. Higher education may shape attitudes by exposing the individual to a wider range of views. Education is also likely to pick up aspects of peoples' long term economic prospects which are not captured by the before mentioned variables.

We have also added two variables on religious beliefs, reflecting whether the individual is Catholic, or not religious. Attitudes may be influenced both by the high weight placed by many religions on the virtue of tolerance but also by any tendencies to particularism that may be associated with specific creeds. It is also possible that religious affiliation may reflect historic experiences of persecution of particular groups of the population. The majority of Christian religious individuals belong to Protestant churches.

Our ultimate interest is in understanding the factors which affect the attitudes towards immigration. The BSA survey asks for several years questions concerning opinions about immigration from different origin countries. Specifically, distinctions are drawn between immigration from the West Indies, from India and Pakistan,[3] from other countries in the European common market, and from New Zealand and Australia.[4] We create binary variables

[3]Throughout the paper, we refer to this source of immigration as "Asian", in line with wording typically used in the BSA.

[4]The wording of these questions changed in 1991. Therefore, we restrict our analysis to the surveys before 1991.

Table 2: Migration attitudes, different segments

	All	Manual	Non-Manual	High Ed.	Medium Ed.	Low Ed.
Response	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
West Indian	66.46	69.48	65.56	50.45	55.05	70.36
Asian	70.58	75.08	68.46	50.36	68.90	75.61
European	46.21	51.19	43.19	30.80	44.91	50.09
Australians, New Zealand	33.19	34.63	32.96	27.17	35.38	33.62

Response variable: 1 if prefers less settlement of respective population group.

Respondents: white.

for all these responses. In Appendix B, we report the full wording of the original questions and some summary statistics.

In table (2) we report responses to these questions for different education groups, and for manual and non manual workers.

The numbers indicate that the vast majority of respondents oppose further settlement of ethnically different populations (the first two rows in the table), with manual workers having a slightly more negative attitude than non-manual workers. Across education groups, there is a clear tendency towards a more hostile attitude the lower the educational background of the worker. For all potential immigrant populations, the same pattern is evident, but attitudes towards further immigration become more friendly, the less ethnically different the immigrant population. For Australians and individuals from New Zealand, there is no majority of respondents in any group favouring less settlement.

To decompose these attitudes into the three factors we have discussed

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above, we use an array of questions which are specific to the suggested underlying concerns of respondents. In particular, questions related to race comprise opinions on inter ethnic marriage, acceptability of an ethnic minority superior at work, and self rated prejudice against minorities. Questions related to labour market concerns include fear of job loss, perception of job security, perceived ease of finding a new job, and expectations of wage growth. Finally, questions related to welfare concerns cover opinions on generosity of benefits, needs of welfare recipients, and preparedness to pay higher taxes to expand welfare provision. Again, the exact wording of the questions and summary statistics are given in Appendix B.

Not all of these questions were asked in every year. The number of usable responses to each question in each year is summarised in Appendix A in table A1, where usability is determined by availability of data on both regressors and dependent variables. In our estimation procedures, we make maximum use of the available data. All observations covered in table A1 are used.

4 Econometric Specification

4.1 Model Specification

The model we specify is a multifactor model. We intend to relate the attitudes towards immigration by various ethnic groups (including West Indians, Asians, Europeans, and Australians) to three factors: a racial factor, a factor concerning labour market fears, and a factor regarding welfare concerns. We also allow these attitudes to vary across individuals according to other observed characteristics.

We observe only discrete responses to the immigration questions y_i and

we assume corresponding latent variables y_i^*:

$$y^* = f\,\Lambda \,+\, X\,A \,+\, u\,, \tag{1}$$

where y^* is an $n \times m$ matrix of latent attitudinal responses to m immigration questions for n individuals, and A is a $k \times m$ matrix of conditional responses of attitudes to k other observed characteristics X. The matrix f is an $n \times p$ matrix of factor scores capturing the p underlying dimensions to attitudes towards immigration, and Λ is a $p \times m$ matrix of factor loadings, which map the factor scores into the attitudinal responses. We assume that the error terms in the $n \times m$ matrix u are normally distributed, with $u \sim N(0, \Sigma_u)$, and uncorrelated with either X or f.

The factors are themselves assumed to be influenced by the regressors X:

$$f \,=\, X\,B \,+\, v\,, \tag{2}$$

where B is a $k \times p$ matrix of coefficients in the underlying lower dimensional model. We assume that $v \sim N(0, \Sigma_v)$. The assumption that u is uncorrelated with X or f implies that u and v are not correlated.

We can not directly observe these factors; instead, we observe an array of responses to q questions on issues which are each strongly related to one or other of these factors. These include three sets of questions. First, questions indicating racial attitudes: specifically, attitudes towards inter ethnic marriage, having a minority boss, and self admitted prejudice against minorities. Secondly, there are question regarding labour market security: specifically questions on fear of job loss, ease of finding a job and expected future wage paths. Thirdly, there is a set of questions indicating welfare concerns, including a question on adequacy of benefit levels, perception of recipients' need,

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and willingness to pay for increased public social spending. Again, only discrete outcomes on these variables are observed. The latent indices relate to the factors as follows:

$$z^* = f\,M + X\,C + w\,,$$ (3)

where z^* is a $n \times q$ matrix of latent responses, M is a $p \times q$ matrix of factor loadings, C is a matrix of conditional responses to X, and w is an $n \times q$ matrix of error terms, which are distributed normally, with $w \sim N(0, \Sigma_w)$. As with u, w is assumed uncorrelated with X and f and therefore also with v. The assumption of block diagonality on M will prove crucial to identification.

This structure implies an estimable reduced form, which can easily be obtained by substitution. Let Y^* denote the stacked vector of latent responses, $Y^* = \begin{pmatrix} y* \\ z* \end{pmatrix}$. We then obtain

$$Y^* = X\,\Gamma + \epsilon\,,$$ (4)

where

$$\Gamma = B \begin{pmatrix} \Lambda \\ M \end{pmatrix} + \begin{pmatrix} A \\ C \end{pmatrix} \equiv \begin{pmatrix} \Gamma_1 \\ \Gamma_2 \end{pmatrix}$$ (5)

is the $(m+q) \times k$ matrix of reduced form coefficients and

$$\epsilon = v \begin{pmatrix} \Lambda \\ M \end{pmatrix} + \begin{pmatrix} u \\ w \end{pmatrix}.$$

Then $\epsilon \sim N(0, \Sigma_\epsilon)$, where

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$$\Sigma_\epsilon = \begin{pmatrix} \Sigma_u + \Lambda\,\Sigma_v\,\Lambda' & \Sigma_{uw} + M\,\Sigma_v\,\Lambda' \\ \Sigma'_{uw} + \Lambda\,\Sigma_v\,M' & \Sigma_w + M\,\Sigma_v\,M' \end{pmatrix} \equiv \begin{pmatrix} \Sigma_{11} & \Sigma_{12} \\ \Sigma'_{12} & \Sigma_{22} \end{pmatrix} \qquad (6)$$

is the $(m+q) \times (m+q)$ variance-covariance matrix of the reduced form residuals and Σ_{uw} denotes $E(uw')$.

