Does Brain Drain Lead to Institutional Gain?*

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Abstract

A country's endowment of human capital can affect its institutions through various channels. This raises the possibility that skilled emigration can leave its mark on a country's institutional development. We combine recent datasets on emigrant stocks and institutional quality to explore the impacts of mobile human capital on home country's institutional quality. Using geography-based instruments for emigrant human capital, we find that larger emigrant human capital stocks (as a share of domestic population) are associated with higher quality of political institutions, but lower quality of economics institutions.

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1. Introduction

How does emigration affect institutional development? Given the emphasis placed on the links between human capital and institutions, the relative neglect of the implications of internationally mobile human capital is surprising. One possible reason for the neglect is the long list of plausible causal channels that could be at work, ranging from the role of emigration as a safety valve for conflict to the loss of scarce institution-building skills. The question is further complicated by the possibility of quite different impacts on political and economic institutions. In this paper, we attempt a first pass at the question by making use of recently available datasets to examine the associations between emigrant stocks and measures of both political and economic institutions, and tentatively exploring whether the observed correlations reflect a causal role for emigration.

The broader question of the role of human capital in institutional development has received considerable attention in theoretical and empirical research. Barro (1999) and Glaeser et al. (2004, 2007) show that institutional outcomes are related to human capital endowments. Acemoglu and Robinson (2005) develop a theory of institutional change in which the *de facto* political power to alter institutions depends in part on the distribution of endowments and efficient institutional outcome depends on the bargaining power of different political interest groups. And at a more micro level, Fukuyama (2004) focuses on the importance of human and social capital in meeting the challenge of providing public services that are both transaction intensive and require discretion by providers (e.g., judges and doctors) to respond to specific circumstances.

Emigration could affect institutional development through various channels. Most obviously, the *absence* of talented individuals could alter both the demand for

productivity-supporting institutions and the supply of institution builders. But there are other mechanisms at work as well. The simple *prospect* of emigration could affect the extent and nature of investments in human capital, or put pressure on governments to deliver the institutions and associated performance valued by potentially mobile individuals. Emigrant *diasporas* could be both a resource to help with building modern institutions, or a source of angry exiles intent on overturning the existing political structures. And finally *returnees* could come back with valuable skills, savings and social connections, or disgruntled and disruptive challengers to the status quo.

We distinguish throughout the paper between the effects of emigration on political and economic institutions, based on a number of theoretical approaches of different vintages to better understand the differential effects. The first is Albert Hirschman's comparison of "exit" and "voice" as mechanisms to influence organization (including state) performance (Hirschman, 1970). We draw on Hirschman's rich treatment of how exit and voice can be both substitutes and complements in bringing about institutional change, and in particular Hirschman's own application his framework to the links between emigration and state reform. The second is Alesina and Spolaore's (2005) work on the number and size of nations. Central to their framework is a trade-off between the disadvantages of heterogeneity across groups with different preferences and the advantages of scale in providing public goods. Although they do not specifically focus on emigration, having an option to leave the country can remove the disaffected, but also reduce the numbers available to spread the fixed costs of national-level institutions. The third is Djankov et al.'s (2003) explanation of institutional outcomes as the chosen points on an Institutional Possibility Frontier (IPF). The frontier shows the

institutional possibilities in the space of disorder (economic institution) and dictatorship (political institution) – i.e. the level of dictatorship required to achieve a given level of order. The position of the frontier is determined by what they call "civic capital." It is easy to imagine skilled emigration affecting the position of the frontier (say by reducing available skills but also by reducing heterogeneity), and possibly also the politics through which the actual point on the frontier is determined.[1]

The overall impact of skilled emigration on any given measure of institutional quality is clearly an empirical question given these many channels of influence. Our goal in this paper is to combine recent Word Bank data on emigrant stocks (Docquier and Marfouk, 2005), the Barro and Lee (2001) measures of domestic human capital and the World Bank governance indicators of institutional quality to explore how emigration affects institutional development. In particular, we estimate the impact of the fraction of adults with tertiary education residing abroad and residing at home in 1990 and 2000, on domestic institutional quality in 2000 and 2010, respectively. We use a ten-year lag because institutions take time to adjust to human capital composition changes. Our results indicate that skilled emigrants have a positive effect on political institutions (i.e., voice and accountability, and political stability and absence of violence) but a negative effect on economic institutions at home (i.e., government effectiveness, regulatory quality, and control of corruption). These results are robust to the inclusion of other known determinants of institutional quality.

