IMMIGRANT SELECTION IN THE OECD

By

Michèle V. K. Belot
(University of Essex)

and

Timothy J. Hatton
(University of Essex and Australian National University)

December 2010

ABSTRACT

The selection of immigrants by skill and education is a central issue in the analysis of immigration. Since highly educated immigrants tend to be more successful in host country labour markets and less of a fiscal cost it is important to know what determines the skill-selectivity of immigration. In this paper we examine the proportions of highly educated among migrants from more than 70 source countries who were observed as immigrants in each of 21 OECD countries in 2000/1. We develop a variant of the Roy model to estimate the determinants of educational selectivity by source and destination country. Two key findings emerge. One is that the effects of the skill premium, which is at the core of the Roy model, can be observed only after we take account of poverty constraints operating in source countries. The other is that cultural similarities, colonial legacies and physical distance are often more important determinants of the proportion of high-educated immigrants from a source country to an OECD destination than wage incentives or selective immigration policy.

Acknowledgements: We are grateful for help and comments from Frederic Docquier, Jean-Christophe Dumont, Denvil Duncan, Jonathan Temple and Rob Wells. We also thank two anonymous referees for their helpful and constructive advice. This paper is part of the CEPR Project on Migration and Mobility of Labour supported by the EU research network on Politics, Economics and Global Governance: the European Dimensions (PEGGED).

Introduction

In this paper we examine, and attempt to explain, the selection of immigrants by education to OECD countries from a wide range of source countries. The immigration literature has been much concerned with the mechanisms involved in immigrant selection, including economic incentives, immigration policy barriers and constraints operating in source countries. The debate has been fuelled by concerns about the performance of immigrants in developed country labour markets and the general finding that the higher are the skills of immigrants, the higher are their earnings and employment probabilities, the more positive is their net fiscal contribution, and the more positive is public opinion towards them and towards immigration more generally (Boeri, 2010). Not surprisingly a number of leading immigration countries have moved towards greater skill selection in their immigration policies.

These trends have been accompanied by renewed interest in the 'brain drain'. The gradual increase in migration from poor to rich countries, together with trends in skill-selective immigration policy, have given rise to concerns that some of the poorest countries are being disadvantaged as their best and brightest leave to seek employment in high-wage OECD countries. A series of important studies have focused on whether the process of high-skilled emigration improves education incentives in poor countries (Beine at al. 2001; 2008; Docquier et al., 2007; Docquier and Rapoport, 2009). They find positive effects on the share educated (migrants plus non-migrants) although some small, poor countries with high emigration still suffer a net loss of human capital. Another literature has examined the effects of the size and composition of diasporas on

development through generating remittances and creating trade as well as through return migration and technological transfer (Özden and Schiff (eds.) 2006).

Here we focus on what explains the educational selectivity of out-migration across source countries and what combination of incentives and policy determines the skill content of immigration among the main destinations. The basic framework used in models of skill selection is the Roy model (Roy, 1951), which was introduced to the literature on international migration in a series of influential papers by Borjas (1987, 1994, 1999). The essence of the Roy model is illustrated in Figure 1, which plots the destination and origin wage-by-skill schedules (assumed to be in present values) facing potential emigrants. In this illustration, the destination wage schedule, $w(y)$, is increasing in the individual's skill or education level with a slope that reflects the return to education. If the wage schedule in the origin country is $w(x)_1$, the return to education is lower in the origin than at the destination. Only those with an education level exceeding s_1 will have an incentive to migrate and hence there will be positive selection. By contrast if the origin wage schedule is $w(x)_2$ then only those with education below s_2 will emigrate and there will be negative selection.

The position of the home country reservation wage schedule $w(x)$ depends on a number of other factors that can be considered as costs. One is the individual's preference for (or compensating differential in favour of) the home country, which may differ across individuals thereby introducing greater heterogeneity into selection by skill. A second component is the direct cost of migration, which also displaces $w(x)$ upwards and may vary by skill level. A third is the cost associated with gaining admission through the policy filter, which could also vary across individuals and by skill level. Finally, some

individuals may be constrained from migrating by poverty, an issue to which we return below. Two points follow from this analysis. One is that even if the wage schedule in country *y* lies everywhere above the wage schedule in *x* (country *x* is much poorer) the other components may still ensure that the reservation wage schedule crosses the destination wage schedule. Thus selection can still be important even when income gaps are large. The second point is that these other components may influence the slope of the reservation wage schedule $w(x)$ so that the relative slopes of the 'raw' (or unadjusted) wage schedules may not be a good guide to the skill-selectivity of migration from *x* to *y*.

In his studies using this framework Borjas (1987, 1992, 1994, 1999) finds that the adjusted wage differential for recent immigrants to the US depends negatively on source country inequality and positively on average source country income, which implies that immigrants from poor and unequal countries are negatively selected relative to immigrants from other source countries. Comparison between the US and Canada suggests that skill-selective immigration policies might be important, although differences in immigrant skills are driven mainly by source country composition rather than by differences in the selectivity of migrants from a given source country (Borjas 1993; Antecol et al., 2003). However, migrants to the US from Puerto Rico are less educated than non-migrants and the inflow to Puerto Rico is more educated than the source population (Ramos. 1992; Borjas, 2008). This is consistent with higher returns to education in Puerto Rico as compared with the US, in the absence of immigration policy barriers between the two countries. In a study of 32 source countries Feliciano (2005) finds that Puerto Rico is the only country for which migrants to the US are negatively selected on education relative to the source population. This suggests that the presence of

immigration policy increases positive selection, although there is still a weak negative relationship between the degree of positive selection and source country inequality.[1]

Much of the recent attention has focused on the large flow across the southern US border from Mexico, a much poorer country with a higher return to skills. Estimating the wage distribution for migrants had they stayed in Mexico, Chiquiar and Hanson (2005) find that migrants are drawn disproportionately from the middle and upper middle of the income distribution and that they are over-represented among those with 10-15 years of education (see also Orrenius and Zovodny, 2006; Caponi, 2007). This could be accounted for by the low-educated facing higher migration costs, which in terms of Figure 1, could make the reservation wage function $w(x)$ convex. Other studies have stressed the effects of migration networks in reducing costs and increasing the returns to migration. Thus McKenzie and Rapoport (2010) find that networks identified in the source country increase the proportion of low educated migrants, while Munshi (2003) identifies the positive effects of networks at the destination on the employment probabilities and the occupational status of Mexican immigrants. Fernández-Huertas Moraga (2010) finds that a combination of network effects and wealth constraints explains the selection of migrants from rural Mexico.

These studies have provided much insight into migrant self-selection at the micro-level. They stress the fact that migration costs are important and that policy barriers could be important in raising the costs e.g. of illegal migration. But they offer limited insight into the observed differences in the selectivity of migration across countries of

[1] Interestingly, Aydemir (2003) finds that, for migration from the US to Canada, the high-educated are less likely to apply but are more likely to be accepted through Canada's points system. Overall they are positively selected because the effect of skill-selective immigration policy outweighs the incentive effect that would otherwise favour low skilled migration.

immigration.[2] Less still do they explain why the skill-or education-content of emigration differs so much among countries of origin. Here we focus on the factors that drive the educational selectivity of migration across both sources and destinations—something that has been neglected until recently. One particular issue is the role of wealth or income constraints that lead to positive selection from poor countries despite the higher returns to education at home. This could be an important factor in the brain drain, and it is a key focus in the analysis we present below.