4.2   Estimation

Our estimation strategy proceeds in two stages.[5] The reduced form (4) has two kinds of parameters: Coefficients Γ and variance-covariance parameters Σ_ϵ. In stage 1, we estimate the coefficients of each equation (corresponding to the rows of Γ) separately by independent (ordered) probits. In the second stage, we take each pairing of questions successively and estimate the corresponding off-diagonal component of Σ_ϵ by bivariate maximum likelihood, fixing the coefficients of the two equations concerned at the values estimated at the previous stage. [6]

Computation of the variance-covariance matrix of the parameters is described in full in the Appendix. The argument follows the standard procedure of expanding the score vector. The only complication which arises in our case is the use of different likelihoods at different points in the estimation procedure. We follow Muthén (1984) in resolution of the problems that this raises.

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[5]All programs are written in GAUSS by the authors.

[6]Not all of the questions used are asked in every year of our sample but there is sufficient overlap to identify all reduced form parameters. We require each possible pair of questions to be asked at least once in the same year.

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We then impose the restrictions in (5) and (6) in a further step by minimum distance. The estimation procedure outlined above does not, however, guarantee positive semi definiteness of the estimated asymptotic variance - covariance matrix for the parameter estimates $\hat{\mathbf{\Omega}}$ (see Appendix for derivation). In practice, we find $\hat{\mathbf{\Omega}}$ to have a few small negative eigenvalues. It can therefore not be used as the weighting matrix. We chose as an alternative weighting matrix the diagonal matrix $\mathrm{dg}(\hat{\mathbf{\Omega}})$ containing the diagonal elements of $\hat{\mathbf{\Omega}}$.[7] Since this is not the optimal weighting matrix the minimised value of the criterion does not give the standard χ^2 test of the restrictions so we use the formula in Newey (1985).

4.3   Identification

Identification is poorly understood in these types of models (see Maddala (1983) and Muthén (1979)). We provide a heuristic discussion which establishes identification in our case.

Note that because of the discrete nature of the dependent variables we can estimate only the ratios of the elements of Γ to the standard deviations of the associated components of ϵ. Likewise we can estimate only the matrix of correlations associated with Σ_ϵ. We adopt the identifying normalisation that the diagonal elements in Σ_u and in Σ_w are such as to make the diagonal elements of Σ_ϵ equal to unity.

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[7] Another idea would be to use the positive semi definite matrix obtained from $\hat{\mathbf{\Omega}}$ by replacing the negative eigenvalues by zeros in the spectral decomposition. We found this to give very unstable results.

4.3.1   Identification of M and Σ_v

Fundamental to our procedure is the use of the indicator questions to locate variation in the factors. Identification of M and Σ_v are therefore crucial. We achieve this through the assumptions that each of our indicator questions is indicative of one and only one factor and that all correlation between responses to these questions (conditional on the regressors X) is accounted for by the factor structure.

Specifically, we assume firstly that M is a block diagonal matrix, with only one non-zero element in each row. That is to say, we assume that each response in z^* is indicative of one and only one factor. Secondly, we assume diagonality of the Σ_w matrix, so that all correlation between these responses is accounted for by the factor structure. Finally, we set the diagonal elements of Σ_v to unity, which is simply a normalising assumption. These parameters are then identified by the restriction $\Sigma_{22} = \Sigma_w + M\,\Sigma_v\,M'$.

The elements of M, which are the loadings of the factors on the indicator questions, are identified from the conditional correlations between responses *within* blocks. Remembering the particular block diagonal structure of M, suppose that the ith block has q_i elements. Then there are $q_i\,(q_i - 1)/2$ off-diagonal elements in the corresponding block of Σ_{22} from which to identify them. This is sufficient only if $q_i \geq 3$. This is so for each block in our case.

Having identified M, the off-diagonal elements of Σ_v are then identified without further restriction from the remaining elements of Σ_{22}, that is to say from the correlations between elements in different blocks. Notice that we allow for correlation between the factors since Σ_v is not required to be diagonal. Since all conditional correlation between responses in different blocks is assumed to be driven solely by the correlation between factors considerable

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overidentifying restrictions are involved at this point.

4.3.2   Identification of Λ

Now consider identification of the main parameters of interest, Λ. There is more than one possibility here. Our favoured approach is to identify these parameters from the conditional correlations between answers to the indicator questions and the questions on immigration under the assumption that this is driven solely by the role of the hypothesised factors.

Specifically, we set $\Sigma_{uw} = 0$ and use $\Sigma_{12} = M \Sigma_v \Lambda'$. That is to say, we assume that all conditional correlation between responses to the immigration questions and the indicator questions is accounted for by the factors of interest. With M and Σ_v identified elsewhere, this is sufficient to identify Λ if $p \leq q$, which is to say that there are fewer factors than indicator questions - a basic assumption.

An alternative approach which would work in some cases, though not in this case, and which we would not favour anyway, would be to assume diagonality of Σ_u and use the restriction $\Sigma_{11} = \Sigma_u + \Lambda \Sigma_v \Lambda'$. This alone gives only $m(m-1)/2$ reduced form parameters from which to identify the mp parameters in Λ and is therefore sufficient only if $p \leq (m-1)/2$. This is not so in our example. Besides, this seems to us a less desirable restriction to impose. We do not wish to exclude the existence of other sources of correlation between immigration responses, provided they are orthogonal to the factors of interest.

4.3.3 Identification of B

Besides knowing the contribution of the three factors to determination of attitudes to immigration we would also be interested to know the role of the regressors X in determining the factors. If we assume, for example, that correlation of responses to the indicator questions with the regressors arises only from the role of the regressors in driving the factors then we can identify B from the relevant block of the estimated reduced form coefficients Γ.

In other words, knowing M or Λ, we can identify B from Γ but only under further assumptions on the matrices C or A. For instance, we can assume $C = 0$ and use $\Gamma_2 = BM$ or assume $A = 0$ and use $\Gamma_1 = B\Lambda$. Note that if we use the first to identify B then A is plainly estimable. While identification of B is interesting, it should be stressed that failure of any of these conditions (as experienced below) would in no way compromise identification of Λ which relies on no assumption about A or C.