[1] It is possible that emigration also alters the balance of political power in a way that affects the chosen point on the IPF – e.g., by improving the "threat point" of highly productive individuals that are disadvantaged by current institutions. Djankov et al. (2003), however, argue that the chosen point on the frontier is determined by social efficiency; i.e. the institutional choice minimizes the combined social costs of disorder and dictatorship. In contrast, Acemoglu and Robinson (2005b) place more emphasis on the political conflicts between vested interests where there are limited opportunities to make credible commitments to compensate those in power for giving up efficiency-reducing privileges.

Needless to say, as with other work using this type of cross-country data, it is difficult to credibly identify the key causal relationships of interest. In our case, the greatest empirical challenge comes from the likely reverse causality from institutional quality to emigration. Put simply, bad institutions are likely to drive good people out. Our main solution is to use geography-based instruments for the emigrant human capital stock in the regressions. Our results show that three simple instrumental variables – whether a country is an island country, a country's land area, and a country's distance to OECD countries – can account for a large fraction of the cross sectional variation in skilled emigration rates. Instrumental variable (IV) regressions yield qualitatively similar results as the ordinary least squares (OLS) regressions.

Although the empirical literature on the impact of emigration on Institutions is limited, there have been a number of recent important contributions. Spilimbergo (2009) shows that foreign-educated individuals foster democracy at home, but only when education is acquired in a democratic foreign country. In a similar framework, Docquier et al. (2011) suggest that skilled emigration can benefit home country's democracy only in the long run. Batista and Vicente (2011) offer experimental evidence that international migration promotes improved institutions by raising the demand for political accountability. Our paper complements these papers in two important ways. First, we use instrumental variable estimation to disentangle the direction of causation. Second, we show that skilled emigration's impact on institutions varies across different dimensions of institutions.

The remainder of the paper is structured as follows. In the next section we provide a simple framework that captures the main channels through which emigration could

affect institutional outcomes. We describe our data in Section 3 and empirical methodology in Section 4. We then present and discuss our results in Section 5. Section 6 concludes.

2. Emigrants and institutions: A Framework

In this section, we outline an eclectic framework for thinking about how skilled emigration affects sending country's political and economic institutions. Given the range of potential effects, we eschew a formal model and instead attempt a broad taxonomy as in Kapur and McHale (2005). Exhibit 1 summarizes this framework. As noted in the introduction, emigration can affect both political and economic institutions through four main channels—absence, prospect, diaspora, and return.

Exhibit 1 Emigrants and Institutions: Possible Causal Channels

Channels	**Effects**	
	Political Institutions	**Economic Institutions**
Absence	Reduces "voice" for reform by removing more productive citizens; may also serve as a "safety valve" for disaffected citizens and thus limit civil unrest	Reduces the supply of individuals capable of designing and staffing key institutional functions; reduces demand for productivity-enhancing institutional reforms
Prospect	The prospect of "exit" can increase the bargaining power of more productive citizens	The prospect of emigration can change the level and mix of human capital investments

Diaspora	"Exiles" can support for opponents to the ruling regime, leading to either institutional concessions or civil unrest	A diaspora with enduring connections can be a source of ideas and resources for economic development and institutional reform
Return	Returning emigrants demand better institutions; returnees might also be a source of destabilizing heterogeneity	Returning emigrants may have acquired capabilities (e.g., running modern hospitals) that are in short supply domestically

Absence Channel

Skilled emigration affects the supply of institutional builders and is a source of demand for better institutions. Considering the supply side first, a useful way of thinking about the provision of key public services is provided by Woolcock and Pritchett (2004) and developed further by Fukuyama (2004). Woolcock and Pritchett distinguish between public services along two dimensions: transactional intensity and the discretion required by the provider. Classroom teaching or judicial rulings are examples transaction-intensive and high discretion activities. In contrast, central banking tends to have low transaction intensity (e.g. interest rates are changed infrequently) but requires considerable discretion, while administering welfare programs will often have high transaction intensity (e.g. frequent checking entitlement to state pensions) but limited discretion. Clearly, devising policies or designing programs require access to specialized skills that could be hollowed out by emigration. However, the greatest institutional challenge typically comes with solving the pervasive agency problems associated with high transaction intensity and

discretion. An effective judiciary requires a well-designed legal system *and* an adequate supply of competent, non-corrupt judges. Emigration is likely to be most damaging when specialized skills are lost.

