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# Explaining trends in UK immigration

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**Abstract** Since the 1970s Britain has gone from being a country of net emigration to one of net immigration, with a trend increase in immigration of more than 100,000 per year. This paper represents the first attempt to model the variations in net migration for British and for foreign citizens, across countries and over time. A simple economic model, which includes the selection effects of differing income distributions at home and abroad, largely accounts for the variations in the data. The results suggest that although improved economic performance in the UK relative to overseas has tended to increase immigration, rising UK inequality has had an even larger effect. Immigration policies at home and abroad have also increased net immigration, particularly in the 1990s.

**Keywords** Immigration · Emigration · Immigration policy

**JEL Classification** F22 · J61 · J78

## 1 Introduction

In the last 20 years the UK has become a country of net immigration. During the 1960s and 1970s, emigration exceeded immigration so that net immigration was persistently negative. Since then net immigration has progressively increased. The best available measure of long-term trends indicates an increase in the annual net immigration from –24 thousand in the early 1970s to 89 thousand in the late 1990s—a total increase of 113 thousand. Recent trends are even more dramatic. From the trough in 1991–1993 to the peak of 1998–2000, net immigration surged by more than 100 thousand per annum.

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So why has UK net immigration increased so dramatically? On one view it is simply the result of immigration policies at home and abroad and is therefore chosen by policymakers. But evidence for other countries shows that a good deal of the variation in immigration can be explained by economic forces.<sup>1</sup> This issue is particularly important since the government has recently undertaken a series of reforms to immigration policy, the most recent of which is the Nationality, Immigration and Asylum Act of 2002. Yet these policies have been implemented in the absence of any quantitative research on the determinants of immigration to the UK.<sup>2</sup> As a result it is not possible to assess the effects of policy as distinct from economic forces on the size and composition of the net and gross flows.

This paper is the first attempt to provide a set of econometric estimates to explain migration flows between Britain and the relevant source or destination countries.<sup>3</sup> The flows are explained in part by the usual economic variables such as business cycles and per capita incomes at home and abroad. A key finding is that changing income distribution also matters and that growing inequality in Britain accounts for a significant share of the recent rise in net immigration. Shifts in policy must also be taken into account, and these seem to have been important, particularly in the late 1990s.

The following section outlines the trends and composition of migration to and from Britain. This is followed by a summary of immigration policies at home and abroad and then by a discussion of incentives and selectivity in the decision to migrate. This highlights the effects of relative income, of earnings inequality and of policy in determining the flows of migrants. The subsequent sections report random effects panel estimates, on data on net and gross immigration from the International Passenger Survey (IPS). The data covers 13 source/destination areas over 25 years and is analysed for British citizens and for foreign citizens. The results support the view that relative income, inequality and policy all play a part in determining these flows.

Finally, an attempt is made to decompose the influences that account for trends in total net immigration, both in the long run and in the short run. This indicates that trends in unemployment and relative income have contributed only modestly to the increase in net immigration. More important are the effects of the long-term increase in UK inequality and the shifts in European and British policy during the 1990s. The paper concludes with some speculations about prospective future trends in UK immigration.

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<sup>1</sup> Studies for individual countries include Cobb-Clark and Connolly (1997) for Australia, Clark et al. (2002) for the United States, Karemera et al. (2000) for the United States and Canada and Karras and Chiswick (1999) for Germany. Other studies are summarised by Bauer and Zimmermann (1999). Recent papers by Mayda (2003) and Pedersen et al. (2004) provide estimates from panel data for a range of major immigration countries.

<sup>2</sup> A survey of UK immigration by Glover et al. (2001) published by the Home Office contains some assessment of the factors behind recent trends in immigration as background to the 2002 Act and the government White Paper that preceded it. However, it does not cite any quantitative studies, and it only provides evidence of a negative relationship between net immigration and UK unemployment since 1984. Hatton and Wheatley Price (2005) provide a survey of the literature on longer term trends in UK international migration and immigration policy.

<sup>3</sup> One exception is Mitchell and Pain (2003) which appeared after this paper was written.

## 2 Trends in international migration

The only comprehensive statistics on international migration for Britain come from the IPS, which has been taken in its present form since 1964. It is derived from a sample of travellers to and from the UK surveyed at airports, seaports and the channel tunnel (see [Appendix](#) for further details). Migrants are defined in the IPS as those who are entering (or leaving) for an intended period of at least a year, after at least a year abroad (or in Britain). Trends in the IPS net immigration figures can be seen in [Fig. 1](#). The long-term increase in net immigration displays short run fluctuations around a clear upward trend. From the early 1980s the historic pattern of net emigration turns into net immigration, increasing sharply from the mid-1990s. The Office for National Statistics adjusts the overall immigration balance to take account of certain omitted categories. Adjusted net immigration (the dotted line) exceeds the IPS figure by about 40 thousand per year between 1985 and 2000, but the trends and fluctuations are similar in both series.<sup>4</sup>

[Figure 2](#) shows (unadjusted) net immigration divided between British citizens and foreign citizens. Most of the increase in net immigration before the 1980s was due to the declining net emigration of British citizens. Since then the trend has been relatively flat. By contrast, net immigration of foreign citizens drifted downwards very mildly until the early 1990s, after which there was a sharp increase. The IPS data also divides the flows of migrants by country, or region, of next or last residence.<sup>5</sup> [Table 1](#) shows the direction of net immigration over recent decades for British and foreign citizens combined. The decline in net emigration to ‘Old Commonwealth’ countries reflects, in part, the long-term decline in emigration of British citizens shown in [Fig. 2](#). For Australia and Canada, net emigration since the 1970s has decreased dramatically, whereas for New Zealand and South Africa it has become net immigration.

It is notable that there has been no upward trend in net immigration from the New Commonwealth, either from the Indian subcontinent, from Africa, or from the Caribbean. Among non-Commonwealth countries there has been a strong upward trend in net immigration from Europe, particularly the European Union. But there is little evidence of increases in net immigration from elsewhere. Overall, the rise in net immigration has come from the relatively developed Organisation for Economic Cooperation and Development (OECD) countries, rather than from the third world. Roughly the same applies to the surge from 1993 to 1998—85% of which is accounted for by the Old Commonwealth, Europe and the United States.

Net immigration represents the difference between much larger gross flows in both directions. As [Table 2](#) shows, in the 1990s the net immigration balance was about one fifth of gross immigration, and in the 1970s net emigration was less than a fifth of gross emigration. The overall change in the balance was driven partly by a decline in gross emigration of British citizens and, more notably, by a rise in gross immigration of foreign citizens. The substantial gross immigration of British citizens, and gross emigration of foreign citizens, reflect the fact that many migrants

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<sup>4</sup> Adjusted figures are available only since the mid-1980s, and they are available at a disaggregated level only from 1999. For the analysis that follows there is no alternative but to use the unadjusted figures to maintain comparability over time and across different source/destination regions (see [Appendix](#)).