5 Results

In the first step, we estimate independent probits on each of the attitude questions. This provides estimates of Γ in (4). The coefficients of the fourteen independent probits, estimated for the sample of all respondents, are reported in Tables A2-A5. They are grouped according to their relevance either to attitudes regarding immigration or to the three hypothesised underlying factors.

The residual correlation matrix estimated at the second stage through pairwise bivariate maximum likelihood techniques, which corresponds to Σ_ϵ in (6), is shown in Table A6. It is from the elements of this matrix that our

main parameters of interest M, Σ_v and Λ are to be identified.

After having obtained estimates of Γ and Σ_ϵ, we impose restrictions in a final minimum distance stage. As we have discussed above, there are various strategies to identify the model. The identifiable parameters depend on the restrictions we are willing to impose at this stage. We impose increasing restrictions on the coefficients in Tables A2-A6 so as to estimate successively larger sets of underlying parameters.

We first discuss results we obtain for the full sample. We then split the sample according to skill and educational groups. These results are discussed further below.

5.1 The full sample

In Table (3) we report results where we impose only the substantive assumptions of block diagonality on M, and diagonality on Σ_w to identify the indicator loadings in M and the correlations between factors in Σ_v. As can be seen the restrictions are comfortably accepted according to the Newey χ^2 test. The common signs of the factor loadings within blocks in the matrix M are consistent with the desired interpretation.

The coefficients which reflects the conditional correlation between the three factors are displayed in the matrix Σ_v (Table (4)). Note the significant conditional correlations between antipathy to welfare spending and both racial prejudice and low job insecurity. Allowing for such correlation by not enforcing diagonality on Σ_v is seen here to be potentially important to unbiased estimation.

We now add the restriction $\Sigma_{uw} = 0$ and use $\Sigma_{12} = M \Sigma_v \Lambda'$ to identify the main parameters of interest, Λ. We report the estimates of the parameters

Table 3: All respondents, Minimum distance, Matrix M

Variable	Race		Jobs		Welfare		$\mathrm{diag}(\Sigma_w)^*$
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff
Marriage	0.763	17.27	–	–	–	–	0.418
Boss	0.841	16.49	–	–	–	–	0.292
Prejudice	0.780	18.71	–	–	–	–	0.391
Job Loss	–	–	0.472	5.79	–	–	0.778
Find Job	–	–	0.377	5.04	–	–	0.858
Wage	–	–	0.139	2.01	–	–	0.981
Job security	–	–	0.773	6.73	–	–	0.402
Benefits	–	–	–	–	0.678	14.82	0.541
Need	–	–	–	–	0.722	16.06	0.478
More Spending	–	–	–	–	0.497	12.86	0.753

Restrictions imposed: $\Sigma_{22} = \Sigma_w + M\,\Sigma_v\,M'$

* Uniqueness; Proportion of Residual Variation unique to respective attitude.

Table 4: All respondents, Minimum distance, Matrix Σ_v

Variable	Race		Jobs		Welfare	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Race	1.000	1.00	0.002	0.03	0.321	6.81
Jobs	0.002	0.03	1.000	1.00	-0.284	-3.89
Welfare	0.321	6.81	-0.284	-3.89	1.000	1.00

Restrictions imposed: $\Sigma_{22} = \Sigma_w + M\,\Sigma_v\,M'$

Newey $\chi^2_{32} = 40.463$ P-value $= 0.145$

Table 5: All respondents, Minimum distance, Matrix Λ

Variable	Race		Jobs		Welfare		diag(Σ_u)*
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff
West Indian	0.471	11.25	0.158	2.20	0.180	2.90	0.682
Asian	0.540	11.36	0.159	2.09	0.219	3.23	0.578
European	0.119	3.23	0.122	1.64	0.129	2.17	0.953
Aust.,N.Z	0.003	0.08	0.116	1.56	0.091	1.49	0.984

Restrictions imposed: $\Sigma_{22} = \Sigma_w + M \Sigma_v M'$, $\Sigma_{12} = M \Sigma_v \Lambda'$

Newey $\chi^2_{60} = 62.515$ P-value $= 0.387$

* Uniqueness; Proportion of Residual Variation unique to respective attitude.

in Λ in Table (5). The over identifying restrictions are again accepted at usual significance levels. This suggests that it may not be inappropriate to think that the conditional correlations between the immigration responses and responses to the indicator questions can be accounted for through the supposed factor structure.

The most striking result is the strength, both quantitatively and statistically, of the impact of racial attitudes on hostility to immigration from the West Indies or from Asia. There is some evidence of a similar component to attitudes towards European immigration but not to immigration from Australia and New Zealand. This pattern of responses clearly fits very well with the proposed interpretation.

Estimated effects from job insecurity are weaker but there do appear to be significant positive effects on attitudes to immigration from the West Indies and Asia though much less as regards immigration from Europe or the antipodes. Hostility to welfare spending seems similarly correlated.

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Overall none of the factors seem to have any obvious bearing on attitudes to immigration from Australia or New Zealand. The figures in the last column can be interpreted as the proportion of the residual variance which is not associated with the factors. For immigration from the more ethnically distinct sources, from one half to two thirds of the residual variance remains unaccounted for in terms of the factor model. For immigration from Australia and New Zealand, almost all remains unaccounted for.

These findings tend to suggest that racial prejudice is by far the most important component explaining negative inclinations towards immigration of ethnically different populations. Although labour market fears and welfare concerns are found to have a significant impact, their effects are much lower than that of the racial factor. For ethnically and culturally more similar groups (i.e. Europeans), the picture is very different. Now the estimated contributions of welfare and job concerns are as strong as those of racial prejudices. As regards the final group of Australians and New Zealanders, who are typically culturally very similar and ethnically hardly distinguishable from the majority population, none of these factors seems associated with negative attitudes towards further immigration. Note that the overall response towards these populations is more friendly than towards other groups (see Table (2)), but nevertheless, more immigration is opposed by about 30 percent of the majority population.

5.2   Skill and Education Groups

Our discussion above suggests that individuals in different sectors of the labour market, or of different skill levels, may have reasons to view immigration differently. It has often been argued that manual workers, as well as

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less skilled workers, are more vulnerable to low skilled immigration (Borjas 1999). If so, then one might expect that this would show up in a difference in the factors driving attitudes of workers in distinct labour market segments.