Skilled individuals are also likely to be an important source of demand for better institutions. In terms of Albert Hirschman's exit-voice dichotomy, skilled emigration (i.e. exit) can remove the demanding residents—the ones with the most to gain from good public services such as protection from theft or corruption. Focusing specifically on the example of emigration, Hirschman (1992, p. 90) views emigration to be depriving the "geographic unit that is left behind . . . of many of its more activist residents, including potential leaders, reformers or revolutionaries," and thus "weakens voice and thus reduces the prospects for advance, reform, or revolution in the unit that is being left."

Emigration can also be a "safety valve" for institutional harmful political conflicts. Quoting Hirschman again (1978, p. 102): "With exit available as an outlet for the disaffected, they were less likely to resort to voice: the ships carrying the migrants contained many actual or potential anarchists and socialist, reformers and revolutionaries."

While the emigration safety valve might allow a society to blow off steam, it might also relieve pressure for democratic reform. Hirschman raises the intriguing possibility that emigration might create space for a more peaceful democratic transition, pointing as possible beneficiaries the Greece, Portugal and Spain in the 1960s and 1970s. Each experienced large-scale emigration, which may have made it easier to "negotiate the difficult passage to a democratic order than would have been the case otherwise" (Hirschman, 1978, p. 103). In our later statistical analysis, we separately explore the

relationship between emigrant human capital and measures of both political stability and democratic voice and accountability.

Prospect Channel

While absent voices can undermine reform, the prospect of exit through emigration can also strengthen the political voice of productive members of society.

In Acemoglu and Robinson's (2005) framework, the exit option can create *de facto* political power by increasing the bargaining power of the productive vis-à-vis powerful ruling elites. The possibility that rulers are forced to provide better services to productive members of society as a means of averting their exit has clear antecedents in the work of North (1990).

Two historical incidents may illustrate different responses to the prospect of emigration. East Germany in the 1950s experienced a flood of (illegal) emigration toward West Germany. At first, the East Germany power holders thought it advantageous to be rid of disgruntled and irreconcilable "class enemies"; but soon, the flow of people among them many highly skilled members of the labor force was so large that the authorities simply closed its frontier by building the Berlin Wall in 1961 to stop the outflow. After they had substantially reduced exit by building the Wall, the authorities realized that they could weaken internal opposition by a selective policy of either permitting certain people to exit or outright expelling critical voices considered to be dangerous or obnoxious, besides, they resorted to overt acts of heightened domestic repression to consolidate dictation.

In the 1950s, Irish emigrants from rural districts surged and reached the highest level in a century. This outflow aroused deep concern and became an important public and political issue that led to a decisive turn in economic policy. The increasing concerns that "Ireland was a dying country . . . led to calls for new economic policies, the adoption of various plans by the different political parties, the appearance of emigration as an issue in a parliamentary election for the first time, and finally the unopposed acceptance (in 1958) of a national economic plan designed to develop Ireland and prevent emigration."[2]

In East Germany's case, initial emigration help stabilize its political environment but later massive emigration began to deplete its institutional builders. The authorities responded through drastic measures to prevent its institutions from falling apart. In the case Ireland, mass emigration initiated a series of reforms that further restored and strengthen its institutions.

Having a prospect of emigrating can also change the expected return to investing in different forms of human capital. Recent work has emphasized the possibility of "brain gain" through this channel. The central idea is that a greater prospect of emigration increases the expected return to human capital investment. Assuming that some of the individuals who are induced to make greater investments end up staying, it is possible that easier access to emigration could end up increasing the country's stock remaining human capital. The possibility of such an investment induced "brain gain" has been a major focus on the recent theoretical literature on migration and development (e.g. Stark et al., 1997; Mountford, 1997; and Beine et al., 2001; Docquier, and Rapoport, 2012).[3] More recently, the possibility of an overall positive effect on domestic human capital has

[2] Please refer to Hirschman (1981) for a detailed discussion of this incident.
[3] See Commander et al. (2004) and Schiff (2005) for critical reviews of the brain gain hypothesis.

received qualified empirical support. Beine et al. (2008) find that countries with low levels of human capital and low emigration rates experience a "beneficial brain drain," but that more countries are net losers than net gainers.