<sup>5</sup> These categories are not ideal, but they are the lowest level of aggregation available in the published statistics.

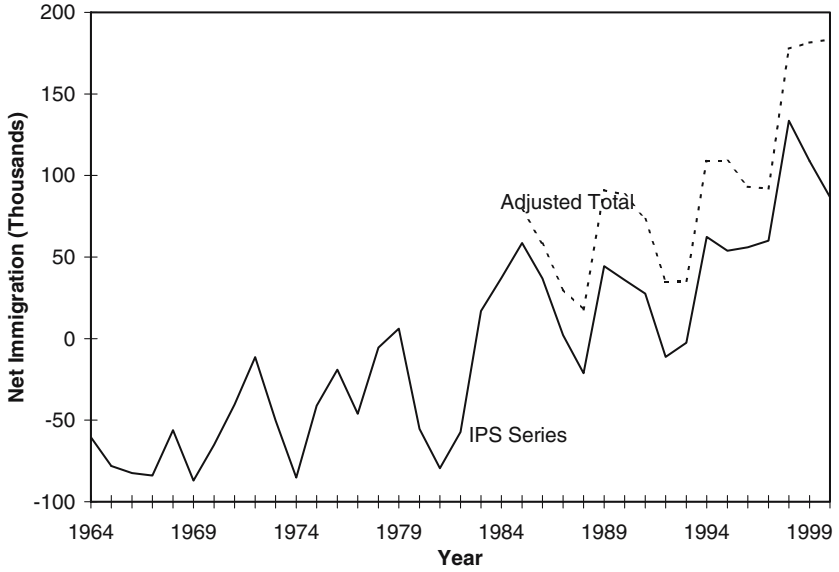


Fig. 1 Total net immigration, 1964–2000 (International Passenger Survey and adjusted total)

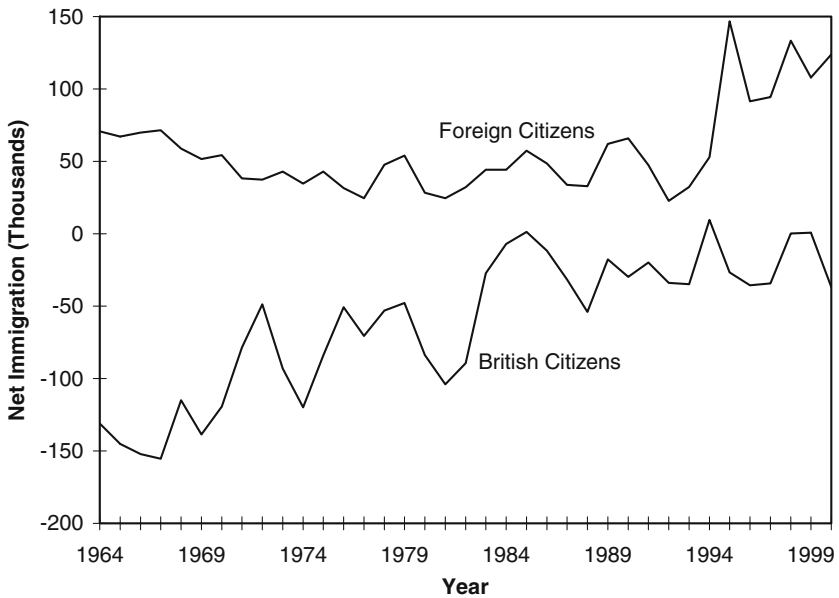


Fig. 2 Net Immigration of British and Foreign citizens, 1964–2000 (International Passenger Survey)

**Table 1** UK net immigration by country of origin or destination (IPS, thousands per decade)

	1971–1980	1981–1990	1991–2000
<b>Commonwealth</b>			
Australia	-189.8	-181.2	-43.4
Canada	-148.3	-47.7	-7.5
New Zealand	-61.0	20.0	13.5
South Africa	-67.3	-3.3	78.6
Other African Commonwealth	81.4	54.3	72.1
Bangladesh, India, Sri Lanka	108.4	109.5	106.5
Pakistan	67.8 <sup>a</sup>	77.9	62.5
Caribbean Commonwealth	-0.2 <sup>b</sup>	3.0	3.9
Other Commonwealth	57.8	9.6	48.5
<b>Foreign</b>			
European Union	-70.2 <sup>c</sup>	63.2 <sup>d</sup>	127.2 <sup>e</sup>
Rest of Europe	-21.7	3.1	26.5
United States	-45.0	-62.8	-19.9
Rest of America	1.1	1.5	-2.5
Other foreign	-62.5 <sup>f</sup>	27.1	108.1

Source, Office for National Statistics, *International Migration* (various issues)

<sup>a</sup> From 1973 only

<sup>b</sup> West Indies only

<sup>c</sup> Coverage reflects enlargement in 1973

<sup>d</sup> Reflects enlargement in 1981 and 1986

<sup>e</sup> As constituted in 1995

<sup>f</sup> Includes Pakistan 1968–1972

are relatively short-term stayers. In the decade 1991–2000, 36% of immigrants and 28% of emigrants were intending to stay for less than 3 years, whereas 39% of immigrants and 54% of emigrants intended to stay for more than 4 years (Table 3).

The IPS records the age, sex and economic status of immigrants and emigrants. Table 4 shows the net balance of these various categories over recent decades. Net

**Table 2** Gross and net immigration flows (IPS, thousands per decade)

	1971–1980	1981–1990	1991–2000
<b>All nationalities</b>			
Gross immigration	1,907.7	2,185.4	2,798.3
Gross emigration	2,255.5	2,111.1	2,223.2
Net immigration	-347.8	74.3	575.1
<b>UK citizens</b>			
Gross immigration	828.1	975.9	1,046.0
Gross emigration	1,558.3	1,346.8	1,257.6
Net immigration	-730.2	-370.9	-211.6
<b>Foreign citizens</b>			
Gross immigration	1,079.6	1,209.5	1,752.3
Gross emigration	697.2	764.3	965.6
Net immigration	382.4	445.2	786.7

Source, Office for National Statistics, *International Migration* (various issues)

**Table 3** Intended length of stay among immigrants and emigrants, 1991–2000 (IPS, percent of total)

	1–2 years	3–4 years	More than 4 years	Not sure
Immigrants	35.6	18.3	39.4	6.7
Emigrants	27.6	11.9	54.4	6.0

Source, Office for National Statistics, *International Migration* (various issues)

**Table 4** Net immigration by sex, age and occupational status (IPS, thousands per decade)

	1971–80	1981–90	1991–2000
Sex			
Male	–216.1	–20.5	238.3
Female	–132.1	94.7	337.0
Age			
<15	–82.0	27.8	58.1
15–24	65.7	148.7	399.6
25–44	–282.7	–53.5	121.1
>44	–49.3	–48.7	–3.3
Occupation (adults)			
Professional/managerial	–112.5	2.9	156.1
Manual/clerical	–274.0	–89.2	75.0
Students	148.1	+61.0	193.8
Other adults (unoccupied)	–30.0	+54.6	100.7