Several recent papers have explored new datasets on the stock of immigrants observed in OECD countries by source country and by educational attainment (Dumont and Lemaître, 2004; Docquier and Marfouk, 2006). Docquier et al. (2006) estimate models of the relative emigration rate of high- to low-educated migrants from source countries to the OECD as a whole. Focusing on source country characteristics they find that positive educational selection is associated negatively with the proportion with post-secondary education and negatively with per capita GDP. These results would be consistent with poverty constraining the low-educated from emigration. Using bilateral data on the change in the migrant stock from the same data source, Beine et al. (2009) find that the larger is the initial emigrant stock the less positively selected is the subsequent flow. Both studies also find that the distance to OECD destinations has a positive effect on educational selection, together with other variables. These results suggest that migration costs are more of a constraint for low skilled migration. However

[2] Several studies use survey data on emigration intentions. Leibig and Sousa-Posa (2004) find that for a set of developed countries the stated intention to emigrate is increasing in the individual's education but the effect is smaller the higher is the return to education at home. For five North African countries Van Dalen et al (2005) find that the most important single determinant of emigration intentions is the individual's expectation of income gain.

the effects of the absolute poverty level are not measured directly, and as the relative return to education is not included, there is no assessment of the Roy model.

Brücker and Defoort (2009) investigate the determinants of skill selectivity using data by source country and by 6 OECD destination countries at five year intervals over the period 1975-2000. They use source and destination gini coefficients as proxies for the returns to skills and they include a series of measures of geographical and cultural distances between countries. They find that both destination and source country inequality have positive effects; the latter being a priori inconsistent with the Roy model. This result is found in the presence of GDP per capita in source and destination as well as other bilateral controls. They rationalise this result by introducing an extended version of the Roy model which allows for a negative correlation between skill levels and moving costs. Thus the skilled find it more attractive to emigrate despite the higher return to skills in the home country. However, the relationship between migration costs and skill-selectivity is not tested directly.

Grogger and Hanson (2008) examine the stock of immigrants by level of education by source country and OECD destination country for 2000/1. They estimate separate equations for the educational selectivity of migration and for the sorting of migrants between sources and destinations. They focus on absolute wage gaps (or skill prices) between destination and source countries for each skill level as the incentive to emigrate. Thus the absolute gap could be higher for skilled emigrants, even if the relative gap (or wage premium differential) is not (see also Rozenzweig, 2010). They find that educational selection can be explained by absolute wage gaps without reference to poverty constraints, and that the absolute gap outperforms the relative gap. In addition

educational selectivity is positively associated with sharing a common language and with distance, and negatively with contiguity and with colonial links. Immigration policy is proxied by the share of asylum seekers, which has a negative effect on both the educational selection of migrants and sorting across destinations.

In what follows we use the database described by Doquier and Marfouk (2006) and Docquier et al. (2009), which counts migrants to the OECD by destination, by source and by education level, and which has been used in a number of the papers cited above.[3] We use the framework of the Roy model and to focus on educational selectivity from the source country perspective and on the effects of immigration policies in OECD destinations.

Educational Selectivity by Source and Destination

The data covers the stock of foreign-born in all OECD countries in 2000/01 from all source countries by three levels of education, and is discussed in more detail in the data appendix. Table 1 looks at these migrants from the destination country perspective. The first column shows each destination country's share of the foreign born aged 25 and over in the OECD. The United States is by far the largest host country with 41.6 percent of the total, while other traditional immigration countries, Australia, Canada and New Zealand account for a further 15.8 percent. The EU-15 accounts for 34.3 percent of the OECD total with Germany the largest individual host country, followed by France and the UK. Other countries in Eastern Europe and elsewhere contribute modestly to the total. The second column shows, for each country, the percentage of the population aged 25 and over that is foreign-born. As is well-known, Australia, Canada and New Zealand

[3] In an earlier version of this paper we used a similar database produced by the OECD (Dumont and Lemaître, 2004). This produced results that are broadly similar to those reported below, see Belot and Hatton (2008).

have immigrant shares of over 20 percent--rates that are matched only by Switzerland and Luxembourg. Less well known is the fact that seven other members of the EU-15 have immigrant shares that are over 10 percent and are comparable with that of the United States at 14.3 percent.

The third column of Table 1 reports the percentage of foreign-born adults in each host country that is tertiary educated. Among the countries with skill-selective points systems, Canada, and Australia have ratios of over 40 percent, which are especially high when compared with European countries many of which have ratios of less than 20 percent. Notable exceptions in Europe are the UK, Ireland, Greece and Luxembourg, with ratios of over 30 percent. Outside of Europe there are high ratios for some other high-income countries such as Japan and the USA.

Clearly, the education content of a destination country's immigration depends in part on the shares of different source countries in total migration. Column (4) shows the result of applying source country immigration weights to source country high-education shares (emigrants plus residents). This gives an indication of the extent to which each destination draws migrants from relatively high-education sources. As is well known, the proportions of high-educated are much lower in the source country populations than they are for migrants, and so the figures in column (4) are typically below those in column (3). However the difference between these figures varies widely and the correlation coefficient between columns (3) and (4) is only 0.23. This suggests that much of the variation in the skill content of immigration is due to the way that immigrants from a given source are selected rather than simply the underlying source country composition.

Table 2 examines migrants to the OECD from the perspective of the source region. The first column shows the percentage of OECD immigrant stock that is accounted for by different source regions. Nearly half of these (48 percent) are intra-OECD migrants, while in terms of continents, 27.1 percent come from the Americas, 37.6 percent come from Europe (including the former Soviet Union) and 12.7 percent come from Asia (including the Middle East). The second column shows the shares of high-educated migrants to the OECD from different source regions. Here the pattern is slightly different, with Asia accounting for a greater share of high-educated migrants than of all migrants.

The third column shows for each sending region the percentage of its emigrants that are high educated. As might be expected, the ratios are relatively high (35 percent or above) for North America, Australia/New Zealand and Northwestern Europe. But the education content is also high for emigrants from most of Asia, from the former Soviet Union and even from Sub-Saharan Africa. To some degree this is reflected by the (migrant weighted) percentages of high educated (migrants plus residents) in each region's source countries (column 4). Although the correlation coefficient between the country level data underlying columns (2) and (3) is 0.5, there are substantial deviations. For countries in Asia and Africa the high-educated share among emigrants is far higher than that of the overall source country populations. In some other cases such as Central America, Southern Europe and North America the gap between emigrants and source country populations much smaller. These comparisons immediately raise the question of how such large differences in educational selection across countries and regions can be accounted for.

Theoretical Framework

Selection by skill has been a central focus of much of the literature that employs some variant of the Roy model. Here we use a modified version of this framework. We characterise the probability that an individual migrates as depending on three components. The first is the probability that the individual finds it in his or her interest to migrate on cost-benefit grounds. The second is immigration policy through which migrants are screened. And third there is selection at the origin, arising from the fact that some individuals may be too poor to afford the costs of migration.

The incentive for individual *i* to migrate, I_i, is the difference between the utility from the economic gains and the non-economic loss or compensating differential. Assuming logarithmic utility we can express the incentive to migrate as

$$I_i = \ln w_{yi} - \ln(w_{xi} + c) - z_i \text{, or } I_i = \ln w_{yi} - \ln w_{xi} - \ln(1 + \frac{c}{w_{xi}}) - z_i \qquad (1)$$

where w_y and w_x are earnings in the destination and origin respectively and c is the direct cost of migration, all assumed to be in present value terms. z is the compensating differential representing the individual's non-economic preferences. In order to capture heterogeneity in individual preferences we assume that z_i is a random variable with mean $\bar{z} > 0$ reflecting a positive average preference for the origin country.

