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The Ties that Bind: Colonies, Culture and Education Among Immigrants

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Abstract There is concern among many policy makers of a dual problem: too many immigrants overall but not enough highly-skilled immigrants. Using recently available data we examine the factors which influence both the quantity and average educational level of immigrants in OECD countries in 1990 and 2000. We find that geographic proximity and former colonial relationships positively influence the overall number of immigrants but are negatively related to immigrants' average educational level. By contrast, variables such as greater economic freedom, more generous asylum policies, and a common language and religion increase both the quantity and educational level of immigrants. More highly educated immigrants also appear to be more concerned with low unemployment rates among high-skilled workers in destination countries than in income differences between the destination and source countries. These results suggest that highlighting cultural similarities of destination countries can be an important feature of programs designed to attract high-skilled immigrants. Government reforms regarding asylum policies and economic regulation may also increase a country's appeal to higher-skilled immigrants.

Keywords: Immigration, colonial, education, language, religion.

JEL Classification: F2, J1, J6

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1. Introduction and Background

The number of people living outside their country of origin has risen significantly in the last two decades, increasing from 155 million in 1990 to an estimated 214 million by 2010 (UN, 2009). The percentage of the foreign-born population in Western European countries is projected to double by mid-century (Coleman, 2008). This dramatic rise in the international movement of people has made immigration a pressing political issue in many countries. This is reflected in elections such as Silvio Berlusconi in Italy and the gains from anti-immigration parties in the 2009 EU parliamentary elections (BBC, 2009). Despite widespread domestic banking problems and the war in Afghanistan, polls in the United Kingdom have ranked immigration as voters' top concern (TNS, 2008). The state of Arizona in the United States recently passed a law requiring police to detain anyone who they "reasonably suspect" may be an illegal immigrant (Archibold, 2010). The accompanying tightening of immigration laws reflects citizens' concerns about the impact of immigrants on unemployment, wages, crime rates and social welfare programs. These concerns are accentuated by the recessions experienced in destination countries. While the discussion is often about how many immigrants are (or should be) entering a country, the root of many people's concern is actually more about the skill level of those entering the country.

Lower skilled immigrants are often seen as more likely to be a drain on public resources and the economy, than the highly skilled. In immigration policy, the issue is one of both *quantity* and *quality*.

Research focusing on explaining the number of immigrants has identified a significant number of "push" and "pull" factors. This includes earnings variables such as wage/income and employment differentials.[1] Variables such as distance and migration stocks/networks have been found to significantly impact the cost of migration (Bauer, Epstein and Gang, 2002; Clark, Hatton and Williamson, 2002; Curran and Rivero-Fuentes, 2003; Mckenzie and Rapoport, 2007; Stampini, Carletto and Davis, 2008). Some models include variables such as inequality in the source country as a "push" factor (Hatton and Williamson, 2002; Liebig and Sousa-Poza, 2004; Quinn, 2006). Recently, models have started including variables which capture special "cultural" relationships between the source and destination country such as having a common language or a former colonial relationship (Mayda, 2005; Pederson, Pytlikova and Smith, 2004). Recent literature has widened the focus to include the educational quality of immigrants.

The "brain drain" literature has focused primarily on whether migration benefits or harms the source and (sometimes destination) countries.[2] While these studies have been done for decades, none has used educational information on international immigration across a large pairing of countries because the data was simply not available. Data most commonly existed for one single source or destination country.[3] These studies have examined factors such as the impact of emigrants on source country labor markets, remittances and development. Several "brain drain" studies have found negative effects of migration on sending countries and some have even proposed taxing emigrants as compensation.[4]

Recently available data on the educational levels of the stock of various source country immigrants in destination countries allows us to analyze both the quantity and quality dimensions of migration. For example, Rosenzweig (2010) compares the impact of cross-country variation in schooling versus skill pricing differentials on global inequality. Our study utilizes the data set by Docquier and Marfouk (2006), which includes information on the educational composition of migrant stocks for the years 1990 and 2000. Only those two years are available in the data set. Marfouk (2008), studies African immigration, including a dummy variable for former colonial relationship and finds this has a positive impact on the educational level of immigrants. In this study, he examines migration among 53 African source countries and 30 OECD destination countries. Our paper builds directly on the work of Marfouk, with some notable differences in sample and focus, as discussed below.