Source, Office for National Statistics, *International Migration* (various issues)

Other adults are chiefly those labelled as ‘housewives’

immigration of females tends to exceed that of males, and the overall growth in net immigration is largely due to an increase in the 15–24 age range and fall in net emigration among those aged 25–44. The non-worker categories, including those under 15, represented 47% of the gross inflow and 43% of the gross outflow in the decade 1991–2000. A large proportion arrived (and departed) as part of the family of a worker. Although many of the recorded migrants are not workers, it seems likely that these flows will nevertheless be sensitive to economic conditions.<sup>6</sup>

In addition, a growing number have come to the UK for education. The persistent net inward flow of students probably reflects the fact that some of those who returned would have given their future or intended occupations rather than describing themselves as students. No doubt some of those who arrived as students would have joined the UK labour force on completion of their studies. During the 1990s there was a sharp increase in the net inflow, from 13.8 thousand in 1993–1995 to 37.7 thousand in 1996–1998. This may reflect the expansion of student places in higher education institutions. However, the correlation coefficient between the net inflow of foreign citizens who were students and those who were

<sup>6</sup> Although it might be desirable to analyse them separately, the migrant flows that are used in the econometric estimates include these non-worker categories because it is not possible to disaggregate by status and by source or destination from the published figures.

non-students since 1982 is 0.7. Thus the net student inflow moves fairly closely with that of other migrant types and evidently responds to similar forces.

The IPS records the occupations of immigrants and emigrants, but these are presented only in two broad categories: professional or managerial or manual or clerical. Over the last three decades, net immigration turned into net immigration in both categories, and in the 1990s the net immigration of ‘skilled’ workers was more than double the net flow of ‘unskilled’ (Table 4). But changes in the net balance hide the fact that both immigration and emigration have become more skilled. As Fig. 3 shows, the percentage of professional and managerial among worker immigrants rose from 40% in 1971 to 72% in 2000, and their share among emigrants (the dotted line) rose by a similar amount. This change in the skill structure is an important characteristic of the overall trend in migration. It seems likely that this was due to three things. First, there is the general rise in skills among the workforce at home and abroad. Second, there has been increasing skill selectivity of immigration policies in countries receiving British immigrants, which have reduced the opportunities for unskilled British workers to emigrate. And third, mildly skill-selective policies in Britain have been combined with increasing incentives for skilled immigrants, as reflected in the widening income distribution.

### 3 Immigration policies at home and abroad

British immigration policy is governed by the Immigration Act of 1971 and subsequent modifications to it. Immigration control is administered by the Home

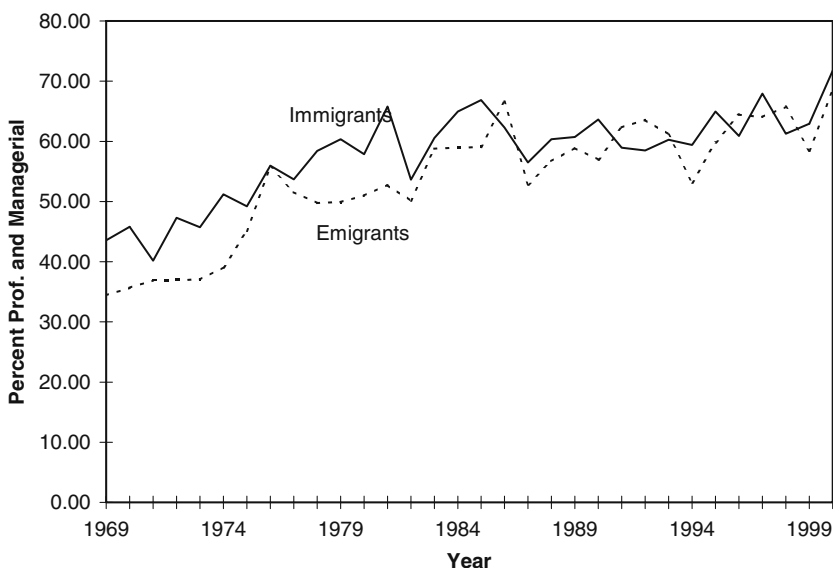


Fig. 3 Skill composition of immigrants and emigrants, 1969–2000 (of those with occupations; International Passenger Survey)

Office Immigration and Nationality Department, which includes the issue of work permits.<sup>7</sup> Irish citizens and nationals of European Economic Area countries are essentially free to live and work in Britain. Commonwealth citizens with right of abode, those who have British passports, and those who have acquired finite or indefinite leave to enter or remain also have the right of free entry.<sup>8</sup> Those not otherwise entitled to work in Britain are required to have a work permit, applied for by a prospective employer. The number of work permits is not subject to an overall quota but permits are issued according to the level of qualification or for specific occupations in demand. Work permits are granted initially for 4 years but with the possibility of renewal for a fixed term or the granting of indefinite right to remain. The right to work is also available on a short-term basis to groups such as business people, journalists, diplomats, sports people and entertainers. Short-term work permits are also issued under a variety of schemes for working holiday-makers, agricultural workers, au pairs, teachers and those entering under the Training and Work Experience Scheme.

The work permit system has been subject to minor modifications since the 1970s, with major revisions in 2000 and 2002.<sup>9</sup> The number of work permits issued fell from 75 thousand in 1969 to a low of 15 thousand in 1982, rising again to 80 thousand in 1999. The sharp rise in the number of work permits issued in the late 1990s is indicative of a significant relaxation of policy adopted by the labour administration from 1997 onwards, including an increased allocation of work permits and relaxation of controls on non-economic immigration. Under the 2002 Act, the government introduced a further expansion of immigration routes including new programme to attract highly skilled immigrants, based on a points system.

Migrants under the work permit system may obtain indefinite leave to remain or be accepted for settlement and may eventually qualify for UK citizenship. Spouses and children of primary immigrants can also acquire the right to settle and work in Britain, subject to certain criteria. In some circumstances, the right to family reunification is extended to parents and grandparents and to fiancé(e)s. In 1998, 20 thousand entered as dependants of work-permit holders and another 50 thousand under the family reunification scheme.

The other main groups of migrants to the UK are students and refugees. Students (not otherwise qualified for entry) are admitted if accepted for a course at a recognised educational institution, but without the right to work and only for the duration of the course. Britain's policy towards asylum seekers (not directly considered here) is based on its obligation under the 1951 Refugee Convention and its 1967 Protocol. About one third of asylum claims are accepted, either as Convention refugees or under the discretionary category of 'exceptional leave to remain'.

Among the main destination countries for British emigrants there have been significant shifts in immigration policy since the 1960s. These include the abolition of preferences for migrants from Britain and Europe, variations in total immigrant

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<sup>7</sup> These are currently issued by Work Permits UK, a part of the Home Office, but for most of the period under review, they were issued by the Overseas Labour Service of the Department of Education and Employment.