Earnings in origin and destination depend on education and a random unobserved productivity component, while earnings at the destination also depend on a term representing the 'cultural' distance between the origin and the destination:

$$\ln w_{xi} = \alpha_0 + \alpha_1 s_i + \varepsilon_{xi} \text{, and } \ln w_{yi} = \beta_0 + \beta_1 s_i - u(\beta_2 - \beta_3 s_i) + \varepsilon_{yi} \qquad (2)$$

where s_i is individual i's education level, which we assume is bounded by $0 \leq s \leq 1$ (later we will assign the value 1 to the high educated and 0 to the low educated). We assume that the unobserved components of the wage ε_x and ε_y have mean zero and are uncorrelated with the individual's preference for migration. The term u is a measure of 'cultural distance' between the source and the destination that affects the transferability of educational skills. The greater the cultural distance the less transferable are these skills and therefore the lower is the wage in the destination. High education may help bridge the culture gap so that if $\beta_3 > 0$ the wage penalty is lower for the more highly educated. On the other hand cultural difference may have smaller effects on productivity in low education jobs where there is little human capital to be transferred, in which case $\beta_3 < 0$.

We characterise the direct cost of migration simply as $d(1-\gamma s_i)$, where d is a measure of the direct costs, which decline with education level. Hence the individual's incentive to migrate is:

$$I_i = \beta_0 - \alpha_0 + (\beta_1 - \alpha_1)s_i - \beta_2 u + \beta_3 u s_i + \varepsilon_{yi} - \varepsilon_{xi} - d + d\gamma_1 s_i - z_i \qquad (3)$$

Immigration policy acts as a screen and it may be skill selective. We interpret immigration policy as raising the costs of migration such that the policy cost for individual i is:

$$P_i = \delta_0 - \delta_1 s_i \qquad (4)$$

If policy is not skill-selective then $\delta_1 = 0$. An across-the-board toughening in policy raises the policy cost of immigration by increasing δ_0, while an increase in skill-selectivity holding overall toughness constant can be achieved increasing both δ_0 and δ_1.

An important feature of our model is the poverty constraint; people living close to subsistence find it much more difficult to migrate. While it might seem possible to

borrow, it will be difficult to provide collateral based on future earnings when the purpose of the loan is to leave the country. Thus, the greater are the migration costs, the higher is the general incidence of poverty in the origin country, and the more likely a given individual is to be poor, the less likely that he/she will be able to migrate. We express the poverty constraint effect as the product of these three factors:

$$R_i = C_i r(1-s_i) \tag{5}$$

where r is the general poverty rate and C_i represents the total cost of migration including both the direct cost and the policy cost. These costs could be prohibitive for a low educated individual in a poor country facing sufficiently high migration costs. Substituting direct and policy costs as defined above, the poverty cost can be expressed as:

$$R_i = (d + \delta_0 - (d\gamma_1 + \delta_1)s_i)r(1-s_i) \tag{6}$$

Provided that the sum of migration costs is positive, the poverty cost R_i is increasing in the poverty rate and decreasing in s up to $s = 1$. Putting together the incentive to migrate, the policy cost and the poverty cost, the probability that individual i will migrate is:

$$\begin{aligned}\Pr(m_i = 1) = \Pr(&\beta_0 - \alpha_0 - d - \delta_0 - \beta_2 u + (\beta_1 - \alpha_1 + \beta_3 u + d\gamma + \delta_1)s_i \\ &-(d + \delta_0 + (d\gamma + \delta_1)s_i)r(1-s_i) > z_i + \varepsilon_{xi} - \varepsilon_{yi})\end{aligned} \tag{7}$$

We characterise the total migration rate as depending on these variables such that:

$$\begin{aligned}\frac{M_T}{N_T} = &\beta_0 - \alpha_0 - d - \delta_0 - \beta_2 u + (\beta_1 - \alpha_1 + \beta_3 u + d\gamma + \delta_1)s \\ &-(d + \delta_0 - (d\gamma + \delta_1)s)r(1-s) - \bar{z}\end{aligned} \tag{8}$$

where s is the mean of s_i . We assume two education levels, high educated, $s_i = 1$, and low educated, $s_i = 0$, and thus s is the share of high-educated in the population. The migration rate for high-educated individuals is:

$$\frac{M_H}{N_H} = \beta_0 - \alpha_0 - d - \delta_0 - \beta_2 u + \beta_1 - \alpha_1 + \beta_3 u + d\gamma + \delta_1 - \bar{z} \quad (9)$$

And the migration rate for low-educated individuals is:

$$\frac{M_L}{N_L} = \beta_0 - \alpha_0 - d - \delta_0 - \beta_2 u - (d + \delta_0) r - \bar{z} \quad (10)$$

Thus the difference between the migration rates of the high- and the low-educated is:

$$\frac{M_H}{N_H} - \frac{M_L}{N_L} = \beta_1 - \alpha_1 + \beta_3 u + d\gamma_1 + \delta_1 + (d + \delta_0) r \quad (11)$$

As in the Roy model, an increase in the return to skills in the destination relative to the origin increases positive selection. In this specific case, an increase in $\beta_1 - \alpha_1$ increases migration among the high educated but not among the low educated. Cultural distance affects selection through β_3, which could be positive or negative. Positive selection is also related to direct migration costs through $d\gamma_1$ and through the policy selectivity term δ_1. Finally, the degree of poverty, r, reduces unskilled migration and therefore increases positive selection, both directly and through the interaction with migration costs.

Estimating framework and data

We use the theoretical approach above to motivate an empirical model of migrant selectivity from country x to country y by specifying the following estimating equation:

$$\ln\left(\frac{M_{Hyx}/M_{Lyx}}{N_{Hx}/N_{Lx}}\right) = a_0 + a_1(\ln\frac{w_{Hy}}{w_{Ly}} - \ln\frac{w_{Hx}}{w_{Lx}}) + a_2 Cult_{yx} + a_3 Dist_{yx} + a_4 Pov_x + a_5(Dist_{yx} \times Pov_x) + a_6 Pol_y + \eta_{yx} \quad (12)$$

The dependent variable is the log of ratio of high- to low-educated migrants from x to y divided by high- to low-educated in the population of origin country x. This measures the

educational selectivity of migration from *x* to *y*. The first of the explanatory variables is the difference in the wage premium for high over low educated workers between the destination and source countries. The basic test of the Roy model is that $a_1 > 0$. Because of the restriction imposed on the two wage ratios this variable varies by origin and by destination. The second term is cultural similarity which is specific to each country pair and which could be positive or negative in sign. The distance between *x* and *y*, which varies across bilateral pairs, is a proxy for direct migration costs. Since these are less of a deterrent to the high educated we expect that $a_3 > 0$.

The fourth and fifth terms capture the poverty constraint that affects the low educated in poor countries. The effect of poverty is to increase high-education selectivity—the more so the higher are the costs of migration. Hence we expect $a_4 > 0$ and $a_5 > 0$. The interacted term varies by source and destination but the poverty rate varies only by the origin country. Selective immigration policy, Pol_y, is destination specific and it may be skill selective. We first capture this with a dummy for each destination country, which will also absorb any other destination-specific effects. But further below we investigate some direct measures of skill selective immigration policy.[4]

The data that we use for the numerator of our dependent variable is the ratio of tertiary educated to those with secondary or lower education among migrants aged 25 and over from a source country to an OECD destination country. As noted earlier, this stock data for the year 2000/1 is from the database developed by Docquier and colleagues. The denominator is the ratio of tertiary to secondary or lower educated among of the source

[4] The theory set out in the previous section considers only one destination but in our empirical model we estimate migration from a given source country to a number of different destinations. Third country effects could potentially matter but, if cross-destination effects are symmetric, the alternatives to any given destination are constant across sources and can be absorbed by the destination dummy.

country population aged 25 and over, where the emigrants have been added back to the source country population in order to obtain the population at risk.[5] Studies of the migrant flows often find that the initial stock is the most important single determinant, and thus current migration depends on migration in the recent past.[6] By analysing the stock we focus on long run determinants, and so the explanatory variables are constructed from data stretching back for two decades.