Examining both the size and educational levels of migrant stocks is an important topic as destination countries often prefer highly-skilled immigrants. Considerable research has been done on the potentially detrimental effects of low-skilled immigrants on labor markets and government spending (Borjas 1985, 1994, 1995; Baker and Benjamin, 1994). Research has also focused on what helps to make immigrants successful in a destination country (Chiswick and Miller, 1992; Funkhouser, 2005; Hammarstedt, 2009). There are many examples of government programs intended to promote high-skilled immigration. During the sample timeframe, the United States, Canada, Australia and New Zealand all had selective immigration programs which put aside visas for workers with desirable skills.[5] Similar programs have since been adopted by

the Czech Republic, France, Germany, Ireland, the Netherlands and the United Kingdom (Doomernik et al, 2009). This emphasis on attracting highly-skilled immigrants is perhaps best seen in the new *Blue Card* system in the European Union. Blue Card provides a renewable two-year right to work for highly skilled immigrants with job offers in the European Union (Sebesta, 2009).

This paper contributes to the literature by identifying the determinants of both the size of migration stocks and their average educational level across a large number of country pairs in two time periods, with a special emphasis on colonial relationships. In our analysis, we examine the impact of colonial relationships on migration and then break this relationship down into various sub-components which reflect the depth of this colonial relationship such as common language, common religion and the amount of time spent as a colony. We distinguish between variables which impact the size of migrant stocks and those which impact the educational levels of those stocks, but estimate these equations jointly since many determinants influence both simultaneously. This approach allows us to see how factors such as colonial relationships and proximity (for example) increase the quantity of immigrants but lower the average skill level of those immigrants. On the other hand, a factor such as common language increases both the quantity of immigrants and their average educational level. It is important to note that the focus of our paper is not limited to the number of emigrating high-skilled workers, but applies to the average educational level of all immigrants. Thus, our paper is not a "brain drain" paper as it utilizes data on immigrants of varying educational levels.

The next section outlines our theoretical framework, which is then followed by a discussion of the data set and variables employed. The empirical methodology and results are then discussed. The paper concludes with a discussion on the implications for policy.

2. Modeling Framework

We follow a simple modeling framework similar to that discussed by Marfouk (2008), where immigrants choose to emigrate depending on 'pull' factors from destination countries, 'push' factors from source countries, and explicit and implicit costs incurred by immigrating. Our analysis is focused on understanding the social and demographic nature of the immigration process, so the following model will focus mainly on the destination pull factors affecting the migration decision.

Immigrant *i*'s expected return from migrating to the destination country *d* can be represented as

$$U_d^i = a_d + \sum_{l=1}^{L} a_d^l X_d^{i,l} + \sum_{m=1}^{M} a_d^m X^{i,m} + \sum_{n=1}^{N} a_d^n X_d^n + a_d^H H^i + \varepsilon_d^i \quad . \qquad (1)$$

Expected utility of immigrant *i*, U_d^i, is determined by four basic components. The vector of variables $X_d^{i,l}$ captures the ease with which immigrants may enter the destination country, for instance, through the benefits of colonial ties, reciprocal immigration or labor mobility agreements (such as the Schengen agreement), asylum procedures, or other immigration policies. The vector $X^{i,m}$ represent factors specific to the individual (other than human capital as

captured in H^i) that affect the return to immigration in the destination country, such as religion or language skills. Language skills affect the return to education; knowing a country's language is more important for workers in highly skilled industries. The vector X_d^n is a set of country specific factors that influence the immigrants overall well-being, such as employment opportunities, income potential, or institutional arrangements. H^i captures the amount of human capital the potential immigrant possesses. If a source country has a more highly educated labor force then there is a higher probability that any single immigrant from that country will have a higher H^i. Mayda (2005) suggests the destination returns to immigration a_d^m, a_d^n, and a_d^H should be conditional on the probability of immigrants entering the country as indicated by $X_d^{i,I}$, as not accounting for the conditional probability will overstate the true returns to immigrating. Since we are more concerned with the significance of these factors rather than the magnitude, we include them here and in the empirical model as separate regressors. The coefficients a_d then represent the marginal returns to the immigrant in the destination country for each of the relevant factors. The error term ε_d^i then represents all other unobservable factors which affect the returns to immigration in the destination country.