In the context of institutional reform, however, a more important effect may be in how the *mix* of human capital investments is changed. With a strong prospect of emigration, young people will be induced to invest in skills that are internationally marketable. This is likely to make them shy away from investments in skills relevant to public sector institutions, which are likely to be less transferable between countries. For example, the skills developed as a university administrator in India may be considered to be of little relevance to university administration in the United States. In contrast, software development skills are likely to have high international transferability. Thus even the prospect of emigration can help thin a country's supply of talented institution builders.

Diaspora channel

The diaspora channel captures how absent nationals can influence domestic institutions. Many emigrants retain connections—not the least of which is citizenship—with their former homes. These enduring connections lead to an increased willingness to trade, invest, remit, share information and participate in domestic politics. With advances in transportation and communications technology, these connections are typically much stronger than in the past. The expanding permissibility of dual nationality has also facilitated enduring connections. Many skilled emigrants are now truly what Huntington

(2004) refers to (disapprovingly) as ampersands (e.g. Indian & American). These enduring connections help shape sending country's economic and political landscape.

Rauch and Trindade (2002) show that ethnic business and social networks can have a considerable impact on international trade, especially through promoting bilateral trade by providing market information and by supplying matching and referral services. Annalee Saxenian (2006, p. 5) calls the skilled and entrepreneurial immigrants who have strong connections in both home and host regions "the new Argonauts," after the Greeks who sailed with Jason after the Golden Fleece. She argues that they can be a powerful source of economic advantage.

Not all diaspora agitation is beneficial, however. Increasingly, a country's minorities living abroad press their claim to justice not in the country of origin but in the country of settlement. Political turmoil both spurs international migration as well as activates diasporic nationalism. Global trends can weaken the cover of national sovereignty – and diasporic minorities in particular are playing a more activist role in their country of origin, especially where the community faces the threat of violence. "Long distance" nationalism associated with diasporas has often amplified political tensions and conflict in the country of origin. There is also evidence that the problems faced by countries with internal strife are amplified if they have substantial diasporas abroad (Kapur and McHale, 2005).

Return channel

Finally, the return channel captures how returning emigrants can be a force for institutional change. Returnees can be both a source of supply and demand for better

institutions to the extent that they come back with knowledge of better practices and limited patience for older, less effective ways of doing things. Examples of such sort abound, especially in emerging economies.

Central to the return effect is how time spent abroad affects productivity relative to time spent at home. Where an individual spent their past might matter because: (i) there are more opportunities to acquire general capital (skills, savings and social connections) abroad; (ii) there are fewer opportunities to acquire home-country specific capital while abroad; or (iii) simply spending time in developed economies changes expectations and motivations that affect how individuals behave when they return. There are again many case studies of individuals returning to have transformative effects on their home economies. However, as with the diaspora evidence, systematic evidence is less plentiful.

In Latin America, the quality of top-level economic technocrats has grown significantly over the past generation, as a result of their schooling in North America and Europe. They bring with them professional values regarding transparency and accountability that have spillover effects in their countries. A noted example is the Bolivian President Gonzalo Sanchez de Lozada. He was raised and educated in the U.S before returning to Bolivia where he played a key role in stopping hyperinflation in 1985 as the minister of finance. In an interview by Public Broadcasting Service (PBS) in 2001, when asked "what did your time living abroad teach you", he commented: "It was very positive because I knew I received a number-one grade education. And I knew I was very connected to the rest of the world … We had a deep devotion and affection towards Bolivia that had been kept alive in my family… made me a Bolivian patriot, but with a

view through a window onto the world."[4] Other well-known foreign leaders who studied in the US include: Benazir Bhutto (Pakistan), Carlos Salinas de Gortari, Vicente Fox (Mexico), Ehud Barak (Israel), Ma Ying-jeou (Taiwan), Corazon Aquino (Philippines), Hamid Karzai (Afghanistan), and Michelle Bachelet (Chile).