Migration studies sometimes use the gini coefficient of household income as a proxy for the return to skills.[7] However this variable is far from ideal as it measures income from all sources and it reflects the proportions at each income level. In order to better capture the relative price of skills we use the ratio of the wage in a set of occupations that normally require some tertiary education to the wage in a set of unskilled occupations. These are calculated from Freeman and Oostendorp and cover the years 1983 to 2000. Gross wages may be misleading as a measure of the overall migration incentive and there is evidence that migration is influenced by differences in income tax rates (Egger and Radulescu, 2009). In order to adjust gross wage rates to net we use a new database on international income tax rates kindly provided by Sabrianova Peter et al. (2009). We adjust the skilled wage by the average tax rate at the third quartile of income and the unskilled wage rate by the average tax rate at the first quartile.

The percentage in poverty is based on the World Bank's estimate of the proportion of population living with incomes of less than $2 per day. Because this is only

[5] No adjustment is made for the brain gain effects of emigration on the non-emigrant population; if there was some educational response then the effects we estimate would be downward biased.
[6] Studies of annual gross migration flows that stress migrant stock effects in include Clark et al. (2007) and Pederson et al. (2008). Using the data source examined here, Beine et al. (2009) find that the migrant stock is also an important determinant of the skill composition subsequent migration.
[7] These include Borjas (1987) Leibig and Sousa-Poza (2004), Clark et al. (2007) and Brücker and Defoort (2009).

available for recent years we develop a long run average poverty rate using the share of agriculture in GDP as a predictor. Across the source countries in our data for which the World Bank poverty share is non-zero the correlation between poverty and the agricultural share in 2000 is 0.85. We therefore apply the prediction from a regression of the $2 per day poverty rate on the agricultural share to the average agricultural share over the years 1980 to 2000.

The costs of migration are reflected in the distance between the capitals of the source and destination countries. This is entered in logarithmic form so that marginal migration costs decline with distance. Cultural distance between source and destination pairs is represented by linguistic proximity, which is based on the number of common nodes on the linguistic tree that are shared between one language and another. Further details of the definition and sources of the variables can be found in the data appendix.

Results for Educational Selection

Our estimates of different variants of the model appear in Table 3. Column (1) shows the results for a specification that includes the wage premium differential, adjusted for source and destination taxes, and the variables that reflect geographical and cultural distance between the source and destination countries, but excludes source country poverty rates. This produces an insignificant negative coefficient on the wage premium differential, which is the opposite of what the Roy model would predict. One reason is that, across source countries, the net wage premium is positively associated with poverty; the correlation coefficient is 0.56. Thus the source country wage ratio could be capturing a mixture of the 'true' negative effect on selection operating through the wage premium differential and the positive selection effect operating through the poverty constraint.

Column (2) of the table adds the poverty rate and the interaction between distance and poverty, both of which should have positive effects according to our model. The results support the hypothesis that source country poverty is associated with positive selection. We find that the estimates of a_4 and a_5 are both positive and significant. Introducing these poverty variables has a dramatic effect on the coefficient of the wage premium differential, which now becomes positive and significant. That is, controlling for poverty, source countries with a higher wage premium are associated with more negative selection. However, the estimated effect of skill selection with respect to the wage premium is relatively modest; a ten percentage point increase in the wage premium differential would increase the share of high-skilled emigrants in the total by about half a percentage point.

Consistent with other studies, we find that distance, as a proxy for migration costs, has a positive effect on educational selection, an effect that remains strong in the presence of the interaction with poverty. The negative effect of colonial history may reflect the long-term effects of the initially low barriers to immigration from post-independence colonies that generated persistent streams of low-skilled migrants. This effect is large, reducing the share of skilled migrants in a given migration stream (evaluated at the mean skill share) by 23 percentage points. We have no clear prediction for the effects of linguistic proximity. On the one hand high education may make it easier to bridge the linguistic gap, in which case closer linguistic proximity should lead to negative skill selection. On the other hand for the lower educated with fewer skills to transfer, linguistic distance may be less of a barrier, in which case proximity may lead to positive selection. The positive coefficient on linguistic proximity in column (2) of Table

3 suggests that the transferability of human capital may be easier when language is less of a barrier. In our initial estimates we also included a common language dummy. But this was insignificant in the presence of linguistic proximity, as the two variables are highly correlated (correlation coefficient 0.75), and so it was dropped.

As noted earlier Grogger and Hanson (2008) specify their model as linear utility rather than logarithmic utility. Thus they use the absolute wage gap, rather than the relative gap in the selection equation and they omit any direct measure of poverty. In columns (3) and (4) of Table 3 we investigate this alternative functional form by expressing the wage gap as $(\mathbf{w_{Hy}} - \mathbf{w_{Hx}}) - (\mathbf{w_{Ly}} - \mathbf{w_{Lx}})$, where tax adjusted wage rates are measured in thousands of purchasing-power-parity adjusted US dollars. In column (3), where poverty and its interaction with distance are excluded, we find that the absolute wage gap produces a highly significant positive coefficient, which is consistent with the findings of Grogger and Hanson. Because the absolute wage gap tends to be larger for the skilled than for the unskilled from poor countries it captures much of the positive selection. If this were the 'correct' specification then the poverty variables should not be significant. However in column (4) both the poverty coefficients are positive and the interaction with distance is significant. Furthermore the coefficient on the absolute wage gap becomes negative, even though it has only a modest correlation with poverty (-0.16).

Alternative specifications

The results so far suggest a strong role for poverty in explaining the patterns of skill selection, and in Table 5 we explore a number of alternative specifications to check the robustness of the key results. In columns (1) and (2) the dependent variable is

disaggregated by sex. Overall the results are rather similar to those for all migrants. For women the coefficients on the wage premium differential and linguistic proximity are smaller than for men. This may be because women more often move for family reunification. Poverty matters more for women while the interaction with distance matters more for men.

One concern is that some migrants received their education in the destination country and therefore that the education mix is determined partly by post-migration conditions. This is mitigated to some degree by the fact that the skill composition of immigrants is restricted to those aged 25 and over. But as an alternative we used a version of the data that has been adjusted for those who could have received all or part of their education at the destination, based on estimates of the age of arrival. As column (3) shows the result is very similar to that for the unadjusted data in column (2) of Table 3. In column (4) the dependent variable is the ratio of tertiary educated migrants to those with only primary education (leaving out those with secondary education). This would be more consistent with the high/low wage premium differential, but again result is similar to that in column (2) of Table 3.

In columns (5) and (6) we use different versions of the wage differential. As noted above it has been suggested that tax rates play an important role in the incentive to migrate. Unlike other studies we use a comprehensive tax database that allows us to calculate net wages for both rich and poor countries. However column (5) shows that it makes only a marginal difference if gross wage differentials are used. Perhaps more important is the measure used for the (gross) wage premium differential. In column (6) we use the absolute difference between destination and source country gini coefficients as

a proxy for the wage premium differential. This gives a strong positive coefficient as the Roy model would predict and while some of the other coefficients are weaker, the share in poverty remains positive and strongly significant.