Our simple summary statistics on the attitude responses, split up in different labour market groups, indicate that attitudes towards further immigration tend to be more hostile among manual than non-manual workers; furthermore, hostility decreases with educational background. Although our analysis above takes account of variables describing these segments by incorporating them as regressors, we now estimate separate systems for the different groups. We estimate separate reduced forms for the different subgroups (for example, manual and non-manual workers). We then impose the model restrictions by minimum distance, retaining the assumption of common M and Σ_v matrices, but allowing all coefficients of the Λ matrix to vary between population subgroups. The restrictions imposed are $\Sigma_{22i} = \Sigma_w + M \Sigma_v M'$ and $\Sigma_{12i} = M \Sigma_v \Lambda_i'$, where i corresponds to the subgroups (for example, manual and non manual). These are typically the strongest restrictions accepted and allow identification of Λ_i.[8]

Manual and non-manual workers

We report results of the coefficients in Λ_i for manual and non-manual workers in Table (6). The restrictions imposed are clearly accepted. These results indicate that the impact of racial prejudice remains strong amongst manual workers. The influence of the other two components is very small, and estimates are very imprecise. Again, the racial factor is important for attitudes

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[8]We restrict the sample to the employed. This has almost no effect on results and we do not provide a separate Table for these.

Table 6: Manual and Non-Manual Employed, Minimum distance, Matrix Λ

Variable	Race		Jobs		Welfare		diag(Σ_u)
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff
	Manual						
West Indian	0.482	5.64	0.130	0.80	0.089	0.69	0.721
Asian	0.551	5.76	0.137	0.68	0.086	0.59	0.645
European	0.132	1.93	0.116	0.71	0.130	1.15	0.950
Aust.,N.Z	-0.035	-0.47	-0.017	-0.10	0.109	0.90	0.988
	Non-Manual						
West Indian	0.442	6.80	0.235	1.80	0.310	3.04	0.607
Asian	0.483	6.86	0.308	2.54	0.416	3.90	0.443
European	0.073	1.22	0.226	1.74	0.197	2.19	0.923
Aust.,N.Z	-0.010	-0.14	0.238	1.72	0.117	1.19	0.948

Restrictions imposed: $\Sigma_{22i} = \Sigma_w + M\,\Sigma_v\,M'$, $\Sigma_{12i} = M\,\Sigma_v\,\Lambda_i'$

Newey $\chi^2_{133} = 150.833$ P-value $= 0.138$

towards further immigration from Asia and the West Indies, less important for Europe, and vanishes for Australia/New Zealand.

For non-manual workers, the influences of the race factor remain strong, but the relative importance of labour market concerns and welfare concerns increases. For the first two immigration groups, the effect is of a magnitude approaching that of the racial factor. For Europeans, job and welfare concerns are strong, while the racial factor practically vanishes. For Australians and New Zealanders, the influence of the race factor is also zero, but there is now some evidence of the presence of welfare and job factors.

It is perhaps surprising that welfare and labour market concerns have a negligible impact on the opinions of manual workers towards any of the

immigrant populations, in sharp contrast to the non-manual workers. The strong presence of the racial component for this group may be an indication that the process of opinion formation is being based on simpler prejudicial perceptions rather than more elaborate opinions about the impact or consequences of immigration. To further investigate these issues, we now split up the sample into three education groups.

Low, medium, and high education

We refer to the three education groups as low education, medium education, and high education according to the age at which the respondent left full time education. Results for the coefficients in the Λ_i matrices are displayed in Table (7). The very high P-value indicates that the restrictions are very comfortably accepted.

Racial factors are influential in all the three groups, though most strongly in the group with lowest education. This is the only group in which racial factors seem relevant to European immigration. Labour market concerns are evident only for the highest education group, and welfare concerns only for the high and medium education groups. The relative importance of economic as against racial factors has a clear education gradient, figuring more prominently the higher the education level of the subsample considered.

These results conflict with the common expectation that it is hostility towards immigration amongst the least skilled and least educated that is driven by economic concerns. In fact, our results indicate that it is the views of the most educated that are most influenced by economic factors.

Table 7: High, medium, and low education, employed, Minimum distance, Matrix Λ

Variable	Race		Jobs		Welfare		diag(Σ_u)
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff
High Education							
West Indian	0.385	1.84	0.666	1.91	0.742	2.50	0.019
Asian	0.411	2.15	0.696	2.08	0.790	2.62	-0.103
European	-0.005	-0.03	0.539	1.53	0.497	1.83	0.645
Australian	-0.024	-0.15	0.460	1.43	0.433	1.61	0.741
Medium Education							
West Indian	0.429	4.28	0.235	1.17	0.338	2.29	0.613
Asian	0.445	4.49	0.262	1.32	0.435	2.85	0.505
European	0.078	0.94	0.237	1.13	0.275	1.85	0.893
Australian	0.043	0.48	0.242	1.06	0.093	0.64	0.944
Low Education							
West Indian	0.498	7.94	0.096	0.67	0.076	0.74	0.718
Asian	0.574	7.40	0.112	0.65	0.113	0.93	0.615
European	0.127	2.47	0.089	0.59	0.064	0.71	0.971
Australian	-0.034	-0.62	0.039	0.26	0.074	0.78	0.995

Restrictions imposed: $\Sigma_{22i} = \Sigma_w + M\,\Sigma_v\,M'$, $\Sigma_{12i} = M\,\Sigma_v\,\Lambda'_i$

Newey $\chi^2_{206} = 164.527$ P-value $= 0.985$

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5.3 Explaining the factors

The coefficients in B measure the impact of individual characteristics on the three factors (see equation (2)). As explained above, it is possible to identify these parameters from the reduced form coefficients of the race, jobs and welfare equations only if we are willing to accept the restriction $C = 0$, which is to say that any non-factor driven aspects to these questions are uncorrelated with the regressors (see equation (3)). This would mean that we could impose the restriction $\Gamma_2 = B\,M$. Furthermore, we can impose this restriction column by column, identifying the coefficients relating to any one factor, even if the restriction fails for the other two factors.

Unfortunately, in practice we find the restrictions strongly rejected, either jointly, or independently. Table (8) reports the full set of results when imposing the additional restrictions on these columns independently for the full sample. The Newey tests indicate that the restrictions are strongly rejected in each case. We stress nonetheless that this in no way undermines the identification of the M and Λ parameters in the previous sections, which does not rely on the restrictions rejected here.