Returning emigrants can also be a destabilizing force. Even if the returnee was not very different from the natives before the original departure, their time abroad might have increased not just their economic potential but also their potential to be disruptive. This "disruptiveness" will often be a source of creative energy for reform, but sometimes insert a new source of conflict-creating heterogeneity. In his classic study of Irish emigration, Arnold Schrier (1958 [1997]), describes the phenomenon of the "returned yank" – often someone who has only been away for a few years – but fits uneasily back in their home society. The possibility for conflict between natives and returnees is dramatized in John B Keane's play *The Field*. In the movie adaptation, which earned an Oscar nomination for Richard Harris' portrayal of an Irish farmer obsessed by land, a returned Irish-American attempts to out-bid the native farmer for a field. The returnee has big plans for hydro-electric power and a mine. But this conflict between native and returnee ends in murder and a community turned upside down.

In sum, we show that skilled emigrants can affect their home country's institutional development through various channels and induce different institutional changes. We take this question to data in the following sections.

4. Data

[4] Commanding Heights: Gonzalo Sanchez de Lozada, from http://www.pbs.org/wgbh/commandingheights/shared/minitextlo/int_gonzalodelozada.html

4.1 Domestic and foreign human capital stocks

Previous attempts to analyze the relations between institution and skilled human capital emigration have been hampered by the lack of consistent and large-scale data. Docquier and Marfouk (2005) have assembled survey and census data on immigrants' educational attainment and country of origin for all OECD countries. Using these data, they provide new estimates of emigration stocks by educational attainment (primary education: 0-8 years of schooling; secondary education: 9-12 years of schooling, and tertiary education: 13 year or more schooling) for 171 and 195 origin countries in 1990 and 2000, respectively. We use these data to construct our two human capital variables. *Domestic human capital* is the share of adult residents (aged 25 and above) with tertiary education residing domestically out of the entire domestic adult population. *Emigrant human capital* is the share of adult (aged 25 and above) residents with tertiary education residing in an OECD country out of the entire domestic adult population.

4.2 Institutional Quality

Our measures of institutional quality mainly come from the World Bank governance indicators assembled by Kaufman, Kraay and Mastruzzi (2010). These indicators measure six dimensions of institutions: Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL) and Control of Corruption (CC). The data covers up to 212 countries and territories between 1996 and 2010. These governance indicators are widely used by economists and political scientists to measure institutions. Many researchers tend to select one (often rule of law) dimension to proxy for

institutional quality.[5] We opt to look at all six dimensions of institutions to provide a complete view of institutions.

We briefly describe the six dimensions of institutions. VA measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and free media. PS looks at the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism. RL measures the extent to which agents have confidence in and abide by the rules of society. These three dimensions, especially the first two, are more related to a country's political institution. GE focuses on the quality of public and civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. RQ evaluates the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. CC measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. The last three dimensions are more concerned with a country's economic infrastructure and policy implementation, and we regard them as measures of a country's economic institutions. All six variables are standardized within the range from -2.5 to 2.5 (with a few outliers), with bigger number corresponding to a better institutional quality. We choose the year 2000 and 2010 to measure the long term institutional outcomes resulting from foreign human capital in 1990 and 2000. We report some summary statistics for two human capital measures and governance variables in Table 1. In year 1990 across all

[5] See, for example, Glesear et al. (2004) and Rodrik et al. (2002).

countries, 7.4% of the domestic adult population has obtained tertiary education; the number of adults with tertiary education residing in the OECD countries accounts for 2.6% of the domestic adult population. The corresponding numbers for year 2000 are 10.7% and 3.3%. There is substantial heterogeneity among countries in terms of foreign human capital. For example, in Grenada and Guyana, more than 30% of people with tertiary education live abroad in 2000. While the same statistics for Bhutan and Swaziland are less than 0.3%.

Table 1 about here

4.3 Control variables

Economists, sociologists, and political scientists have developed many theories of institutional development. Each strand of literature tends to focus on one aspect while overlooking others. To prevent the specification from omission of relevant variables, we follow La Porta et al. (1999) and include a country's economic, political, and cultural characteristics as control variables. First, we control for GDP per capita to capture the impact of wealth on institutional possibilities. Second, we use the percentage of Muslim and Catholic population in each country. Other things equal, these two variables have been found to be negatively associated with institutional development. Third, we include dummies for a country's legal origin. Legal origin can determine political allocation of power thereby influence the institution development. We use two indicator variables of whether a country's legal origin is common law or civil law.