<sup>8</sup> Current regulations can be found at <http://www.ind.homeoffice.gov.uk/>.

<sup>9</sup> On the system up to the late 1980s, see Salt and Kitching (1990); arrangements until the most recent changes are summarised in Glover et al. (2001).



quotas and the increasing use of selection by labour market characteristics, especially education and skills.<sup>10</sup>

In Canada the preference given to immigrants from the UK, France, the US and certain Commonwealth countries was abolished in 1962 and replaced with a system based on four different categories: sponsored dependants, nominated relatives, refugees and asylum seekers and independent migrants. The admission of assisted relatives and independent migrants is based on selection through the points system first established in 1967. In addition to having relatives in Canada, points are awarded for age, education, occupation, having pre-arranged employment and fluency in English or French. This basic system was modified by the Immigration Acts of 1976, 1988 and 1993. Administratively set targets for total admissions were sharply reduced in 1982–1986 and then raised to over 200 thousand in the 1990s. As a result, the share admitted under the points system was reduced in the 1980s, but increased again in the 1990s (Green and Green 1995, 1999). Modifications to the points system further increased the skill selectivity of immigration policy in the 1990s, and by 1994 nearly half of all immigrants were admitted principally on labour market characteristics.

From 1973, Australia abandoned the so-called ‘white Australia’ policy, which gave preference chiefly to immigrants from Britain and Ireland, in favour of a non-discriminatory system similar to that of Canada. The targets for admission were also reduced during the 1970s and expanded subsequently, but have varied from year to year depending on labour market conditions. The points system adopted originally in 1979 and radically revised in 1983 is applied to independent migrants, business migrants, those nominated by employers and those sponsored by relatives. The criteria put weight on occupations in demand, education and experience. Over time, skill selectivity has increased, and in the 1990s more than a third of migrants were selected on economic criteria.

In New Zealand, similar policies have been followed since the weakening in 1974, and abolition in 1987, of preferences for British and European immigrants. The points system adopted in 1991 stresses qualifications, age, experience, language skills and sponsored relatives. But, as compared with Australia, the New Zealand system has gone further in giving weight to general skills rather than to occupations in demand (Winkelmann 2001). In the 1990s, 65% of immigrants to New Zealand were points tested. Both Australia and New Zealand operate a variable point score for admission that depends on labour market conditions.

In the United States the 1965 Amendments to the Immigration and Nationality Act abandoned country quotas favouring western Europe, replacing this with an aggregate quota for the eastern hemisphere as a whole. Under the post-1965 system, the overwhelming majority of visas were reserved for family reunification migrants, including non-immediate relatives. The 1990 Immigration Act expanded the number of employment-based visas from 54,000 to 140,000, nearly all of which were designated for skilled workers, and the total quota was increased by about 40%. But US immigration policy remains less skill-selective than that of the other traditional countries of immigration. Under the system in operation since 1992, more than 70% of visas are still reserved for family members.

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<sup>10</sup> Summaries of immigration policies in the major receiving countries can be found in Stalker (1994), UN (1998) and OECD (1998). On international migration law, see Plender (1987).

Like Britain, most of the countries that receive migrants from Britain operate programmes for temporary immigration, often for the high-skilled or for occupations in demand. In Australia, employer-nominated skilled workers are admitted for 2 years (renewable once), and in Canada, for 3 years (renewable). In the United States the provision for admitting high-skilled workers with H-1B visas for periods of up to 3 years (renewable once) was expanded under the 1990 Immigration Act. In all three countries and New Zealand, fixed-period visas are also issued under various schemes for study and work experience, for working holidays and for business personnel or those moving within the same firm.

Among other countries, immigration policies vary too widely to discuss in detail. Most countries operate a system of work permits or passes, generally for restricted periods of time, and sometimes subject to quotas. Often, immigrants require sponsorship from an employer or a family member, and the right to remain or to become a citizen is strictly circumscribed. In some cases, rules for immigrants differ by source country or ethnicity. In some countries, such as Japan, and in other parts of Asia, immigration controls are relatively tight, whereas in other cases such as in South America they are less restrictive.

#### 4 Migration and selection

The effects of economic incentives on migration have been studied, notably by Sjaastad (1962), Borjas (1987) and Chiswick (2000). The basic framework laid out by Borjas has been widely used to analyse the average ‘quality’ of the immigrant flow, but it has less often been applied to the quantity of immigration or emigration. Here, I use a variant of this framework to examine the effects of relative incomes, income inequality and immigration policy on the numbers of migrants or, more specifically, on the probability that individuals will migrate from one country to another.

In the source country,  $y$ , skill endowments follow a normal distribution:  $s \sim N(\mu_s, \sigma_s^2)$ . The incomes that individual  $i$  ( $i=1, \dots, n$ ) receives at home in country  $y$ , and would receive if he/she were to migrate to country  $x$ , are:

$$\text{Income in destination : } w_{xi} = \alpha_x + \beta_x s_i, \text{ distributed as } w_x \sim N(\mu_x, \sigma_x^2).$$

$$\text{Income in origin : } w_{yi} = \alpha_y + \beta_y s_i; \text{ distributed as } w_y \sim N(\mu_y, \sigma_y^2). \quad (1)$$

Where  $\alpha_x, \beta_x, \alpha_y$  and  $\beta_y$  are parameters of the respective earnings functions. The greater is  $\beta$  the greater the return on skills and the more unequal is the country’s income distribution. Thus income levels, and income inequality, differ in origin and destination, but incomes in  $x$  are perfectly correlated with those in  $y$  across individuals in the origin country.

The costs of migration (including psychic costs) include three elements. Individual preferences for migration, in terms of equivalent income,  $z_i$ , follow a normal distribution,  $z \sim N(\mu_z, \sigma_z^2)$ , where  $z$  is independent of  $s$  [ $\text{Cov}(s, z)=0$ ].  $z_i$  is interpreted as an individual-specific cost or compensating differential, hence  $\mu_z$  is assumed to be positive. This ensures that not everyone migrates in response to an income differential favouring the destination country. Factors such as having relatives in the destination country could be interpreted as lowering the costs of

emigration by reducing the value of  $z_i$ . There is also a direct cost,  $c$ , which is the same for all migrants. The third element, also reflected in  $c$ , is immigration policy: tougher immigration policy raises the cost of migration directly as well as indirectly through the cost of acquiring characteristics necessary to gain admission.

The probability that an individual,  $i$ , will migrate from country  $y$  to  $x$ ,  $m_i$ , is

$$m_i = \text{Prob}(w_{xi} - w_{yi} - z_i - c > 0), \text{ or} \tag{2}$$

$$m_i = \text{Prob}(v > 0), \text{ where } v = w_{xi} - w_{yi} - z_i - c$$

Summing over all  $n$  individuals in source country  $y$ , the emigration rate to  $x$  is

$$M = 1 - \Phi\left(\frac{-\mu_x + \mu_y + \mu_z + c}{\sigma_v}\right) \tag{3}$$

where  $\Phi$  is the standard normal distribution function. Higher mean income in the destination or lower income in the source country increases the migration rate, as does a fall in the mean of personal migration costs such as might be associated with a larger expatriate community.