If immigrant *i* were to remain in the source country *s*, she would earn the expected return U_s^i, where a similar set of factors from equation (1) represent expected returns in the source country:

$$U_s^i = a_s + \sum_{m=1}^{M} a_s^m X^{i,m} + \sum_{n=1}^{N} a_s^n X_s^n + a_s^H H^i + \varepsilon_s^i \quad , \qquad (2)$$

where the vectors $X^{i,m}$, X_s^n, H^i, coefficients a_s, and error term ε_s^i have a similar interpretation to the destination country counterpart in equation (1).

The immigrant will incur costs in moving from the source to the destination country, both explicitly and implicitly, in the process of immigration. These costs for immigrant *i* are expressed as:

$$C_{sd}^i = a_C + \sum_{k=1}^{K} a_C^k X_{sd}^k + \sum_{m=1}^{M} a_C^m X^{i,m} + \varepsilon_C^i \quad . \qquad (3)$$

The vector X_{sd}^k represents country-pair specific costs to immigrating, such as distance between countries, whether colonial links exist, or if the two countries share a common language. The variables included in the vector $X^{i,m}$ in some cases may be considered either a cost or benefit, and hence is included in equations (1) – (3). For instance, if immigrants speak a second language which is dominant in the destination country, this could be viewed as a 'negative cost', or a benefit. However, not speaking the local language would clearly be costly to the immigrant.

Thus, the immigrant will choose to immigrate whenever $U_d^i - U_s^i - C_{sd}^i > 0$. This condition forms the basis for the econometric analysis to follow. As the data are from actual immigrants (as opposed to *potential* immigrants), this condition holds for our data sample. Thus, our estimated coefficient vectors should be accordingly interpreted as the returns to (actual) immigration for the relevant factors, which are discussed in greater detail in the next section.

3. Data and Variables

The data set consists of observations on migration stocks between country pairs from two years: 1990 and 2000[6]. Our analysis includes 22 immigrant receiving (destination) countries,[7] and as many as 169 sending (source) countries. The source countries exhibit considerable diversity in terms of development levels, cultural heritage, political, and economic systems. The destination countries are all OECD members. The number of observations in our regressions range from 2,361 to 3,999 (depending on the specification).

There are two main dependent variables of interest in our analysis: the size of migrant stocks between country pairs, and the average educational level of these immigrants. Both of these variables are taken from the Docquier and Marfouk (2006) data set. The size of the stock of migrants from source country *s* in destination country *d* is denoted as M_{sd} and is converted to logs in the regressions for scaling purposes. The average educational level of immigrant stocks is denoted as E_{sd} and is measured as the average number of years of schooling of the stock of migrants from source country *s* in destination country *d*.

A major goal of this paper is to examine the impact of cultural ties resulting from former colonial relationships on migration. Previous literature has modeled this through the use of a simple colony dummy variable. We have sought to go beyond this method by including the number of years the relationship existed and specific dummies for language and religious commonalities that result from long-standing colonial ties. Note that including both a colonial dummy and a common language dummy (for example) would be inappropriate because of problems with collinearity. One could imagine other variables reflecting cultural similarities which result from a colonial past (e.g. common educational systems), but unfortunately an appropriate classification system is not available.

Data to construct the colonial variables, the common religion, and language dummies are taken from the CIA World Factbook (2009). If both the source and destination country share one of the same official languages, the common language value equals 1. To construct the common religion dummy, we determined the percentage of the population adhering to one of four major faiths - Christian, Muslim, Hindu and Buddhist. If more than 50% of the population adheres to a particular religion, it is declared a majority religion. If both the source and destination country share the same majority religion, the dummy takes on a value equal to 1. Finally, length of the colonial relationship is defined as the year of independence minus the year of initial colonization. In addition to the cultural variables there are a number of control variables reflecting various push and pull factors impacting migration.[8] Due to data constraints some of these are only available for the destination (OECD) countries. There are three measures of unemployment used in the regressions, all of which are only available for destination countries. Long term unemployment is taken from the World Bank's online World Development Indicators (*WDI*) database and represents the share of total unemployment that is considered long term (those who have been looking for work for 12 months or longer). The unemployment rates of those with primary and tertiary education are constructed from WDI (2009), OECD (2008), and Docquier and Marfouk (2006). They are defined as the number of unemployed with primary (tertiary) education as a percentage of the primary (tertiary) educated labor force. Wage differentials between destination and source countries are proxied by differences in GDP per capita and come