4. Empirical Methodology

Our estimation strategy is dictated by the availability of the combined data sets. We construct an unbalanced panel by pooling together information on emigration at two points of time – 1990 and 2000. We estimate the effect of predetermined levels of human capital measures on ex-post (10 years later) institutional outcomes controlling the known determinants of institutional outcomes. In other words, we use 2000 and 2010 levels of institutional outcomes as dependent variables. And the explanatory variables are lagged 10 years. Our parsimonious specification is as follows:

$$\text{Institutional Quality}_{T} = \alpha + \beta_1 \text{Domestic human capital}_{T\text{-}10} + \beta_2 \text{Emigrant human capital}_{T\text{-}10} + \text{Control variables}_{T\text{-}10} + \epsilon \quad (1)$$

We estimate the above model using OLS estimation and cluster the standard errors at the country level. The key variables of interest are domestic and emigrant human capital. β_1 can be interpreted as the effect on institutional quality of domestic human capital, and β_2 the effect on institutional quality of emigrant human capital. The difference, β_1–β_2, captures the net gain (loss) of moving an educated individual from home to abroad.

While we report this difference as suggestive of the overall impact of emigration on institutional quality, it is important to bear in mind that the steady-state domestic and emigrant human capital stocks are the result of a complicated dynamic process of (anticipated and actual) emigration and return. However, even this basic specification can capture a number of the more dynamic causal mechanisms discussed in the previous section.

For the prospect channel, we discussed how the prospect of emigration could affect the type of human capital invested in, with those anticipating emigration more likely to choose internationally marketable skills over country-specific institutional knowledge. If we make a reasonable assumption that a larger diaspora is associated a higher ex ante probability of emigration, then, holding the level of domestic human capital constant, part of the coefficient on the emigrant human capital variable could reflect the impact of the prospect of emigration on the appropriateness of investments in domestic human capital stock for the support of domestic institution building.[6]

For the return channel, for a given return rate from the emigrant stock, a larger stock is associated with more (and/or more recent) returnees in the domestic population. Since we control for the size of the domestic human capital stock, the coefficient on the emigrant stock should again pick up the effect of emigration through the return channel on the quality of the steady-state *domestic* human capital stock.[7]

In addition to the challenges of uncovering the various causal channels through which emigration could affect institutions, we also face the usual statistical challenges of uncovering causality using observational data. The most obvious relates to reverse causality and omitted variables. While we argue that emigration can affect institutions, it is also likely that institutions will affect emigration. Moreover, economic and social variables such as the level of income per capita or the degree of ethnic diversity are likely to be correlated with both emigration and institutional quality.

[6] We also note that the prospect of emigration could affect the steady level of domestic human capital. Unfortunately, our specification cannot capture this effect as we level of domestic human capital is directly controlled for in the regression.

[7] Once again care must be taken with this interpretation. Another reason why a country might have a large diaspora is that few of its emigrants return. In this case, the observation of a large diaspora is associated with fewer rather than more returnees in the domestic population.

We use a three-part strategy to attempt to uncover the underlying causal relationships. First, we use lagged values of the domestic and emigrant human capital variables. Our human capital variables are from the year of 1990 and 2000, whereas our institutional measures relate to 2000 and 2010, respectively. Owing the persistence of both institutions and emigration, however, this only goes a small way to allaying concerns of reverse causality. Second, we control a number of variables that have been found to be important determinants of institutional outcomes: GDP per capita, fraction of Muslim and Catholic population and English or French legal origins.

Finally, we use three geography-based instrument variables for the emigrant human capital stock. We argue that a country's geography (e.g. size of land mass, island country, distance to major emigrant destinations) affects its institutional quality only through its effect on the ease of emigration. The first geographical variable we use is the country's land area. As a country becomes bigger, people who intend to migrate can choose to move internally from one place to another. A second variable is a dummy variable that equals one if a country is an island. Residents in island countries are generally very open to migration. A third instrument is the GDP weighted distance to OECD countries. Distance is a crucial factor in shaping emigrants' potential choices of destination. It turns out that these three simple instruments can explain a significant fraction of the total variation of countries' skilled emigrants' stocks. In results not reported here, we use a single instrument of land are to overcome the over-identification problems and the results are virtually unchanged.