The standard deviation of  $v$  can be written as

$$\sigma_v = \sqrt{\sigma_x^2 + \sigma_y^2 + \sigma_z^2 - 2\sigma_x\sigma_y} \tag{4}$$

The effects of changes in income distribution depend on the sign of the numerator in the bracketed term in Eq. (3), as well as on the sign of the derivative of  $\sigma_v$  with respect to  $\sigma_x$  and  $\sigma_y$ . If the destination country has sufficiently high relative income adjusted for migration costs ( $\mu_x > \mu_y + \mu_z + c$ ), and it is more equal ( $\sigma_x < \sigma_y$ ), then an increase in destination inequality will increase immigration. Thus increasing inequality in Britain would tend to attract (relatively skilled) migrants from countries that were sufficiently poor and relatively equal. By contrast, if income in Britain (adjusted for immigration costs) is sufficiently low relative to, say, OECD countries, then increasing inequality will increase migration from these provided that British inequality is greater. If neither of these cases holds, then growing inequality will deter immigration. The effects for origin countries are exactly the opposite. Thus increasing inequality in poor and unequal origin countries will tend to stem emigration if they are sufficiently unequal initially.

## 5 Data

The data on migration to and from Britain is from the International Passenger Survey, for which summary statistics were presented earlier. The survey covers about 0.2% of all travellers, only a fraction of whom are migrants. Although the data is subject to sampling error, non-response rates are relatively low (see [Appendix](#) for further details).<sup>11</sup> Biases are most likely to arise because stated intentions may differ from actual behaviour (as in the case of asylum seekers or

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<sup>11</sup> Because immigration is the left-hand side variable, the sampling errors will not bias the estimates provided that they are not correlated with the explanatory variables.

visitor switchers) or because plans change. The survey results, grossed up using a complex weighting system, are published only for the source destination countries listed in Table 1. Thus it is not possible to further disaggregate the country groups. Because of changes in the countries included in country groups, EU and non-EU Europe were merged.<sup>12</sup> This gives 13 country or country groups over the period from 1976 to 2000 a total of 325 country-year observations. These are for all migrants, and although they can be divided between British and foreign citizens, they cannot be disaggregated by age or labour market status.

Series for real income per capita were obtained from the World Bank Global Development Network database.<sup>13</sup> These are an updated version of the Penn World Table 5, and they are adjusted to purchasing power parities of 1985. Income for the country groups represented in the IPS statistics were obtained by taking weighted averages using (variable) population weights. Excluding the single countries and the aggregate of Bangladesh/India/Sri Lanka, the remaining six country groups are represented by 107 individual countries. However, China, the former Soviet Union, the former Yugoslavia and Ireland are excluded. A consistent annual series for the gini coefficient of equivalised household, post-tax incomes in the UK was provided by the Institute of Fiscal Studies.<sup>14</sup> Foreign income inequality was calculated from World Bank data, assembled by Deininger and Squire (1996) and augmented by the WIDER Institute.<sup>15</sup> The series used are those designated as 'high quality' and are linearly interpolated between benchmark years as appropriate. The six multiple country groups represent a total of 82 countries, and they are each aggregated using current population.

To capture the effects of expatriate communities in Britain, we use the stock of foreign-born living in Britain in 1981 for each of the source countries or aggregates.<sup>16</sup> For the British living abroad, we have similar figures for 1971, but only for the USA, Australia, Canada, New Zealand and South Africa. For the other country groups, where the numbers of British-born are likely to be small, the value was set to zero.

Unemployment rates, which often feature in migration models, could only be obtained on a consistent basis for OECD countries. Because these overseas unemployment rates did not turn out to be empirically important, only the UK unemployment rate is used. Other variables including relative education levels and UK real house prices also proved to have little effect in the regressions, and so these are omitted in the results presented below.

<sup>12</sup> The Middle East is separately distinguished but only from the 1980s, and so this is subsumed in other foreign.

<sup>13</sup> Income and population data were obtained from <http://www.worldbank.org/research/growth/GDNdata.htm>.

<sup>14</sup> I am grateful to Andrew Shephard who kindly made this series available to me. Further details and an analysis of trends in income equality (for 1979–1997) are given in Clark and Taylor (1999). Steve Machin kindly provided an alternative series for UK wage inequality. This series gives similar results to those using income inequality, and so only the latter are reported in the following sections.

<sup>15</sup> These data are available at <http://www.wider.unu.edu/wiid/wiid.htm>. Certain adjustments were made according to whether the observations were for income/expenditure, gross/net income or individuals/households.

<sup>16</sup> These data are reported in ONS International Migration, 1983.

**Table 5** Immigration of foreign citizens, random effects panel estimates, 1976–2000

	Net	Gross
Constant	-1.83 (0.7)	-0.53 (0.1)
Change in UK unemployment rate	-0.41 (2.4)	-0.37 (2.0)
Log GDP per capita ratio (UK to foreign, $t-1$ )	4.07 (2.5)	2.48 (1.3)
Gini coefficient ratio (UK to foreign, $t-1$ )	2.44 (0.9)	8.03 (2.7)
Log GDP per capita ratio ( $t-1$ ) $\times$ Gini coefficient ratio ( $t-1$ )	-3.71 (2.0)	-5.85 (3.0)
Foreign-born population in UK, 1981	9.68 (2.1)	24.68 (2.4)
Europe 1987–2000	3.23 (1.9)	14.94 (2.4)
Europe 1996–2000	18.83 (8.8)	29.73 (13.6)
Dummy 1998–2000	4.54 (6.2)	5.62 (7.4)
$R^2$ Within	0.38	0.65
Between	0.58	0.69
Overall	0.46	0.68
Breusch–Pagan $\chi^2_{(1)}$	199.41	1,464.19
Hausman $\chi^2_{(9)}$	3.61	0.44
No. of observations	325	325

'z' statistics in parentheses

## 6 Immigration of foreign citizens

Random effects panel estimates of immigration for the 13 source areas by 25 years appear in Table 5. Random effects exploits the cross-sectional variation in the data, as well as the time series variation, and these estimates are not rejected against the alternative of fixed effects. The variable for the foreign-born stock in 1981 has no time series variation, and the European dummies are specific to flows to and from Europe. Overall these estimates explain 46% of the variation for net immigration and two thirds of the variation for gross immigration. In light of the relatively high gross flows, the emphasis here is chiefly on net immigration.