It may nevertheless be worth noting the estimates of B which may be indicative of the main forces driving the three aspects to attitudes. The estimates indicate that racial hostility is positively associated with ethnic concentration at county level. At the individual level hostility appears to be lower for the highly educated, the young, Catholics, those on low incomes and women. These results are compatible with the broad picture suggested in Dustmann and Preston (2000).

Perceptions of job insecurity are strongest amongst poorer, older, female, manual workers with low or medium education, and experience of unemploy-

Table 8: All respondents, Minimum distance, Matrix B

Variable	Race		Jobs		Welfare	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Unemployment rate	-0.024	-0.02	1.943	1.09	-9.924	-6.81
Ethnic minor. conc.	0.086	4.20	-0.039	-1.12	0.027	1.05
Income Rank	0.359	3.96	-2.344	-9.52	0.632	5.19
Manual worker	-0.049	-1.10	0.153	1.82	-0.136	-2.38
Ever unemployed	0.057	0.90	0.199	1.85	-0.199	-2.18
Ever long term unemp.	-0.030	-0.30	0.296	1.36	-0.217	-1.47
Female	-0.158	-3.91	0.494	5.82	0.103	1.82
Compulsory Education	0.104	2.13	-0.023	-0.27	0.161	2.52
High Education Level	-0.360	-4.85	0.170	1.74	-0.527	-5.44
Age/100	1.061	1.79	-8.674	-5.23	-1.114	-1.47
Age^2/10000	-0.658	-1.09	13.646	6.55	2.398	3.06
Catholic	-0.307	-4.43	-0.047	-0.37	-0.312	-3.65
No religion	-0.011	-0.26	-0.059	-0.78	-0.176	-3.01

Restrictions imposed: $\Sigma_{22} = \Sigma_w + M \Sigma_v M'$, $\Sigma_{12} = M \Sigma_v \Lambda'$,

$\Gamma_2^i = M B^i$, where the superscript i denotes the respective column.

Race: Newey $\chi^2_{86} = 484.93$, P-value=0.000.

Jobs: Newey $\chi^2_{99} = 1043.08$, P-value $= 0.000$

Welfare: Newey $\chi^2_{86} = 449.83$, P-value $= 0.000$

ment. All of these seem obviously sensible findings. Antipathy to welfare on the other hand is strongest among richer, older, Protestant, manual workers, female respondents, those living in areas of low unemployment, and those with no experience of unemployment. Again this seems reasonable.

6   Discussion and Conclusion

It is commonly argued that immigrants may be a burden on welfare and public services, and that immigration may lead to job displacement of native workers (see Borjas 1999 for an example of such arguments or Simon 1989 for a more skeptical view). If these views are shared by large numbers of the public then (independently of whether they are justified) such concerns may be an important component of aversion towards further immigration. If these considerations contribute towards opinions on migration issues, then policies related to labour market security and welfare spending may have important secondary effects on public opinion about and resistance towards further immigration. By way of contrast, if hostility towards immigration is rooted in racial hostility then it may be less responsive to more economic interventions.

In this paper, we attempt to understand the importance of welfare and labour market concerns, as well as racially inclined considerations for the formation of opinions towards further immigration. We use data on attitudes of the majority ethnic community in England to decompose attitudes towards further immigration into a racial component, a welfare component, and a component which reflects labour market concerns. Based on several years of data from the British Attitude Survey, we estimate a multi-stage factor

model, where we use opinions on welfare, racial, and labour market issues as a means to separate attitudes towards further immigration into these three components.

Our results are interesting in several respects. First, we do find evidence that both welfare and labour market concerns matter for the opinion towards further immigration. However, by far the most important single factor appears to be racially motivated opposition.

Second, we find that attitudes towards immigration, and the relative importance of the three factors, differs according to the ethnic origin of the immigrant population concerned. Our data allows us to distinguish between attitudes towards four different origin groups. Our results indicate that a negative attitude towards further immigration is strongly related to all the three factors for Asians and West Indians, while it is less strongly explained for Europeans. The factors we have defined hardly explain at all the attitudes towards Australians and New Zealanders, which suggests that opposition towards immigration from such sources is scarcely linked to any of our systematic factors. The dominant racial factor is particularly strong for the Asian and West Indian population.

Third, we do not find strong evidence that the greater labour market concerns sometimes believed to exist among unskilled and manual workers are reflected in opposition towards further immigration. The underlying supposition of such a belief that potential immigrants are in fact mostly unskilled, selecting themselves into manual jobs, may well be unfounded anyway. We find that welfare and labour market concerns are more closely linked to opinions towards further immigration for non-manual workers than for manual workers, and for the more educated rather than the less educated.

Again, as above, there are for all subgroups distinct differences according to origin country, with racial factors being stronger for ethnically more different populations.

These results conflict with the frequently expressed opinion that greater hostility to immigration amongst the economically more disadvantaged sections of the population is driven by fear of economic competition in labour markets.

On the contrary, we find an association between labour market concerns and hostility to immigration only amongst better educated and more skilled sections of the labour force. Antipathy towards immigration amongst manual and poorly educated workers is associated only and strongly with racial attitudes. This may reflect differences in the process of opinion formation towards immigration depending on levels of education. There are at least two explanations for this: Either education itself makes economic arguments more accessible to those educated, or education attracts those more inclined to think in such terms.

Economic policy interventions, which reduce job insecurity or welfare concerns, appear likely therefore to be effective only in reducing hostility to immigration amongst the better educated and more highly skilled sections of the labour market. Addressing the antipathy to immigration at the lower end of the spectrum of skills and education requires engaging the stereotypes which underlie the racial antagonisms driving these attitudes.

References

[1] Borjas, G., R. Freeman and L. Katz, 1997, How much do immigration and trade affect labour market outcomes?, Brookings papers on economic activity, 1-67.

[2] Borjas, G., 1999, Heaven's Door, Princeton University Press, Princeton

[3] Browne, M. W. and G. Arminger, 1995, Specification and estimation of mean- and covariance-structure models, in: G.Arminger, C. C. Clogg and M. E. Sobel, 1995, eds, Handbook of statistical modelling for the social and behavioural sciences (Plenum Press: New York) 185-249.

[4] Dustmann, C. and I. Preston, 2000, Attitudes to Ethnic Minorities, Ethnic Context, and Location Decisions, Economic Journal, forthcoming.

[5] Layton-Henry, Z., 1992, The Politics of Immigration: Immigration, 'Race,' and 'Race' Relations in Post-War Britain, Oxford: Blackwell.

[6] Maddala, G.S., 1983, Limited dependent and qualitative variables in Econometrics, Cambridge University Press, Cambridge

[7] Muthén, B.O., 1979, A structural probit model with latent variables, Journal of the American Statistical Association, 74, 807-811.