from WDI (2009), measured in constant 2000 US dollars. The index of economic freedom in the destination country is compiled by the Heritage Foundation (Heritage, 2008). This measure of economic freedom has been used in several economic studies (Bengoa and Sanchez-Robles, 2003; Goel and Nelson, 2005; Johnson, Kaufmann and Zoido-Lobaton, 1998). Distance between country capitals is measured in kilometers and taken from the CEPII database (CEPII, 2009). A dummy variable for the year is included, set equal to 1 for 1990. For the educational level regressions only, we constructed a migrant stock variable based on OECD data (*OECD Trends in International Migration* (OECD, 1997 and 2004). This variable was used in the average educational level regressions to forestall any possible endogeneity issues associated with using the same data set to construct both the educational level dependent variable and the migrant stock covariate.

Two variables are included as policy controls, capturing the openness of the destination countries to immigration. A Schengen agreement dummy, consistent with the work of Grogger and Hanson (2008), equals 1 if the source and destination countries are both signatories of the Schengen agreement (or later convention) on borderless travel during the observation year. Since the signatories were EU countries, this reflects immigration ease within most of the European Union countries.[9] A second variable, measuring the percent of asylum seekers accepted by the destination countries, is taken from the UN Refugee Handbook. It is defined as the total number of accepted asylum applications over the range 1990-1999 divided by the total number of applications over that year range.[10]

Descriptive statistics for the variables of interest are provided in Table 1 below.

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Migrant Stock (D&M) ('000s)	11.37	96.76	0.00	6,374.83
Average Education Level (years)	11.64	2.10	6.00	16.00
Dest - Longterm Unemployed Share (%)	32.45	18.28	5.00	70.00
Dest - Primary Educ. Unemployment Rate (%)	7.06	5.52	0.25	23.22
Dest - Tertiary Educ. Unemployment Rate (%)	0.22	0.23	0.04	0.98
Dest - Freedom	69.25	5.88	57.40	80.90
Difference GDP percapita: Dest-Source ('000s)	17.10	11.44	-35.26	46.19
Common Religion Dummy	0.14	0.34	0	1
Common Language Dummy	0.04	0.20	0	1
Schengen Dummy	0.04	0.20	0	1
Colonial Relationship Dummy	0.03	0.17	0	1
Year Dummy (1990=1)	0.50	0.50	0	1
Migrant Stock (OECD) ('000s)	9.87	122.39	0.00	9,336.72
Distance (km)	6,986.85	4,368.46	59.62	19,586.18
Source - Gini	40.30	10.76	19.40	74.33
Source - Population ('000s)	32,400.00	120,000.00	42.03	1,260,000.00
Percent of Asylum Seekers Accepted (%)	0.11	0.10	0.01	0.48
Years As Colony (years)	161.00	125.00	0.00	721.00
Source - Labor Force with Primary Educ. (%)	0.65	0.22	0.06	0.98
Source - Labor Force with Tertiary Educ. (%)	0.09	0.08	0.01	0.51

There are some control variables included that are specific to the source countries. These include variables for inequality (Gini coefficient) and source country population, both taken from WDI (2009). Inclusion of the economic freedom index in the destination country precludes the inclusion of the destination Gini coefficient as this would cause severe multicollinearity. There are also variables for the percent of the source country labor force with primary and tertiary education. This data comes from Docquier and Marfouk (2006).

3.1 Variable Predictions

Cultural similarities between the source and destination country may make immigrant assimilation easier (Levitt, 2003; Ono, 2002). This raises the return to the skills that migrants bring and generates more sizable immigration. An immigrant who speaks the destination country language (for example) will find jobs more plentiful and not be restricted to employment in immigrant enclaves or lower skilled occupations where compensation might be less. We would expect cultural similarities to also have a positive effect on the education level of immigrants, because the return to common language will be greater the more highly educated the immigrant. For example, speaking the language of the destination country is likely to be more important for an office worker than for a housekeeper. In addition, more highly educated migrants are likely to be more influenced by non-economic factors, like cultural similarities. Colonial relationships can also be a strong cultural influence (Burton, 1999; Cooper, 2005; Thompson, 2000). Our basic hypothesis then is that country pairs with colonial relationships, particularly long-lived relationships, tend to be culturally similar in important ways and therefore tend to generate larger and more highly educated immigrant flows resulting in larger and better educated migrant stocks over time. We explore this hypothesis using three regression variants.