We have also experimented with alternative measures of poverty. In column (7) we use the share in extreme poverty--$1 per day rather than $2 per day. As might be expected the coefficient on poverty increases in size but otherwise the results are similar to column (2) in Table 3. Thus the results appear to be reasonably robust to the definition of poverty. However, one possible concern is that the source country skill mix in the denominator may be linked to poverty through a bi-directional relationship.[8] If so then introducing the level of GDP per capita (which is strongly correlated with source country skills) would be expected to have the same effects as poverty—but with a different interpretation. To test this hypothesis we introduce per capita GDP (from the Penn World Tables) in place of poverty, including the interaction with distance. As column (8) shows, when GDP is substituted for poverty the main effect is positive but the interaction is now significantly negative. As our model predicts a positive interaction effect, it seems that poverty is not just standing in for other effects that can be captured by GDP per capita.

The Effects of Policy in Destination Countries

As noted above, selective immigration policies can be viewed as a screening mechanism that imposes differential costs on potential immigrants by skill and education. Here the focus is on policies that influence the composition of immigrants rather than the total number. These policies include not only selection at the border but also behind-border policies that affect self-selection. It is widely believed that immigration policies

[8] A negative relationship between the denominator of the dependent variable in equation (12), N_{Hx}/N_{Lx}, and poverty could induce a positive bias to the coefficient α_4 and/or α_5 as a result of a causal link from low skills to poverty. Across the observations in our dataset the correlation between these two variables is -0.69.

that place greater weight on family reunification and refugees are likely to select lower skilled immigrants. Within the employment stream, the degree to which foreign qualifications and skills are recognised in the host country must also be considered as part of selective policy. More indirectly, the generosity of the welfare state is often seen as attracting less skilled migrants (Boeri et al, 2002; Di Giorgi and Pellizzari, 2009; Boeri, 2010).

Unfortunately we have no comprehensive indicator of the degree of selective policy across destination countries, and hence we rely on a set of proxies. To capture the generosity of the welfare state we use the share of social spending in GDP. In addition we use three indicators of skill-selective policy. The first is based on data from the *World Competitiveness Yearbook,* which reports the responses of business executives to a question on how far immigration policies permit the hiring of foreign employees. We interpret greater flexibility as representing more employment-friendly policy. The second relates to the restrictiveness of the country's policy towards professional workers (Nguyen Hong, 2000). We use the components relating to immigrants to construct a measure of the ease with which professionals can transfer their skills. The third indicator is a dummy for countries that select skills through a points system (Canada, Australia and New Zealand). By contrast, the non-selective effect of a common labour market is captured by share of the time between 1980 and 2000 that two countries allowed free labour mobility.

The regressions presented in Table 5 include policy indices in place of the destination country dummies, but are otherwise equivalent to column (2) of Table 3. Note that the coefficients on the non-policy variables are little changed by the exclusion of the

destination dummies. In the first column, the size of the welfare state has a negative selection effect, as predicted, but the coefficient is not significant. However it increases in size and significance when the variables for employment flexibility and low restrictions on professionals are added in column (2). The ease with which professionals can transfer their skills appears to be the most important effect and it probably reflects more widely the transferability of specific skills. This effect is potentially important: a one standard deviation increase in the index is associated with a four percentage point increase in the share of high-skilled in total migration. In comparison, the welfare magnet effect of a five percentage point increase in the social expenditure share increases the share of high skilled in total migration by about 2.5 percentage points.

In column (3) we add the free mobility dummy which gives a positive coefficient, contrary to expectation. This variable relates to the EU and it suggests some positive selection of inter-EU migrants. Column (4) adds the dummy for three countries with points systems, which gives a positive coefficient as expected. This implies that shifting to a points system raises the share of high-skilled in total migration by about six percentage points. These results suggest that the skill content of migration has been shaped, at least in part by policy. However we do not have measures that capture policy on family reunion and refugees, which are not dependent on the ex-post composition of arrivals. It seems likely that, if such policies could be adequately measured, they would have larger effects than policies relating only to skill selectiveness within the employment stream.

Conclusion

In this paper we have examined, and attempted to explain, the selection by education of immigrants from a wide variety of source countries into the countries of the OECD. Since the labour market quality of immigrants is of increasing concern to developed-country governments, it is important to know what are the key forces determining the educational selectivity of immigration. Although considerable research has been devoted to differences in selection and outcomes for immigrants to a given destination (usually the US) there have been relatively few attempts to analyse this selection across source and destination countries. As a result it has not been possible to fully explore the predictions of standard migration theory.

Broadly speaking our results contain four main findings. The first relates to the Roy model, which predicts that the greater the return to skills in the destination as compared to the source country, the stronger will be the positive selection of immigrants by skill-level. This effect is not observed in the simplest model but it reappears once we allow for the fact that many potential immigrants in poor counties are constrained from migrating by poverty. This explains the paradox that migrants from poor countries, where the returns to education and skills are large, are strongly positively selected from among the source country populations.

Following from this, the second finding is that the costs and constraints are important in shaping the selectivity of migration. Distance, which reflects the costs of migration, and poverty, which reflects liquidity constraints, are both associated with more highly educated migration streams. A further implication suggested by theory is that the poverty constraint should bite harder where migration costs are higher. Our results strongly support the hypothesis that the interaction between poverty and distance

increases positive skill selectivity from a given source country. We also find that this effect is not adequately captured by recasting the wage incentive as the absolute wage gap rather than the relative wage gap.

Third, like other studies we find that cultural similarities and colonial legacies are important in shaping the skill content of migration. The net effect of linguistic proximity is positive indicating that human capital is more easily transferred between cognate language groups but it may also reflect wider cultural similarities. More important still are colonial legacies which probably reflect the persistent effects of postcolonial policies that gave preferential access to unskilled migrants from former colonies. These large negative effects are particularly important for European countries and help to explain their lower immigrant skills.

Finally we have investigated the effects of skill selective immigration policies in destination countries. Although our measures of selective policy are imperfect they do attempt to capture elements of post-immigration policy that shape migration incentives. We find some evidence for negative welfare magnet selection effects, particularly when we control for other policies. We also find that points systems and policies that encourage the transfer of professional skills have non-trivial positive selection effects. However these measures are only partial and do not capture the potentially large effects of policies towards family reunification and refugees. Thus, more definitive conclusions about the overall effects of policy on skill selection must await the development of more comprehensive indicators of policy.

References

Antecol, H., Cobb-Clark, D. A. and Trejo, S. (2003), "Immigration Policy and the Skills of Immigrants to Australia, Canada, and the United States," *Journal of Human Resources,* 38, pp. 192 - 218.

Aydemir, A. B. (2003), "Are Immigrants Positively or Negatively Selected? The Role of Immigrant Selection Criteria and Self-Selection," Statistics Canada: Unpublished paper

Beine, M., Docquier, F. and Rapoport, H. (2001), "Brain Drain and Economic Growth: Theory and Evidence," *Journal of Development Economics,* 64, pp. 275-289.

Beine, M., Docquier, F and Rapoport, H. (2006), "Measuring International Skilled Migration: New Estimates Controlling for Age of Entry," Washington DC: World Bank Research Report.

Beine, M., Docquier, F. and Rapoport, H. (2008), "Brain Drain and Human Capital Formation in Developing Countries: Winners and Losers," *Economic Journal,* 118, pp. 528.

Beine, M., Docquier, F. Özden, Ç. (2010), "Diasporas," *Journal of Development Economics,* (forthcoming).

Belot, M. V. K. and Hatton, T. J. (2008), "Immigrant Selection in the OECD," London: CEPR Discussion Paper 6675.

Boeri, T., Hanson, G. H. and McCormick, B. (eds.) (2002), *Immigration Policy and the Welfare State,* New York: Oxford University Press.

Boeri, T. (2010), Immigration to the Land of Redistribution," *Economica,* 77, pp. 651-687.