The UK unemployment rate is entered as a change (the current or lagged level was never significant), and it has a negative effect as expected. Thus a one-percentage point increase in unemployment over the previous year reduces net immigration of foreign citizens by about five thousand.<sup>17</sup> The log GDP ratio, the gini coefficient ratio and the interaction between the ratios of log GDP and the gini coefficient are entered with a one-period lag.<sup>18</sup> The interaction term is introduced to allow the effect of inequality to depend on the income level of overseas countries relative to the UK, as mentioned above. The effect of the coefficient on the log GDP ratio is positive as expected, and the coefficient implies that a 10% increase in the ratio of UK to foreign income per capita increases immigration by 5.3 thousand. However, when the negative coefficient on the interaction term is taken into

<sup>17</sup> These and other effects are calculated by multiplying the coefficient by the number of country groups to obtain the effects on total immigration.

<sup>18</sup> One reason for using lagged variables is that there may be simultaneity between immigration and income distribution, see for example Lerman (1999) for the United States and Barrett et al. (2000) for Ireland. Although unemployment is not lagged, the evidence produced by Dustmann et al. (2003) suggests that, for the UK, immigration has almost no effect on unemployment.

account (evaluating at the mean of the gini coefficient ratio, 0.75) a 10% increase in relative income increases immigration by only 1.7 thousand.

The gini coefficient ratio gives a positive sign that is not significant, whereas the interaction term is negative and significant. Using the point estimates, the overall effect of an increase in UK relative inequality is small and negative. The negative interaction term means that the effect of UK relative inequality gets smaller the poorer is the source region. The coefficients therefore imply positive selection from relatively developed countries.<sup>19</sup> At the mean income ratio for the five developed regions, a 10% increase in UK relative inequality would raise immigration by 3.6 thousand, whereas for the eight less developed regions, it would reduce immigration by 4.4 thousand.<sup>20</sup> This is what would be expected if rich-source countries are relatively more equal than the UK, whereas poor source countries are relatively less equal than the UK. But although the correlation between log relative income and the gini coefficient ratio is negative, it is not strong: across the 13 country/group means the correlation coefficient is  $-0.15$ . This is because some of the relatively poor countries, for example, in Asia, are relatively equal, whereas others in Africa and South America are relatively unequal.

The migrant stock has a large and significant effect. The coefficient for net migration implies that every thousand of the immigrant stock generates a further 126 immigrants each year. Clearly, this is the combined effect of lower costs of immigration faced by those with friends and relatives living in the UK and family reunification policy. It is notable, however, that the effects are much larger for gross immigration, suggesting that the migrant stock generates higher flows in both directions.

The two dummies for Europe reflect the EU enlargements of 1986 and 1995, each with a 1-year lag. Whereas the former takes a small coefficient, the latter is surprisingly large, raising annual net immigration from Europe by nearly 19 thousand in 1996–2000. This may reflect an initial inward surge, since the increase in gross immigration from 1987 was largely offset by a reverse flow. Alternatively, it may reflect the sharp increase in the number of incoming students that was noted earlier. A large proportion of these were from the EU, reflecting the lower fees for EU students as compared with other foreign students. Finally, the dummy for 1998 to 2000 that represents the loosening of UK immigration policy has a strong positive effect. In these years, the effect was to raise net immigration by 59 thousand per annum.

These results may be compared with those of a recent study by Mitchell and Pain (2003), which also uses the IPS data to analyse the determinants of gross UK immigration by source region. Consistent with the results reported here, they find that relative income and the migrant stock are key explanatory variables.<sup>21</sup> But they

<sup>19</sup> Borjas (1993) argued that the introduction in Canada, from the 1960s, of policies that were more skill-selective than those in the United States led to a larger share of Canadian immigrants than of American immigrants coming from more developed regions. It seems that rising income inequality in Britain has gradually been producing a similar selection effect to that produced by policy in Canada.

<sup>20</sup> The developed regions are taken to be Europe, the United States, Australia, Canada and New Zealand.

<sup>21</sup> However, the magnitudes of the effects are different. They find that an increase of 1% in UK income relative to source countries increases immigration by about 2,500, whereas an increase of 1,000 in the immigrant stock raises the inflow by about 65. Thus the income effect is much larger, and the stock effect is somewhat smaller than in the estimates of Table 5.

also find effects for the share of the source population aged 15–29, the level of bilateral trade flows, and the ratio of UK to EU per capita income. A similar demographic variable did not prove to be important when included in the Table 5 regressions, and neither did a measure of relative income in third countries. Bilateral trade effects were not tried because they are likely to be correlated with cyclical variables such as unemployment. Relative income and migrant stock effects also feature strongly in recent multi-country studies of gross migration flows (Mayda 2003; Pedersen et al. 2004), but none of these investigates the selection effects of changing inequality or explicitly includes dummies for policy.<sup>22</sup>

## 7 Emigration of British citizens

Random effects panel estimates for British citizens for the 25 years and 13 destinations appear in Table 6. Given that the left-hand side variable is for net emigration, the signs of the variables are expected to be the opposite of those in Table 5. These estimates explain 41% of the variation in net emigration and more than half of the variation in gross emigration. As with the estimates for foreign citizens, random effects is not rejected against the alternative of fixed effects. And as before, we focus on the estimates for net rather than gross emigration.

The coefficient on the change in UK unemployment is positive as expected, and a one-percentage point increase in the unemployment rate over the previous year increases net emigration by 8.2 thousand. The coefficients on the relative income and inequality terms offer further support for the model outlined above, and they have the opposite signs to those for the immigration of foreign citizens in Table 5. The coefficient on the log GDP ratio is about the same magnitude as that for foreign citizens in Table 5. But when the interaction term is taken into account, the effect of an increase in UK relative income, although negative, is very small.

Relative inequality is much more powerful for British citizens than for foreign citizens. The gini coefficient ratio has an overall negative effect, which implies that a 10% rise in relative inequality reduces emigration by 18.2 thousand. The strong effect of inequality may be explained, at least in part, in terms of the framework set out above. If the migration cost facing prospective British emigrants (as represented by  $\mu_z + c$  in Eq. (3)) is sufficiently positive, then even high income destinations will look relatively unattractive. And if they are also relatively equal, then the effect of rising relative inequality at home will be negative for emigration. This would mean that the more skilled would be less likely to emigrate so that total emigration would fall and emigrants would be less positively selected. The coefficients do tend to support this interpretation. They imply that a 10% rise in UK relative inequality would reduce net emigration to the five developed regions by 20.9 thousand and to the eight other regions by 8.6 thousand.

As with immigrants, the stock of UK-born living abroad is important, although it has no time series variation. The coefficient implies that each thousand of the British-born living abroad generates net emigration of 107 British citizens per year

<sup>22</sup> Mitchell and Pain (2003) used as a measure of policy the (lagged) level of UK immigration relative to total immigration to France, Germany, Belgium and the Netherlands. They found that the coefficient was generally positive, as expected, but not significant.