Variant 1 is a highly aggregative analysis where we regress separately the migrant stocks and average educational level of the stocks against a colonial dummy variable and a set of control variables. The colonial dummy masks a set of complex underlying cultural similarities, and while the impact on total migration is expected to be positive, the impact on the average educational level is uncertain and requires a more refined analysis. It is important to note that a colonial dummy is not equivalent to a common language dummy, but proxies for a set of similarities like language, religion, legal and educational systems, etc.

A more complex analysis (Variant 2), replaces the colonial dummy with variables targeting two specific cultural similarities – language and religion.[11] Here we would expect to find that positive relationships exist between the common language and common religion dummies and both the size of immigration and the average educational level of immigrants.

Variant 3 focuses exclusively on country pairs with colonial relationships and analyzes the length of the colonial relationship in addition to the common language and religion dummies (again along with other control variables). Since these regressions control for cultural similarities, any additional impact of the length of the colonial relationship must have a different underlying rationale. Our hypothesis is that the longer the colonial relationship, the better information exists regarding the “mother country” and the lower the costs of migration. This should translate into more sizable migration and make it more likely that lower educated individuals would migrate.

Many of the control variables have predictions which are based in well established literatures. The migrant stock variable in the regressions analyzing educational level attempts to capture the network effects of an existing base of migrants in the destination country and should be negatively related to the average educational level of immigrants.[12] The larger the migrant stock in the destination country, the more likely migrant enclaves are to exist, and the easier it is for low-skilled migrants to be absorbed. Network effects have been shown to reduce migration costs in numerous studies including Gorlich and Trebesch (2008), Curran and Rivero-Fuentes (2003), Massey (1990) and Stark (1991). Transportation costs should be negatively related to total migration and positively related to the average educational level since more highly educated individuals have more resources at their disposal, making longer migrations feasible. The source country population variable's coefficient should be positive in regressions where the dependent variable is the migrant stock, since countries with larger populations will tend to send out more immigrants (in absolute terms).

According to neoclassical theories of migration, we would expect real wage differences between destination and source countries to be positively related to migration stocks. Because skill-specific wage data for the sample periods is unavailable, we were forced to proxy average wage levels by GDP per capita in the destination and source countries. While we might find the positive relationship we expect for migration stocks, it is less likely that any significant insight will be gained for the average educational level of migrants, where skill-specific wage differences are most relevant.

We would expect unemployment conditions in the destination country to be important in the decision to migrate. A perception of long-term unemployment in the destination country is most relevant as a determinant of the size of the stock of immigrants, whereas skill/education-specific unemployment rates are more relevant determinants of the skill level of the migrant stock as measured by the average educational level. We expect higher long-term unemployment in the destination country will discourage migration and hence reduce the size of the migrant stock. Long-term unemployment rates may also be a proxy for labor market rigidities which can be important for immigrants seeking employment in the destination country. Higher unemployment rates for those with primary education in the destination country should discourage migration of the low-skilled and hence raise the educational level of migrants (a positive and significant coefficient). Higher unemployment rates for those with tertiary-education should discourage the relatively high skilled and lower the average educational level of migrants (a negative and significant coefficient).

Other control variables include measures of the educational level of the labor force in the source country. We expect the larger the percentage of primary educated workers in the source country labor force, the greater the lower educated migration and hence a reduction in the average educational level of migrants. Similarly, the larger the percentage of tertiary educated workers in the source country labor force, the greater the amount of highly educated and hence an increase in the average educational level of migrants. Greater economic freedom in the destination country should attract better educated migrants, hence increasing the size and average educational level of migrants. Greater inequality in the source country implies a greater incentive to migrate and may lead to more highly educated emigrants (Liebig and Sousa-Poza,

2004). Finally our two policy controls measuring the degree of openness of the destination country should have positive impacts on both the size and educational level of total migrant stocks. The more open the destination country, as measured by either the percent of asylum applications accepted, or a Schengen agreement, the greater and more highly educated are immigrants.