Borjas, G. J. (1987), "Self Selection and the Earnings of Immigrants," *American Economic Review,* 77, pp. 531-53.

Borjas, G. J. (1992), "National Origin and the Skills of Immigrants in the Postwar Period," in G. J. Borjas and R. B. Freeman (eds.), *Immigration and the Workforce: Economic Consequences for the United for the United States and Source Areas,* Chicago: University of Chicago Press.

Borjas, G. J. (1993), Immigration Policy, National Origin and Immigrant Skills: A Comparison of Canada and the United States," in D. Card and R. B. Freeman (eds.), *Small Differences that Matter: Labor Markets and Income Maintenance in Canada and the United States,* Chicago: University of Chicago Press.

Borjas, G. J. (1994), "The Economics of Immigration," *Journal of Economic Literature,* 32: pp. 1667-1717.

Borjas, G. J. (1999), "The Economic Analysis of Immigration," in O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics,* Vol. 3A (New York: North Holland).

Borjas, G. J. (2008), "Labor Outflows and Labor Inflows in Puerto Rico," *Journal of Human Capital*, 2, pp. 32-68.

Brücker, H. and Defoort, C. (2009), "Inequality and the Self-Selection of International Migrants: Theory and New Evidence," *International Journal of Manpower*, 30, pp. 742-764.

Caponi, V. (2010), "Heterogeneous Human Capital and Migration: Who Migrates from Mexico to the US?" *Annales d'Economie et de Statistique*, (forthcoming).

Chiquiar, D. and Hanson, G. H. (2005), "International Migration, Self-Selection and the Distribution of Wages: Evidence from Mexico and the United States," *Journal of*

Political Economy, 113, pp. 239-281.

De Giorgi, G. and Pellizzari, M. (2009), "Welfare Migration in Europe," *Labour Economics*, 16, pp. 353–363.

Deininger, K. and Squire, L (1996) "A New Data Set Measuring Income Inequality", *World Bank Economic Review*, 10, pp. 565-91.

Docquier, F, Lohest, O., and Marfouk, A. (2007), "Brain Drain in Developing Countries," *World Bank Economic Review*, 21, pp. 193-218.

Docquier, F., Lowell, B. L. and Marfouk, A. (2009) "A Gendered Assessment of Highly Skilled Migration" *Population and Development Review*, 35, pp. 297-321.

Docquier, F. and Marfouk, A. (2006), "International Migration by Education Attainment in 1990-2000," in Ç. Özden and M. Schiff (eds.), *International Migration, Remittances and the Brain Drain*, Washington DC: World Bank.

Docquier, F. and Rapoport, H. (2009), "Skilled Migration: The Perspective of Developing Countries," in J. Bhagwati and G. Hanson (eds.), *Skilled Migration: Prospect, Problems and Policy*, New York: Russell Sage Foundation.

Dumont, J-C. and Lemaître (2004), "Counting Immigrants and Expatriates in OECD Countries: A New Perspective," in OECD, *Trends in International Migration*, Paris, OECD.

Egger, P. and Radulescu, D. M. (2009), "The Influence of Labour Taxes on the Migration of Skilled Workers," *World Economy*, 32, pp. 1365-1379.

Feliciano, C. (2005), "Educational Selectivity in U.S. Immigration: How do Immigrants Compare to Those Left Behind?" *Demography*, 42, pp. 131-152.

Fernández-Huertas Moraga, J. F. (2010), "New Evidence on Emigrant Selection,"

Review of Economics and Statistics, (forthcoming).

Grogger, J. and Hanson, G. H. (2008), "Income Maximisation and the Selection and Sorting of International Migrants," NBER Working Paper No.13821, Cambridge Mass: NBER.

Leibig, T. and Sousa-Posa, A. (2004), "Migration, Self-Selection and Income Inequality: An International Analysis," *Kyklos*, 75, pp. 125-145.

McKenzie, D. and Rapoport, H. (2010), Self-Selection Patterns in Mexico-US Migration: The Role of Migration Networks," *Review of Economics and Statistics* (forthcoming).

Munshi, K. (2003), "Networks in the Modern Economy: Mexican Migrants in the US Labor Market," *Quarterly Journal of Economics,* 118, pp. 549-599.

Nguyen-Hong, D. (2000), "Restrictions on Trade in Professional Services," Productivity Commission Staff Research Paper, Canberra: Australian Government Productivity Commission.

Orrenius, P. M. and Zavodny, M. (2005), "Self-Selection among Undocumented Immigrants from Mexico," *Journal of Development Economics,* 78, pp. 215-240.

Özden, Ç. and Schiff, M. (eds.) (2006), *International Migration, Remittances, and the Brain Drain,* New York: Palgrave Macmillan and World Bank.

Pedersen, P. J., Pytlikova, M. and Smith, N. (2008), "Selection and Network Effects—Migration flows into OECD Countries, 1990-2000," *European Economic Review*, 52, pp. 1160–1186.

Ramos, F. A. (1992), "Out-Migration and Return Migration of Puerto Ricans," in G. J. Borjas and R. B. Freeman (eds.), *Immigration and the Workforce: Economic*

Consequences for the United for the United States and Source Areas, Chicago: University of Chicago Press.

Roy, A. D. (1951), "Some Thoughts on the Distribution of Earnings," *Oxford Economic Papers,* 3, pp. 135-146.

Rosenzweig, M. R. (2010), "Global Wage Inequality and the International Flow of Migrants," in R. Kanbur and M. Spence (eds.), *Equity and Growth in a Globalizing World,* Washington DC: World Bank.

Sabirianova Peter, K., Buttrick, S. and Duncan, D. (2009), "Global Reform of Personal Income Taxation, 1981-2005: Evidence from 189 Countries," IZA Discussion Paper 4228, Bonn: IZA.

Van Dalen, H. P., Groenewold, G. and Schoorl, J. J. (2005), "Out of Africa: What Drives the Pressure to Emigrate?" *Journal of Population Economics*, 18, pp. 741-778.

Table 1: Immigration to the OECD

Host Country	Code	(1) Percent of OECD Migrant Stock	(2) Percent Foreign-born	(3) Percent of Foreign-born Hi-Educated	(4) Weighted Source Country Hi-Educated
Australia	AUS	7.0	32.8	40.3	12.9
Austria	AUT	1.4	14.1	12.7	14.2
Belgium	BEL	1.6	12.6	19.8	13.7
Canada	CAN	7.9	22.4	58.8	13.7
Switzerland	CHE	2.6	29.7	11.5	11.8
Czech Republic	CZE	0.7	5.8	17.3	12.5
Germany	DEU	8.0	7.8	23.8	12.2
Denmark	DNK	0.4	6.1	16.4	14.5
Spain	ESP	2.7	5.5	21.8	14.8
Finland	FIN	0.2	2.5	15.0	17.7
France	FRA	6.3	9.2	11.6	9.4
United Kingdom	GBR	6.0	8.7	31.4	12.5
Greece	GRC	0.7	5.6	41.1	14.9
Hungary	HUN	0.2	1.5	15.4	7.6
Iceland		0.0	12.2	28.1	19.0
Ireland	IRL	0.5	12.1	38.1	18.3
Italy	ITA	1.6	2.2	21.7	12.3
Japan	JPN	1.6	1.0	44.9	17.7
South Korea	KOR	0.2	0.4	22.0	12.5
Luxembourg	LUX	0.2	33.2	40.9	16.1
Mexico	MEX	0.3	0.4	28.7	28.5
Netherlands	NLD	3.1	16.1	14.0	13.2
Norway	NOR	0.4	7.3	18.6	17.2
New Zealand	NZL	0.9	21.9	15.2	15.7
Poland	POL	1.3	3.0	18.5	18.5
Portugal	PRT	0.3	2.1	25.7	9.8
Slovak Republic	SVK	0.1	1.1	18.6	5.4
Sweden	SWE	1.3	12.3	21.5	16.8
Turkey	TUR	1.2	2.1	34.9	18.3
United States	USA	41.6	13.3	42.7	13.2

Notes: Data underlying Docquier, et al. (2009) accessed at http://perso.uclouvain.be/frederic.docquier/oxlight.htm. The figures relate to population aged 25 and above.