**Table 6** Emigration of UK citizens, random effects panel estimates, 1976–2000

	Net	Gross
Constant	12.11 (4.1)	17.23 (5.2)
Change in UK unemployment rate	0.63 (2.9)	0.52 (2.7)
Log GDP per capita ratio (UK to foreign, $t-1$ )	-4.47 (2.1)	-3.56 (1.6)
Gini coefficient ratio (UK to foreign, $t-1$ )	-15.52 (4.3)	-9.25 (2.6)
Log GDP per capita ratio ( $t-1$ ) $\times$ Gini coefficient ratio ( $t-1$ )	5.63 (2.3)	1.36 (0.6)
UK-born population overseas, 1971	8.23 (2.5)	4.25 (0.9)
South Africa 1991–2000	-4.78 (2.5)	-4.09 (2.2)
Australia 1979–2000	13.59 (4.1)	9.16 (2.8)
Australia 1983–2000	-8.65 (3.2)	-4.53 (1.8)
Canada 1982–1986	-6.12 (2.5)	-5.14 (2.2)
USA 1992–2000	0.38 (0.2)	3.03 (1.6)
New Zealand 1991–2000	1.63 (0.8)	2.08 (1.2)
Europe 1987–2000	0.43 (0.2)	14.74 (7.2)
Europe 1996–2000	8.99 (3.4)	6.88 (2.8)
$R^2$ Within	0.21	0.28
Between	0.67	0.60
Overall	0.41	0.52
Breusch–Pagan $\chi^2_{(1)}$	67.36	821.28
Hausman $\chi^2_{(13)}$	9.02	1.40
No. of observations	325	325

'z' statistics in parentheses

—an effect similar in magnitude to that in Table 5 for the immigration of foreign citizens. Surprisingly though, the UK-born coefficient for gross emigration is smaller and not significant.

The dummies for country-specific policy changes give mixed results. Political change in South Africa has a strong negative effect. For Australia, the dummy for 1979–2000 intended to capture the effects of introducing the points system is positive. This probably reflects the increase in immigration targets in the later 1970s, after the sharp tightening in the mid-1970s. But the dummy for 1983 onwards, when points testing was significantly toughened, gives the expected negative coefficient. For Canada, the sharp cut in immigration targets for 1982–1986 is strongly reflected in the data, but a dummy representing further expansion from 1993 was highly insignificant. Similarly for the United States, the expansion of the quota from 1992 has no significant effect. But for New Zealand, the 1991 reforms had a weak positive effect, contrary to what might have been expected.

The dummies for Europe from 1987 and 1996 tell a similar story to that for foreign citizens. From 1987 there was a large effect on gross emigration but only a small and insignificant increase on net emigration. By contrast, from 1996 both net and the gross emigration increased sharply. It remains to be seen whether this increase in emigration to Europe will be sustained in the longer term.



## 8 Why has net immigration increased?

The results for British and foreign citizens show that the same influences have operated with opposite signs on foreign immigration and British emigration. To measure their impact on net immigration as a whole, Table 7 provides estimates for total net immigration. The country dummies for policy shifts in South Africa, the United States, New Zealand and Europe from 1987 that are insignificant in the first column are excluded in the second column. The insignificance of the foreign-born population in the UK is somewhat surprising, and it largely reflects an inverse correlation with the UK-born population overseas. It is also notable that the overall effect of the dummy for Europe from 1996 to 2000 indicates that the net immigration of foreign citizens dominates the net out-migration of British citizens. This more parsimonious specification gives results that are broadly consistent with what would be expected from those for the two separate groups in Tables 5 and 6 above and do not require extensive comment.

The estimated coefficients in the second column in Table 7 are used to decompose the increase in aggregate immigration into the contributions of the different variables. Because the cross-sectional variation is highly influential in the random effects regression, it is important to see if these estimates can explain a major part of the variation over time in total net immigration. Two decompositions

**Table 7** Total net immigration (UK and foreign citizens), random effects panel estimates, 1976–2000

	Net	Net
Constant	-11.17 (3.6)	-11.63 (3.9)
Change in UK unemployment rate	-0.92 (3.1)	-0.94 (3.2)
Log GDP per capita ratio (UK to foreign, $t-1$ )	6.22 (2.7)	6.36 (2.8)
Gini coefficient ratio (UK to foreign, $t-1$ )	15.74 (3.6)	17.62 (4.6)
Log GDP per capita ratio $\times$ Gini coefficient ratio	-5.23 (1.9)	-5.74 (2.4)
UK-born population overseas, 1971	-9.91 (3.3)	-11.13 (4.6)
Foreign-born population in UK, 1981	1.65 (0.4)	-
South Africa 1991–2000	5.12 (2.1)	5.10 (2.2)
Australia 1979–2000	-12.69 (3.2)	-12.11 (3.1)
Australia 1978–2000	12.62 (3.5)	12.38 (3.4)
Canada 1982–1986	6.19 (1.9)	6.38 (2.0)
US 1992–2000	2.02 (0.8)	-
New Zealand 1991–2000	-1.49 (0.6)	-
Europe 1987–2000	2.95 (2.1)	-
Europe 1996–2000	11.55 (2.8)	12.04 (3.8)
Dummy 1998–2000	4.52 (3.7)	4.33 (3.6)
$R^2$ Within	0.29	0.28
Between	0.93	0.93
Overall	0.53	0.53
Breusch–Pagan $\chi^2_{(1)}$	0.08	0.17
Hausman $\chi^2_{(10,8)}$	16.96	13.69
No. of observations	325	325

'z' statistics in parentheses

**Table 8** Effects on total net immigration (thousands per annum)

	1976–1980 to 1996–2000	1986–1990 to 1996–2000
Change in UK unemployment rate	13.4	–6.1
Log GDP per capita ratio	2.6	0.6
Gini coefficient ratio	36.6	13.1
Europe dummy	12.0	12.0
Other country dummies	5.4	4.1
UK policy dummy	33.8	33.8
Explained total	103.8	57.5
Actual total	113.0	69.4

are presented in Table 8, based on applying the coefficients to the average values of the variables for five-year periods.<sup>23</sup> Over the long term, 1976–1980 to 1996–2000, the predictions account for more than 90% of the overall increase in net immigration of 113 thousand per annum. Similarly, for the decade 1986–1990 to 1996–2000 more than three quarters of the 69 thousand increase is explained.

Unemployment was rising in the late 1970s, but falling in the late 1990s, and this accounts for a rise of 13.4 thousand per annum in net immigration between these periods. The modest increase in British GDP per capita, relative to the country groups in the data, produced an increase of 2.7 thousand per annum in net immigration. But by far the major effect stems from the trends in inequality, which accounts for a rise of 36.6 thousand—about one third of the total increase. Over this period the UK gini coefficient rose by nearly eight percentage points (from 0.247 to 0.323), whereas the average foreign gini increased by just one percentage point. Thus the dramatic effect of inequality was entirely due to rising UK inequality rather than to falling inequality abroad.