4. Empirical Methodology

It is tempting to treat estimation of the two dependent variables *ln* (M_{sd}) and (E_{sd}) as a simple application of individual equation OLS. All the classical assumptions seem to be met, especially the exogeneity of the regressors, which, while not identical, are similar in the two equations. However there are linkages across the equation that involve the disturbances. Many of the factors that determine the number and average educational level of immigrants are the same and this is likely to be true of any omitted variables that might be part of the error terms. Hence the error terms across the two equations are likely to be correlated and these correlations can provide additional information that should be captured to provide efficient estimates. We therefore estimated the equations jointly using the seemingly unrelated regression (SUR) model.

We applied joint iterative SUR estimation to three variants. Variant 1 used vectors of control variables (***X*** and ***Y***) and a colonial dummy *(CD)* on the entire sample. These control vectors, while similar, were not identical in each equation. Variant 2 used the same vectors of control variables but with common language *(CL*) and religion (*CR*) dummies replacing the aggregative colonial dummy, again using the entire sample. Variant 3 looked only at country pairs that had past colonial ties and added "years as colony" (*YAC*) to the set of variables used in Variant 2.[13]

Variant 1

$$ln\ (M_{sd}) = \beta_0 + \beta_1 CD + \boldsymbol{\beta}_2' \boldsymbol{X}_{sd} + \varepsilon_1 \quad (4a)$$

$$(E_{sd}) = \eta_0 + \eta_1 CD + \boldsymbol{\eta}_2' \boldsymbol{Y}_{sd} + \varepsilon_2 \quad (4b)$$

Variant 2

$$ln\ (M_{sd}) = \gamma_0 + \gamma_1 CL + \gamma_2 CR + \boldsymbol{\gamma}_3' \boldsymbol{X}_{sd} + \upsilon_1 \quad (5a)$$

$$(E_{sd}) = \alpha_0 + \alpha_1 CL + \alpha_2 CR + \boldsymbol{\alpha}_3' \boldsymbol{Y}_{sd} + \upsilon_2 \quad (5b)$$

Variant 3

$$ln\ (M_{sd}) = \delta_0 + \delta_1 CL + \delta_2 CR + \delta_3 YAC + \boldsymbol{\delta}_4' \boldsymbol{X}_{sd} + \omega_1 \quad (6a)$$

$$(E_{sd}) = \phi_0 + \phi_1 CL + \phi_2 CR + \phi_3 YAC + \boldsymbol{\varphi}_3' \boldsymbol{Y}_{sd} + \omega_2 \quad (6b)$$

The Breusch-Pagan test for heteroskedasticity and independence of the equations was calculated for each variant. In each case the null hypothesis of independence was rejected suggesting that the variance/covariance matrix of residuals was not diagonal and therefore that joint estimation was appropriate for efficient estimation. The variance inflation factor (VIF) was used to check for multi-collinearity among the covariates[14].

5. Results

The empirical results are largely consistent with our predictions: factors which lower the cost of migration have a tendency to reduce the educational level of migrants. Results are shown in Tables 2 and 3 below. Examining the impact of cultural similarity on migration we find that a simple colonial dummy shows a positive impact on the number of immigrants from a former colony in the "mother" country, as expected, but a negative impact on the educational level of those immigrants. As stated earlier, however, a single colonial dummy is not sufficient to understand the impact of complex underlying cultural similarities on educational levels, despite the fact that many papers in the literature have tended to use colonial relationship and common language interchangeably. However, introducing common language and common religion variables in place of the colonial dummy leads to interesting results.

Common language, for example, positively impacts the stock of source country migrants in the destination country and the educational level of those migrants, whereas the colonial dummy alone impacted educational level negatively. The common religion variable is also strongly positive and significant in both the educational level and migrant stock regressions. Together these variables suggest that cultural similarity is a strong draw and that more highly educated workers may place more value on cultural similarities than do lower educated workers.

The asylum variable is positive and significant in both the size and educational level regressions. The impact of colonial ties may also vary based on the length of time as a colony. The colonial length variable is positive and significant regarding total number of immigrants but is negative and significant with regards to their educational level. This is as predicted since source countries with longer colonial ties will have more information on the destination country and therefore lower migration costs. Lower migration costs results in more immigrants from the source country, but with a lower average educational level. Similarly, the closer geographically source and destination countries are, the greater the number of immigrants from that source country in the destination country and the lower the educational level.