[8] Muthén, B.O., 1984, A general structural equation model with dichotomous, ordered categorical and continuous latent variable indicators, Psychometrika 49, 115-132.

[9] Muthén, B.O. and A. Satorra, 1995, Technical aspects of Muthén's LIS-COMP approach to estimation of latent variable relations with a comprehensive measurement model, Psychometrika 60, 489-503.

[10] Money, J., 1999, Fences and Neighbors: The Political Geography of Immigration Control, Cornell University Press, Ithaca.

[11] Newey, W. K., 1985, Generalized Method of Moments Specification Testing, Journal of Econometrics 29, 229-256.

[12] Ortega, J., 2000, Pareto-improving immigration in an economy with equilibrium unemployment, Economic Journal 110, 92-112.

[13] Simon, J.L., 1989, The Economic Consequences of Migration, Blackwell, Oxford, UK

[14] Studlar, D. T., 1977, Social context and attitudes toward colored immigrants, British Journal of Sociology, 28, 168-184.

[15] United Nations Population Division, 2000, Replacement Migration: Is it a Solution to Declining and Ageing Populations?, www.un.org/esa/population/migration.htm

7 Appendix A: Estimation

We estimate the reduced form in a two stage procedure to obtain estimates of Γ and Σ_ϵ. We estimate Γ by a series of independent (ordered) probits. We then estimate the components of Σ_ϵ by pairwise bivariate Maximum Likelihood, conditional upon the estimated probit coefficients. Not all of the questions used are asked in every year of our sample but there is sufficient overlap to identify all reduced form parameters.

This estimation procedure is similar to that suggested by Muthén (1984) or by Browne and Arminger (1995). Our derivation of the variance covariance matrix for the estimates draws on the arguments of Muthén and Satorra (1995).

Let $\boldsymbol{\theta_1}$ denote the vector of parameters estimated by independent ordered probits in the first stage (which is to say the vector of the elements of Γ) and let $\boldsymbol{\theta_2}$ denote the vector of parameters estimated by pairwise bivariate likelihood maximisation at the second stage (which is to say the vector of all generically distinct off-diagonal elements of Σ_ϵ). Let $\boldsymbol{\theta} \equiv (\boldsymbol{\theta'_1},, \boldsymbol{\theta'_2})'$ denote the vector of all reduced form parameters.

Let $\mathbf{l^i}(\boldsymbol{\theta})$ denote a vector of the same dimensions as $\boldsymbol{\theta}$ the elements of which are the log likelihood contributions of the ith respondent to estimation of the corresponding elements of $\boldsymbol{\theta}$. Note that different likelihoods are used to estimate parameters at different stages and in different equations. Furthermore let

$$\mathbf{l^i}(\boldsymbol{\theta}) \equiv (\mathbf{l_1^i}(\boldsymbol{\theta_1}), \mathbf{l_2^i}(\boldsymbol{\theta_1}, \boldsymbol{\theta_2})')'.$$

define a partition of $\mathbf{l^i}(\boldsymbol{\theta})$ into elements corresponding to first and second stage estimations.

The estimates $\hat{\boldsymbol{\theta}} \equiv (\hat{\boldsymbol{\theta}}_1', \hat{\boldsymbol{\theta}}_2')'$ solve the score equations

$$\sum_i \mathbf{q_1^i}(\hat{\boldsymbol{\theta}}_1) \ \equiv \ \sum_i \frac{\partial}{\partial \boldsymbol{\theta_1}} \mathbf{l_1^i}(\hat{\boldsymbol{\theta}}_1) = \mathbf{0}$$

$$\sum_i \mathbf{q_2^i}(\hat{\boldsymbol{\theta}}_1, \hat{\boldsymbol{\theta}}_2) \ \equiv \ \sum_i \frac{\partial}{\partial \boldsymbol{\theta_2}} \mathbf{l_2^i}(\hat{\boldsymbol{\theta}}_1, \hat{\boldsymbol{\theta}}_2) = \mathbf{0}.$$

Denote by $\mathbf{q^i}(\hat{\boldsymbol{\theta}}) \equiv (\mathbf{q_1^i}(\hat{\boldsymbol{\theta}}_1)', \mathbf{q_2^i}(\hat{\boldsymbol{\theta}}_1, \hat{\boldsymbol{\theta}}_2)')'$ the vector of stacked score contributions for the ith respondent and by $\mathbf{q}(\hat{\boldsymbol{\theta}}) \equiv \sum_i \mathbf{q^i}(\hat{\boldsymbol{\theta}}) = \mathbf{0}$ the score vector.

By the Mean Value Theorem

$$\mathbf{0} = \mathbf{q}(\hat{\boldsymbol{\theta}}) = \mathbf{q}(\boldsymbol{\theta}) + \mathbf{Q}(\tilde{\boldsymbol{\theta}})(\hat{\boldsymbol{\theta}} - \boldsymbol{\theta})$$

for some $\tilde{\boldsymbol{\theta}}$ between $\hat{\boldsymbol{\theta}}$ and $\boldsymbol{\theta}$, where $\mathbf{Q}(\boldsymbol{\theta}) \equiv \partial \mathbf{q}(\boldsymbol{\theta})/\partial \boldsymbol{\theta}$. Therefore

$$\sqrt{n}(\hat{\boldsymbol{\theta}} - \boldsymbol{\theta}) = (-\frac{\mathbf{1}}{\mathbf{n}}\mathbf{Q}(\tilde{\boldsymbol{\theta}}))^{-1}\frac{\mathbf{1}}{\sqrt{\mathbf{n}}}\mathbf{q}(\boldsymbol{\theta}).$$

Since

$$\frac{1}{\sqrt{n}}\mathbf{q}(\boldsymbol{\theta}) \to \mathbf{N}(\mathbf{0}, \mathbf{V}),$$

where $\mathbf{V} \equiv plim\frac{1}{n}\sum_i \mathbf{q^i}(\boldsymbol{\theta})\mathbf{q^i}(\boldsymbol{\theta})'$, and $\hat{\boldsymbol{\theta}} \to \boldsymbol{\theta}$, we have

$$\sqrt{n}(\hat{\boldsymbol{\theta}} - \boldsymbol{\theta}) \to \mathbf{N}(\mathbf{0}, \mathbf{A}^{-1}\mathbf{V}\mathbf{A}'^{-1}),$$

where $\mathbf{A} \equiv \frac{1}{\mathbf{n}}\mathbf{Q}(\boldsymbol{\theta})$.