Among the policy-related effects, the Europe dummy added more than 12 thousand to the annual net inflow, whereas those for other countries had smaller positive effects—largely due to South Africa. But the largest effect arises from the dummy representing UK immigration policy since 1998, which adds 33.8 thousand per annum to the net immigration average for 1996–2000.

For the shorter period since the late 1980s, the unemployment effects are reversed. UK unemployment was falling faster in the late 1980s than it was in the late 1990s, so that its contribution to the change between periods is negative. The effect of rising relative income was to generate an extremely modest increase of 1.8 thousand. The effects of rising relative UK inequality, although smaller than over the longer run, still account for nearly 20% of the observed rise in total net immigration. Finally, the effects of the dummies for European and UK policy account for a two thirds of the increase in net immigration since the late 1980s.

<sup>23</sup> This is just a linear decomposition where the estimated coefficients are applied to the differences in the data means for the 13 country groups and then multiplied by 13 to sum up to the aggregate.

## 9 Conclusion

Five main conclusions follow from the results presented in the preceding sections. They are as follows:

- A simple empirical migration model, which includes income distribution, as well as factors such as relative income and unemployment, is supported by the data and gives results which accord closely with the predictions of the theory.
- The same model can account for both the inward flows of foreign citizens and the outward flow of British citizens, both gross and net, although the parameter values differ between the two groups.
- Whereas immigration policies at home and abroad undoubtedly condition the effects of economic variables, the effects of major shifts in policy can also be discerned.
- The explanatory variables can predict most of the rise in UK immigration since the late 1970s and over the shorter period since the late 1980s.
- Although income and unemployment variables contribute to this explanation, the key variables are rising inequality in the UK and the policy dummies for Britain and the EU.

How can we interpret these results? Relative inequality has the largest effects on the declining net emigration of British citizens. Immigration policies in several key destination countries became increasingly skill-selective from the 1970s. Whereas this reduced the ability of the low skilled to emigrate, the increasing relative return to skills in Britain that is reflected in rising inequality reduced the incentive for the high skilled to emigrate. Thus the skill content of emigration did not rise any faster than the skill content of immigration, but total net emigration declined.

The policy effects are more difficult to interpret because these are represented by dummies. Growing integration and falling barriers to migration within the EU clearly have raised the both immigration of European citizens to Britain and emigration of British citizens to Europe. But the sharp increase in net immigration of foreign citizens in recent years has occurred across the board, and this appears to be due to more permissive UK immigration policy.

What of the future? Because unemployment is unlikely to keep falling, because relative income effects on immigration are small, and because the rise in inequality has largely ceased, it seems unlikely that these forces will cause a further substantial increase in net immigration. It seems more likely that future increases in net immigration will be largely the result of changing immigration policies. Given the large effects that the modest changes in the late 1990s had on the numbers, it seems likely that the more expansionary policies that became effective from 2003 will have an even larger effect.

It is appropriate to conclude on a note of caution. This study is the first attempt to provide econometric estimates that account for cross-section and time series variation in UK net immigration. The findings presented here will no doubt be modified and refined by future research. But there are major limitations on what can be achieved with the limited data available, and improvements in the published migration data are badly needed. From a research perspective, further effort should

also be made to characterise immigration policies and to examine the effects of policy not only on the number of immigrants but on the flow of human capital.

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## Appendix: The International Passenger Survey

The International Passenger Survey (IPS) is the only comprehensive source of UK international migration statistics. It has been taken in its present form since 1964 and comprehensive tabulations have been published annually by the Office for National Statistics as *International Migration* since 1974. It is based on interviews with a sample of passengers arriving and departing at UK ports, airports and the channel tunnel. The results are used for a variety of purposes including estimates of tourism and of components of the balance of payments. As noted in the text, the definition used to identify a migrant is a person who is arriving or departing for an intended stay of at least a year, having previously spent at least a year overseas (for arrivals) or in the UK (for departures). The advantages of the IPS are that it measures both immigration and emigration and that it does not depend on visa status. The disadvantage is that it is based on a small sample and is therefore subject to sampling error.

Passengers arriving from and departing to overseas countries are randomly sampled in shifts between 6 a.m. and 11 p.m. To boost the number of migrants in the survey, some shifts proceed to the full interview only when the individual is identified as a migrant. The results are then grossed up to the aggregate using a complex weighting system based on factors that reflect the probability of being sampled and with an allowance for 'out of hours' arrivals and departures. To illustrate, in 2001 there were 256,000 interviews of which approximately 1% were identified as migrants. These are about 0.5% of the grossed-up figure for total migrant flows (*International Migration 2001*, p. 34–5). Sampling errors are calculated for total migration and its components. In 2001 the standard error was 4.1% for the migrant inflow and 5.2% for the migrant outflow. Not surprisingly the standard errors are far larger for sub-aggregates. For inflows, the average standard error for 15 origin regions is 17%, whereas for inflows the average standard error by destination region is 24.4% (*International Migration 2001*, p. 30). Thus there is a large margin of error in any particular sub-aggregate figure for a single year. Nevertheless, because, by construction, these errors are random it is still valid to use the data as a left-hand side variable in regression analysis.

Non-response to questions is generally quite small (effectively zero for categories such as citizenship and last or next residence). But there are some systematic biases. There are those who say they intend to stay for less than a year but end up staying longer (visitor switchers) and those who say they intend to stay for more than a year but leave earlier. In addition, there are asylum seekers (and others) who often enter (and leave) clandestinely and to that extent are not captured in the survey. Finally, there are migrants to and from the Republic of Ireland who are not

surveyed and therefore do not appear in the IPS data. The ONS uses other sources to adjust the total inflows and outflows from the IPS to obtain total gross and net migration figures, but until very recently, those adjustments have not been carried through to the sub-aggregate data. Thus any analysis of sub-aggregate data over the longer term has to be conducted using the unadjusted IPS figures.

For 1999 onwards, certain improvements were made to the system of weighting the IPS responses, and routes to and from Ireland are now included in the survey. But more radical adjustments were made to the data for the 1990s following the 2001 census. The census produced a lower population figure in 2001 than the annual estimates constructed from births, deaths and net migration predicted. Part of this was due to the over correction of the undercount in the previous benchmark, the 1991 census (evidently a result non-response due to the poll tax). But the ONS also believes that net immigration in the 1990s was overestimated and has revised total net immigration downwards by 351,000 for the decade. Most of this revision applies to the adjustments to the IPS (visitor switchers, asylum seekers, etc.) rather than to the IPS itself. But IPS net immigration is also revised down by 12,600 per annum, largely as a result of changes to the weighting adjustments.

The recent revisions suggest that IPS inflows were underestimated and outflows were overestimated during the 1990s. But those revisions have not been carried back to the 1980s and earlier, and it is far from clear why the flaws in the survey adjustments should apply only to the 1990s. Given that the survey methodology has not changed, it seems safer to use the data as reported on a consistent basis rather than including the adjustments for the 1990s.

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