Greater economic freedom seems to attract both more immigrants and more highly educated ones. Not surprisingly, source countries with higher (lower) educated labor forces tend to have higher (lower) educated emigrants. Also, as predicted, destination countries with higher rates of unemployment among highly educated workers tend to attract less of them. Similarly, higher rates of unemployment among primary educated workers was found to have a positive impact on the educational level of migrants (by attracting fewer less educated workers). High rates of overall long-term unemployment in the destination labor force was unexpectedly positively related to the number of immigrants. This, however, may be an instance of spurious correlation since many destination countries with long-term structural unemployment issues in some labor segments are also magnets for immigrants in other (unskilled) segments. The labor markets that are relevant for immigrants (especially unskilled) may not be the labor markets marked by long-term unemployment, so caution must be exercised in attributing any causal relationship. Source countries with larger populations were found to have a higher number of immigrants abroad. Source country inequality has an unexpectedly negative effect on the size of migrant stocks in the destination country, but appears to have little effect on the educational level of immigrants. Differences in GDP also had mixed results, being insignificant in four out of six regressions.

Table 2. SUR Estimates for Total Number of Source Country Migrants in Destination

Variables	Variant 1 (All Countries)	Variant 2 (All Countries)	Variant 3 (Colonies Only)
Colonial Relationship	3.08	-	-
	(.175)***	-	-
Common Religion	-	0.38	0.50
	-	(.11)***	(.123)***
Common Language	-	1.29	1.65
	-	(.142)***	(.176)***
Years As Colony	-	-	0.003
	-	-	(0.0004)***
Dest. Longterm Unemployment	0.01	0.01	0.02
	(.002)***	(.002)***	(.003)***
Dest. Freedom	0.11	0.10	0.10
	(.006)***	(.007)***	(.008)***
Log(Difference in GDP per capita)	-0.22	-0.09	0.96
	(.087)***	(.091)	(.234)***
Log(Distance)	-0.86	-0.85	-0.90
	(.041)***	(.043)***	(.070)***
Source Gini	-0.03	-0.04	-0.04
	(.004)***	(.004)***	(.005)***
Log(Source Population)	0.79	0.77	0.77
	(.021)***	(.021)***	(.028)***
Percent of Asylum Seekers Accepted	7.26	7.12	6.93
	(.314)***	(.324)***	(.41)***
Year Dummy	-0.22	-0.18	0.06
	(.071)***	(.073)***	(.106)
Schengen	0.28	0.18	-
	(.141)**	(.14)	-
R^2	0.44	0.41	0.40
Number of Observations	3999.00	3999.00	2361.00
Chi-Squared	3275.49	2942.07	1614.43
Significance	0.00	0.00	0.00

Note: Coefficients shown with standard errors in parentheses. *, **, and *** refer to significance at the 10%, 5%, and 1% levels.

Table 3. SUR Estimates for Average Educational Level of Immigrants

Variables	Variant 1 (All Countries)	Variant 2 (All Countries)	Variant 3 (Colonies Only)
Colonial Relationship	-1.16	-	-
	(.155)***	-	-
Common Religion	-	1.06	1.07
	-	(.094)***	(.11)***
Common Language	-	0.32	0.53
	-	(.122)***	(.16)***
Years As Colony	-	-	-0.0008
	-	-	(.0003)**
Dest. Primary Educ. Unemployment Rate	0.06	0.05	0.06
	(.006)***	(.006)***	(.008)***
Dest. Tertiary Educ. Unemployment Rate	-0.88	-0.80	-0.96
	(.16)***	(.16)***	(.23)***
Dest. Freedom	0.13	0.11	0.12
	(.006)***	(.005)***	(.007)***
Log(Difference in GDP per capita)	-0.02	0.08	0.30
	(.086)	(.085)	(.232)
Log(Distance)	0.27	0.29	0.33
	(.037)***	(.037)***	(0.06)***
Log(Migrant Stock)	-0.01	-0.01	-0.01
	(.014)	(.013)	(.018)
Source Gini	0.01	-0.01	0.006
	(.003)***	(.004)	(.004)
Source LF with Primary Educ	-1.28	-1.46	-1.15
	(.22)***	(.22)***	(.351)***
Source LF with Tertiary Educ	2.10	1.09	1.11
	(.53)***	(.53)**	(.87)
Percent of Asylum Seekers Accepted	0.79	0.51	0.90
	(.34)**	(.331)	(.44)**
Year Dummy	-0.41	-0.41	-0.28
	(.11)***	(.106)***	(.14)*
Schengen	-0.17	-0.11	-
	(.12)	(.12)	-
R^2	0.28	0.29	0.32
Number of Observations	3999.00	3999.00	2361.00
Chi-Squared	1689.89	1805.48	1184.40
Significance	0.00	0.00	0.00