Note that under standard regularity conditions

$$\hat{\mathbf{V}} \ \equiv \ \frac{1}{n}\sum_i \mathbf{q^i}(\hat{\boldsymbol{\theta}})\mathbf{q^i}(\hat{\boldsymbol{\theta}})' \to \mathbf{V}$$

$$\hat{\mathbf{A}} \ \equiv \ \frac{1}{n}\sum_i \frac{\partial}{\partial \boldsymbol{\theta}}\mathbf{l^i}(\hat{\boldsymbol{\theta}})\frac{\partial}{\partial \boldsymbol{\theta}}\mathbf{l^i}(\hat{\boldsymbol{\theta}})' \to \mathbf{A}$$

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so that we can consistently estimate $\mathbf{V}$ and the block lower triangular matrix $\mathbf{A}$ by taking the outer products of gradients indicated. We can thereby consistently estimate the asymptotic variance covariance matrix of the estimates by $\hat{\boldsymbol{\Omega}} \equiv \hat{\mathbf{A}}^{-1}\hat{\mathbf{V}}\hat{\mathbf{A}}'^{-1}$.

8   Appendix B: Tables

Table A1: Sample Sizes by Year							
Variables	**83**	**84**	**85**	**86**	**87**	**89**	**90**	**Total**
Less West Indian	1140	1051		757		883	804	4635
Less Asian	1156	1060		756		885	804	4661
Less European	1151	1056		756		883	803	4649
Less Australian	1155	1058		754		882	806	4655
Marriage	1186	1113		833		1015		4147
Boss	1199	1117		850		1022		4188
Prejudice	1218	1118	1185	1615	1945	2085	897	10063
Job Loss	1221	1132	1193	1631		2094	1793	9064
Find Job						652		652
Wage Exp	596	578	600	846	976	1058	918	5572
Job Security						590		590
Benefits	1149	1052	1121	1545	1849	1943	1641	10300
Need					923	1820		2743
More spending					924	1825		2749

Table A2: Immigration Probits

Variable	Less West Indian		Less Asian		Less Euro		Less Australian	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Unemployment rate	-0.679	-0.51	-1.611	-1.17	1.098	0.87	-0.564	-0.43
Ethnic minor. conc.	0.007	0.32	0.036	1.46	0.012	0.54	0.019	0.83
Income Rank	0.251	2.50	0.196	1.99	0.039	0.40	0.129	1.34
Manual worker	0.040	0.70	0.111	1.92	0.119	2.26	0.029	0.53
Ever unemployed	-0.032	-0.43	0.000	0.00	-0.013	-0.19	0.030	0.44
Ever long term unemp.	0.051	0.40	-0.055	-0.42	0.021	0.18	-0.144	-1.25
Female	-0.008	-0.16	-0.014	-0.27	0.047	0.97	0.015	0.30
Compulsory Education	0.098	1.68	0.168	2.81	0.101	1.85	0.013	0.24
High Education Level	-0.422	-5.10	-0.487	-5.75	-0.328	-3.97	-0.298	-3.40
Age	1.637	2.28	0.911	1.24	3.096	4.66	4.523	6.38
Age^2	-0.733	-0.98	-0.319	-0.42	-2.693	-3.97	-5.125	-7.05
Catholic	-0.180	-2.32	-0.225	-2.70	-0.060	-0.77	-0.075	-0.94
No religion	0.023	0.43	-0.029	-0.52	0.036	0.72	0.072	1.39
Sample size	4624		4650		4638		4644	

Table A3: Racial Attitude Probits

Variable	Marriage		Boss		Prejudice	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Unemployment rate	2.249	1.71	-0.256	-0.18	-0.680	-0.84
Ethnic minor. conc.	0.094	3.69	0.013	0.44	0.079	4.61
Income Rank	0.296	2.68	-0.021	-0.17	0.386	5.44
Manual worker	0.075	1.43	-0.035	-0.58	-0.091	-2.43
Ever unemployed	-0.007	-0.10	0.016	0.21	0.082	1.52
Ever long term unemp.	-0.006	-0.04	0.125	0.89	-0.081	-0.94
Female	0.060	1.21	-0.128	-2.24	-0.202	-5.99
Compulsory Education	0.109	1.88	0.152	2.31	0.051	1.23
High Education Level	-0.314	-3.44	-0.155	-1.36	-0.322	-5.36
Age/100	4.067	5.81	-1.783	-2.33	0.534	1.15
$Age^2/10000$	-2.848	-4.02	2.217	2.85	-0.564	-1.19
Catholic	-0.095	-1.21	-0.239	-2.29	-0.326	-5.50
No religion	-0.087	-1.53	0.049	0.80	0.001	0.02
Sample size	4143		4184		10049	

Table A4: Job Attitudes Probits

Variable	Job Loss		Find Job		Wage		Job Security	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Unemployment rate	0.127	0.11	15.056	4.06	2.810	3.03	-2.757	-0.69
Ethnic minor. conc.	-0.013	-0.56	-0.091	-1.78	-0.050	-2.47	0.024	0.43
Income Rank	-1.596	-15.22	-0.625	-2.89	-0.802	-8.67	-0.652	-2.47
Manual worker	0.004	0.07	0.172	1.52	0.258	5.04	0.239	1.89
Ever unemployed	0.021	0.30	0.166	1.03	0.001	0.01	1.054	6.66
Ever long term unemp.	0.041	0.29	0.202	0.75	0.105	1.15	0.572	2.68
Female	0.342	6.53	-0.143	-1.39	0.332	6.97	-0.076	-0.66
Compulsory Education	-0.045	-0.82	-0.075	-0.64	0.086	1.66	0.035	0.27
High Education Level	0.114	1.68	0.051	0.30	0.055	0.88	0.081	0.44
Age/100	-8.743	-9.00	3.494	1.79	2.015	2.66	1.878	0.65
$Age^2/10000$	12.325	10.82	-0.924	-0.43	-1.447	-1.57	-0.568	-0.16
Catholic	-0.043	-0.51	-0.065	-0.38	0.035	0.55	-0.071	-0.39
No religion	-0.071	-1.43	0.078	0.75	0.038	0.84	0.028	0.23
Sample size	9045		651		5566		589	