Table 2: Migrants to the OECD by Region of Origin

World Region	(1) Percent of Total Migrants to OECD	(2) Percent of Hi-Ed Migrants to OECD	(3) Percent of Migrants High-Educated	(4) Percent of Source Popn High-Educated
North America	2.7	4.7	61.9	51.3
Central America	14.2	7.0	17.6	11.2
Caribbean	5.2	5.6	38.2	9.3
South America	5.0	5.7	39.8	12.3
Scandinavia	1.3	1.3	37.1	24.7
UK and Ireland	6.4	8.4	46.5	17.9
Western Europe	8.2	9.2	39.6	23.4
Southern Europe	8.9	4.3	17.4	10.4
Eastern Europe	9.8	7.7	28.0	12.2
Fmr Soviet Union	3.0	3.3	39.9	18.8
East Asia	7.2	11.0	54.6	5.7
South Asia	7.5	10.5	49.3	8.3
Middle East	5.2	7.6	51.6	4.3
North Africa	6.3	4.8	27.5	9.5
Sub-Saharan Africa	7.9	7.0	31.5	3.9
Pacific Islands	0.4	0.4	36.1	5.6
Australia and NZ	1.0	1.4	51.9	32.6

Notes: Data underlying Docquier et al. (2009) accessed at: http://perso.uclouvain.be/frederic.docquier/oxlight.htm. The figures relate to population aged 25 and above.

Table 3: Determinants of skill selection
Dependent variable: Log high/(medium+low) education ratio, migrants to non-migrants.

	(1)	(2)	(3)	(4)
	Relative wage gap		Absolute wage gap	
Log wage premium differential	-0.087	0.236**		
(destination – source)	(0.071)	(0.057)		
Absolute wage differential			0.561**	-0.270**
(destination – source)			(0.089)	(0.077)
Linguistic proximity	0.140**	0.135**	0.165**	0.114*
	(0.015)	(0.012)	(0.147)	(0.012)
Colonial relationship post-1945	-0.126	-0.962**	0.341*	-0.821**
	(0.142)	(0.116)	(0.143)	(0.115)
Log distance (most populated	0.680**	0.340**	0.720**	0.277**
cities, 1,000 km)	(0.040)	(0.035)	(0.039)	(0.036)
Share in poverty		0.008*		0.005
		(0.004)		(0.003)
Log distance × share in poverty		0.009**		0.011**
		(0.002)		(0.002)
Constant	0.046	0.025	-0.434	0.315
	(0.083)	(0.077)	(0.111)	(0.097)
Observations	1137	1067	1137	1067
R-squared	0.430	0.685	0.449	0.682
Country of destination dummies	Yes	Yes	Yes	Yes

Note: Standard errors in parentheses. * significant at 5%; ** significant at 1%. The dependent variable is weighted by the corresponding total number of migrants from the source country to the destination country.

Table 4: Determinants of skill selection – Alternative Specifications
Dependent variable: Log high/(medium+low) education ratio, migrants to non-migrants.

	(1) Men	(2) Women	(3) Education in source country	(4) High vs low education	(5) Gross wage	(6) Gini coefficient for wage diff	(7) Poverty line of $1 per day	(8) GDP instead of poverty
Log wage premium differential	0.357**	0.199*	0.348**	0.224**	0.241**	0.051**	0.262**	0.175**
(destination – source)	(0.063)	(0.061)	(0.064)	(0.072)	(0.058)	(0.003)	(0.054)	(0.063)
Linguistic proximity	0.165**	0.114**	0.161**	0.158**	0.133**	0.070**	0.145**	0.147**
	(0.013)	(0.013)	(0.013)	(0.015)	(0.012)	(0.011)	(0.011)	(0.013)
Colonial relationship post 1945	-0.933**	-1.104**	-1.041**	-1.000**	-0.948**	-0.581**	-0.855**	-1.033**
	(0.124)	(0.122)	(0.126)	(0.142)	(0.114)	(0.106)	(0.110)	(0.126)
Log distance (most populated	0.385**	0.317**	0.408**	0.539**	0.328**	0.338**	0.386**	1.539
cities, 1,000 km)	(0.038)	(0.037)	(0.038)	(0.043)	(0.034)	(0.031)	(0.033)	(0.066)
Share in poverty	-0.002	0.024**	0.008	0.021**	0.008*	0.023**	0.042**	0.038**
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.008)
Log distance × share in poverty	0.013**	0.004*	0.010**	0.005*	0.009**	0.002	0.001	-0.069**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.004)
Constant	-0.106	0.101	-0.651	-0.372	0.073	0.449	-0.127	-0.787
	(0.083)	(0.082)	(0.084)	(0.305)	(0.075)	(0.069)	(0.063)	(0.118)
Observations	1033	1024	1067	1048	1112	953	1067	1137
R-squared	0.670	0.696	0.674	0.673	0.678	0.760	0.697	0.608

Note: Standard errors in parentheses. * significant at 5%; ** significant at 1%. The dependent variable is weighted by the corresponding total number of migrants from the source country to the destination country.

Table 5: The effects of selective immigration policy on skill selection
Dependent variable: Log high/(medium+low) education ratio, migrants to non-migrants.

	(1)	(2)	(3)	(4)
Log wage premium differential	0.233**	0.276**	0.266**	0.271**
(destination – source)	(0.058)	(0.058)	(0.0658	(0.058)
Linguistic proximity	0.147**	0.143**	0.141**	0.122**
	(0.012)	(0.011)	(0.027)	(0.012)
Colonial relationship post 1945	-0.929**	-1.037**	-1.024**	-0.864**
	(0.109)	(0.110)	(0.110)	(0.115)
Log distance (most populated	0.357**	0.363**	0.403**	0.330**
cities, 1,000 km)	(0.028)	(0.029)	(0.034)	(0.038)
Share in poverty	0.007	0.005	0.008*	0.007
	(0.004)	(0.004)	(0.004)	(0.004)
Log distance × share in poverty	0.010**	0.010**	0.009**	0.010**
	(0.0003)	(3.86)	(0.002)	(0.002)
Social expenditure share in	-0.009	-0.024**	-0.028**	-0.032**
GDP	(0.006)	(0.008)	(0.008)	(0.008)
Flexibility		0.132	0.126	0.0057
		(0.068)	(0.067)	(0.069)
Low restrictions on		0.289**	0.266**	0.302**
professionals		(0.052)	(0.053)	(0.053)
EU pair			0.245*	0.254*
			(0.114)	(0.113)
Points system				0.341**
				(0.08)
Constant	0.091	0.296	0.289	0.402
	(0.140)	(0.058)	(0.150)	(0.151)
Observations	1067	1050	1050	1050
R-squared	0.648	0.651	0.658	0.664

Note: Standard errors in parentheses. * significant at 5%; ** significant at 1%. The dependent variable is weighted by the corresponding total number of migrants from the source country to the destination country.