Note: Coefficients shown with standard errors in parentheses. *, **, and *** refer to significance at the 10%, 5%, and 1% levels.

6. Conclusion

Many countries have a preference for receiving high versus low-skilled immigrants. Higher skilled immigrants are often perceived as more likely to be employed and less likely to use government services or to cause social problems. The results in this paper address this issue and have implications for both the literature and policy. Our empirical evidence suggests some factors which increase the ease of immigration to a country (such as geographic proximity) may also promote low-skilled immigration.

The results also imply that a colonial relationship is too complex to be modeled by a simple dummy variable, as has been done in the past. This colonial dummy can mask the impacts of factors such as common language and religion versus the length of time spent as a colony. When one moves beyond the colonial dummy variable it becomes apparent that higher educated immigrants appear to place more value on cultural factors such as common language and religion. This suggests that making immigrants feel culturally at home is especially important in attracting high-skilled immigrants.

Another important policy implication is the importance of economic reforms. There is evidence that highly-skilled immigrants are attracted to countries that offer significant economic returns to the highly educated. These are the countries with greater levels of economic freedom. Results also imply that having a more open asylum policy can help draw more highly educated immigrants. Together these results suggest that a destination country wanting to become a magnet for high-skilled immigrants may need to implement significant economic and possibly even cultural reforms. This has especially important implications for the European Union. The EU has been trying to fulfill the Lisbon Agenda of becoming a magnet for highly-skilled, innovative immigrants, while at the same time, individual member countries have resisted economic reforms (such as more open labor markets). Perhaps they must fulfill one goal to achieve the other.

Endnotes

[1] This goes back to the work of Harris and Todaro (1970) and is now common in most migration models. A few examples are Jewell and Molina (2009), Massey et al, (1994) and Stark and Taylor (1991).

[2] There is a long literature on "brain drain" including work such as Beine, Docquier and Rapoport (2007, 2008), Docquier, Lohest and Marfouk (2007), Docquier and Schiff (2009), Le(2008), Chen(2009) , Cattaneo(2009) and Lien and Wang (2005) that examines the educational disparities between emigrants and the native population in LDCs and the impact on sending countries.

[3] For example, see Aydemir and Robinson's (2008) work on immigrants in Canada.

[4] For a discussion of the Bhagwati tax proposal see Bhagwati and Dellalfar (1973), Devoretz and Maki (1975), and Oldmand and Pomp (1975).

[5] Testing the impact of these programs is difficult as including a dummy variable for "selective immigration programs" is nearly identical as testing for English language destination (there is a 0.87 correlation coefficient between the two variables). We tested for this in our sample and found the two variables had virtually identical results.
[6] Only these two years are available in the data set.

[7] The destination countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

[8] Some of these variables were converted to logs for scaling purposes.

[9] Notable exceptions to this agreement are Ireland and the United Kingdom.

[10] Unfortunately, it is not possible to get earlier asylum data for all destination countries.

[11] Note that other cultural similarity variables like educational system and legal system were not possible to generate because of the absence of a suitable classification system.

[12] We ran supplementary regressions treating migrant stocks as a lagged dependent variable in regressions of the total stock (M_{sd}) and found the results to be robust. The R^2 was much higher, as you would expect.

[13] Because the dependent variables cannot assume negative values, it is possible that the estimates are inconsistent. We ran regressions using a Tobit estimation model as a check and discovered that the results were robust. Tobit results are available on request.

[14] VIF statistics were all under 3 when equations were run individually indicating no significant multicollinearity in the regressions.

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