Table A5: Welfare Attitude Probits

Variable	Benefits		Need		More Spending	
	Coeff	t-ratio	Coeff	t-ratio	Coeff	t-ratio
Unemployment rate	-6.966	-7.29	-8.028	-5.99	-3.380	-2.43
Ethnic minor. conc.	0.014	0.76	0.055	2.08	-0.020	-0.77
Income Rank	0.461	5.06	0.169	1.51	0.615	5.64
Manual worker	-0.147	-3.37	0.071	1.14	-0.133	-2.29
Ever unemployed	-0.212	-3.24	-0.059	-0.67	-0.016	-0.17
Ever long term unemp.	-0.188	-1.47	-0.132	-1.09	-0.087	-0.67
Female	0.054	1.16	0.069	1.28	0.085	1.61
Compulsory Education	0.037	0.80	0.247	3.51	0.127	1.98
High Education Level	-0.416	-6.26	-0.387	-3.82	-0.133	-1.47
Age/100	-0.935	-1.84	0.483	0.59	-1.641	-2.01
$Age^2/10000$	2.052	4.00	0.652	0.76	1.141	1.37
Catholic	-0.237	-3.61	-0.087	-1.10	-0.306	-3.60
No religion	-0.148	-3.39	-0.050	-0.86	-0.120	-2.06
Sample size	10282		2740		2746	

Table A6: Correlation of Attitudes

Less West Indian	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Less Asian	0.98	1.00	.	.	.	.	.	.	.	.	.	.	.	.
Less Euro	0.83*	0.80*	1.00	.	.	.	.	.	.	.	.	.	.	.
Less Australian	0.82*	0.78*	0.89*	1.00	.	.	.	.	.	.	.	.	.	.
Marriage	0.39*	0.45*	0.11*	0.01	1.00	.	.	.	.	.	.	.	.	.
Boss	0.41*	0.47*	0.10*	0.00	0.67*	1.00	.	.	.	.	.	.	.	.
Prejudice	0.46*	0.53*	0.17*	0.06	0.59*	0.64*	1.00	.	.	.	.	.	.	.
Job Loss	0.01	-0.02	0.01	0.03	-0.01	-0.03	-0.00	1.00	.	.	.	.	.	.
Find Job	0.06	0.09	0.09	0.04	-0.00	0.08	0.01	0.16*	1.00	.	.	.	.	.
Wage	0.01	-0.00	0.00	-0.01	-0.01	-0.04	-0.01	0.06	0.05	1.00	.	.	.	.
Job Security	0.14	0.15*	0.10	0.11	0.01	0.04	0.02	0.43*	0.25*	0.13	1.00	.	.	.
Benefits	0.18*	0.22*	0.08*	0.04	0.13*	0.15*	0.15*	-0.06	-0.21*	-0.01	-0.20*	1.00	.	.
Need	0.23*	0.27*	0.12*	0.04	0.16*	0.22*	0.22*	-0.12*	-0.14*	-0.03	-0.12*	0.52*	1.00	.
More spending	0.14*	0.19*	0.07	0.01	0.15*	0.13*	0.20*	-0.01	-0.06	-0.08	-0.05	0.37*	0.34*	1.00

Eigenvalues: 0.011 0.066 0.125 0.299 0.402 0.447 0.579 0.669 0.855 0.994 1.267 1.776 2.253 4.256

9 Appendix B: Wording of the Questions

Response	West Indians	Indians and Pakistanis	Common Market Countries (Europe)	Australians and New Zealanders
more settlement, about the same	34.79	31.06	55.29	68.01
less settlement	65.21	68.94	44.71	31.99
	100.00	100.00	100.00	100.00

Table B1: Immigration Questions

Wording of Question: Britain controls the number of people from abroad that are allowed to settle in this country. Please say for each of the groups below whether you think Britain should allow more settlement, less settlement, or about the same as now.

Table B 2: Racial Acceptability Questions

Response	Opposition to Marriage	Opposition to Boss
Not mind	48.09	81.11
Mind	51.91	18.89
	100.00	100.00

Wording of Question: Do you think most people in Britain would mind (or not mind) if one of their close relatives were to marry a person of Asian / West Indian origin? ... and you personally? Would you mind or not mind? Do you think most people in Britain would mind (or not mind) if a suitably qualified person of Asian / West Indian origin were appointed as their boss? ... and you personally? Would you mind or not mind?

Table B 3: Racial Prejudice

Response	
Not prejudiced at all	63.73
Very or a little prejudiced	36.27
	100.00

Wording of Question: How would you describe yourself? As very prejudiced against people of other races, a little prejudiced, or not prejudiced at all?

Table B 4: Fear of Job Loss	
unlikely	94.29
likely	5.71
	100.00

Wording of Question: If employed: Thinking now about your own job, how likely (or unlikely) is it that you will leave this employer over the next year for any reason? ... Why do you think you will leave?

People recorded as likely are those who answered *very likely* or *quite likely* to the first question and gave as reason *firm will close down*, *I will be declared redundant*, or *my contract of employment will expire*.

Table B 5: Ease of Finding Job	
very easy	6.90
fairly easy	29.04
neither	16.07
fairly difficult	27.60
very difficult	20.39
	100.00

Wording of Question: If in paid job for 10 or more hours a week: If you lost your job for any reason, and were looking actively for another one, how easy, or difficult, do you think it would be for you to find an acceptable job? If in paid job for less than 10 hours a week or no paid job: If you were looking actively, how easy, or difficult, do you think it would be for you to find an acceptable job?

Table B 6: Wage Expectations	
rise by more than cost of living	16.86
rise by same as cost of living	48.15
rise by less than cost of living	26.60
not rise at all	8.39
	100.00

Wording of Question: If employee: If you stay in this job, would you expect your wages or salary over the coming year to ...

Table B 7: Job Security

strongly agree	18.37
agree	42.18
neither	18.66
disagree	16.13
strongly disagree	4.66
	100.00

Wording of Question: If in paid work for 10 or more hours a week, please tick one box to show how much you agree or disagree that [this statement] applies to your job: My job is secure.

Table B 8: Level of Benefits

too low or neither	65.97
too high	34.03
	100.00

Wording of Question: Opinions differ about the level of benefits for the unemployed. Which of these ... statements comes closest to your own: *Benefits for the unemployed are too low and cause hardship* or *Benefits for the unemployed are too high and discourage people from finding jobs.*
In later years, people are allowed to agree to both - in all years we categorise according to whether people accept only the second statement.

Table B 9: Attitudes to Welfare

Responses	Need	More spending
strongly agree	9.93	16.76
agree	35.52	42.93
neither	25.95	23.00
disagree	22.67	15.58
strongly disagree	5.93	1.73
	100.00	100.00

Wording of Question: Please tick one box for each statement below to show how much you agree or disagree with it.
Many people who get social security do not really deserve any help.
The government should spend more money on welfare benefits for the poor, even if it leads to higher taxes.
We reverse the answers to the first statement.