Data Appendix

Migrant skills. The data that we use for immigrants is that constructed by Docquier et al. (2009) and available at: (http://perso.uclouvain.be/frederic.docquier/oxlight.htm). They count the number of foreign-born working-age individuals (age 25 or above) living in an OECD country (in 1990 and 2000), by skill and by gender. The three educational categories: low corresponds to 0 to 8 years of schooling completed, medium to those with secondary education (9 to 12 years of schooling) and high corresponds to those with tertiary education. To obtain immigration rates, we divide these variables by the total number of people born in the source country and belonging to the same education category, also constructed by Docquier et al. (2009). Importantly, the stock of emigrants is added to the denominator.

As part of a robustness check, we apply a correction factor for age of entry proposed by Beine, et al. (2006). Data on age of entry are available from a subset of receiving countries which together represent more than 3/4 of total skilled immigration to the OECD. They used this data and a gravity model (that also includes variables such as per capita GDP, colonial links and linguistic proximity) to estimate the age-of-entry structure of skilled immigration. The correction factor is calculated as the ratio between the variables "Brain drain 22+" and "Brain drain 0", where "Brain drain 0+" is stock of skilled OECD foreign-born adults by country of origin as percent of skilled natives (including emigrants) and "Brain drain 22+" corresponds to the adults who arrived at age 22 or above. Note that this variable is available for each source country, but does not distinguish between destination countries.

Skill premium. We use data from the Occupation Wages around the World database, constructed by Freeman and Oostendorp (2000), available at http://www.nber.org/oww/. The data include standardized wage information for 161 occupations in over 150 countries from 1983 to 2003 and is based on the ILO October Inquiry that asks governments to report annually on wages for a wide range of occupations. The ILO dataset is not directly usable because of the lack of comparability in reported wage formats across countries and over time. Freeman and Oostendorp corrected the data in such a way that wages could be made comparable across occupations, countries and over time.

Given that occupations may differ in their skill requirements across countries, we choose to construct a skill premium measure based on occupations that are highly-skilled (and do require at least some tertiary education) and unskilled occupations, which according to the ILO description "require a minimum of training or no previous experience". We calculate the wages corresponding to each skill level as follows. First, we calculated the median value of the wages available for each year (for each skill level). Second, we computed the average of these median values over the period available. The constructed variable corresponds to the gross wage in dollars for each skill level. It must be noted that there are missing values for certain country/years and we have made special adjustments for Belgium and Japan where too few observations were available.

To calculate the net wages in purchasing power parity, we multiply the gross wages by a factor (1-tax rate) and divide it by the index of purchasing power parity. The tax rate is calculated using the data set constructed by Sabirianova Peter et al. (2009), who computed average and marginal tax rates corresponding to different income levels over the period 1981-2005 and for 189 countries. We apply the average tax rate corresponding to the 25^{th} income percentile for the low-skilled wages and 75^{th} income percentile for the high-skilled wage. The purchasing power parity adjustment is taken from the Penn World Tables for the period between 1981 and 2000.

Language proximity. Values from 1 to 5 calculated from the number of common nodes in the linguistic tree between the closest official languages of pairs of countries (based on the language classification tree of the Ethnologue).

Colonial links. Dummy equal to 1 for pairs sharing a colonial link after 1945. Source : Centre d'Etudes Prospectives et d'Informations Internationales.

Poverty. The proportion of the source country population living on less than $2 per day ($1 in robustness checks) comes from the World Bank's *World Development Indicators* (http://ddp-ext.worldbank.org/ext/DDPQQ/member.do?method=getMembers). This is the average of the (available) yearly values between 1980 and 2000. The imputed poverty measure corresponds to the predicted value of poverty from a linear regression of poverty on the average share of agriculture in GDP over 1980-2000. The share of Agriculture in GDP comes from the World Bank's Development Indicators as well and is the average share for the years 1980-2000.

Distance. Distance in kilometres between capital cities, taken from Centre d'Etudes Prospectives et d'Informations Internationales, at: http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

Gini coefficient: from Deininger and Squire (1996). Average gini coefficient calculated over the period 1980-1996 (for all available years). The data is publicly available at http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20699070~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html.

Employment flexibility. Based on survey responses of business executives where 0 corresponds to the statement "immigration laws prevent the company from hiring foreign employees" and 10 corresponds to the statement "immigration laws do not prevent the company from hiring foreign employees." This is taken from the International Institute of for Management Development, *World Competitiveness Yearbook* (Lausanne: IMD) for the years 1992, 1994, and 1997-2000 and adjusted to zero mean and unit standard deviation.

Low restrictions on professionals. Data is taken from worksheets underlying the study by Nguyen Hong (2000) of restrictions on trade in professional services, covering professionals in engineering, architecture, accountancy and law. The subset of indicators used here are those on policy rules in each sector related to nationality or citizenship requirements, permanent residence, quotas on foreign professionals, accreditation, licensing and business ownership. A weighted average of scores (in the range 0 to 1, higher numbers reflecting more permissive policy) is constructed for each profession, and these are then averaged over the four professions to give a single value for each country.

Social expenditures (% GDP): Average share of social expenditures in the GDP over the period 1980-2000, OECD statistics, www.oecd.org/els/social/expenditure.

Sample selection: The number of bilateral observations that we can use in our analysis limited by missing destination and/or source country data for a number of the variables. For the migration data we have a total of ?? available bilateral observations across ?? destinations and ?? source countries. Our tax adjusted wage differential data covers ?? bilateral pairs across ?? destinations and ?? sources. Among the source countries represented in the migration data we have a measure of poverty for ?? countries, and we have the gini coeffcienint for ?? sources and ?? destinations. Other variables do not impose a constraint on the total number of available observations [Lng Prox??]. The number of observations by destination and source country that underlie our preferred specification (Col. 2, Table 3) is detailed in the following table.

Appendix Table: Destination and source countries used in estimation

Destination	*No of obs*	*Destination*	*No of obs*	*Destination*	*No of obs*
Australia	72	Ireland	35	Poland	17
Austria	37	Italy	71	Portugal	63
Belgium	73	Japan	22	Sweden	40
Canada	72	Luxembourg	67	Turkey	18
Denmark	72	Mexico	40	United Kingdom	73
Finland	65	Netherlands	9	United States	73
Germany	15	New Zealand	64		
Hungary	1	Norway	68	Total	1067
Source	*No of obs*	*Source*	*No of obs*	*Source*	*No of obs*
Algeria	17	Ethiopia	13	Nigeria	16
Angola	13	Finland	17	Norway	17
Argentina	17	Gabon	9	Papua New Guinea	8
Australia	18	Germany	21	Peru	16
Austria	18	Ghana	14	Philippines	17
Bangladesh	16	Guyana	12	Poland	19
Barbados	10	Honduras	12	Portugal	16
Belgium	19	Hungary	18	Rwanda	12
Belize	9	Iceland	16	Senegal	11
Bolivia	15	India	17	Sierra Leone	11
Botswana	10	Ireland	16	Singapore	13
Brazil	17	Italy	20	Sri Lanka	14
Bulgaria	18	Japan	17	Swaziland	10
Burundi	11	Luxembourg	14	Sweden	18
Cambodia	13	Madagascar	11	Thailand	17
Cameroon	10	Malawi	12	Trinidad and Tobago	12
Canada	19	Mali	12	Tunisia	15
Cent. African Rep.	7	Mauritius	24	Turkey	19
Chad	9	Mexico	16	Uganda	13
Chile	15	Mongolia	9	United Kingdom	20
China	20	Mozambique	13	United States	20
Costa Rica	12	Netherlands	19	Uruguay	14
Cyprus	16	New Zealand	16	Zambia	12
Denmark	18	Nicaragua	11		
Dominican Rep.	12	Niger	9	Total	1,067

Figure 1