5. Results

5.1 OLS results

Tables 2 reports our baseline OLS results. Better domestic human capital stock is associated with better outcomes for all six dimensions of institution, except for political stability. This result confirms the well-established finding that better human capital generally go hand in hand with better institution in the cross section. In contrast, emigrant human capital is positively and statistically significant with VA, PS, and RL, but not related to the remaining three dimensions, GE, RQ, and CC at the conventional significant level. The economic significance of the estimates is considerable. For instance, the point estimate of emigrant human capital for VA of 3.127 implies that a 10 percentage points increase in emigrant human capital would increase the VA score by about 0.32, which would in turn increase the country's VA ranking in the world from 50^{th} percentile to 57^{th} percentile.

We performance the T test for the difference between coefficients on domestic and emigrant human capital and report the results at the bottom of the table. As one can see, the benefits of having educated adults abroad significantly outweigh the benefits of having educated adults home, for VA and PS, while the contrary is true for GE and RQ. From the definitions and description above, VA and PS are more closely related to a country's political institutions and GE and RQ more in line with economic institutions. These results suggest that skilled emigrants' effects on home country's institutions are twofold: good for political institutions but bad for economic institutions. The result on GDP per capita is consistent with expectation as higher GDP per capita is associated with better ex-post institutional outcomes.

Table 3 reports the regression results with additional control variables. Our baseline results on domestic and emigrant human capital remain mostly unchanged after controlling for these variables. Emigrant human capital has positive impact on political institutions, but negative effect on economic institutions. Different from the results in Table 2, the net effect of moving domestic human capital abroad, as shown by the difference between domestic and emigrant human capital, however, becomes negligible, for the voice and accountability measure. The net effect of moving domestic human capital abroad continue to be negative for all three dimensions of economic institutions, GE, RQ, and CC.

Countries with greater Muslim population generally have inferior institutional qualities. Other control variables, % Catholic population, civil and common legal origins, do not affect institutions in a significant and consistent manner. The results on GDP per capita are very similar to those in Table 2.

Table 3 about Here

5.2 IV results

The OLS results provide a useful summary of the basic associations between human capital stocks and emigrant quality. But as emphasized already, great care must be taken in giving these findings a causal interpretation. To tentatively explore the possibility of emigration affecting institutional quality, we employ geography-based instruments. Geography gives us a plausibly exogenous source of variation in the emigrant human capital stock. Nevertheless, these geography-based instruments are not without their problems. An important caveat is that geographical features could also affect the institutional quality through the channel of international trade and economic growth, as

shown in the classical gravity models. Our remedy is to include GDP per capita as a control variable in our second stage regression.

Our first-stage regression includes the three geographical variables as discussed above: the logarithm of a country's land mass, a dummy variable for an island country, and the GDP weighted distance to original 20 OECD countries. [8]

Table 4 reports the first-stage results where we include but do not report the excluded variables. The coefficients on three instruments are statistically significant at 1 percent level. Other things equal, an island country has about 4.7 percentage points more residents with tertiary education living abroad than a non-island country. Bigger countries and countries far away from OECD countries have less emigrant human capital. The high first-stage F statistic over 83 indicates a strong first stage regression. [9] In Figure 1, the fitted line indicates a tight correlation between he fitted values and the actual values of emigrant human capital.

Table 4 about Here

Tables 5 and 6 report the results from the IV regressions. The two tables bear a strong resemblance to each other and the instrumental variable results are broadly consistent with the OLS results. Emigrant human capital is positively associated with political institutions, but inversely associated with measures of economic institutions. The magnitudes of the coefficients on emigrant human capital for the political institutions are generally larger than in the corresponding OLS regressions. This difference may be due

[8] These 20 OECD countries include United States, Canada, Australia, New Zealand, Great Britain, France, Germany, Spain, Norway, Finland, Sweden, Switzerland, Austria, Portugal, Italy, Luxemburg, Greece, Ireland, Turkey, and Iceland.

[9] Stock, Wright, and Yogo (2002) recommend a rule of thumb threshold value of 10 for the F-statistic to be confident that the instruments retain their validity.

to the fact that reverse causality mitigates the effect estimates of emigrant human capital on institutions.

We use Sargan test of the overidentifying (over-ID) restrictions, which assesses whether the geographical instruments influencing emigration can be excluded from the second stage regression. Under the joint null hypothesis that the excluded instruments are valid, i.e., uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation, the Sargan test statistic is distributed $\chi 2$ in the number of over-ID restrictions. Failure to reject the null hypothesis implies a failure to reject the "validity" of the instruments. In the tables we provide the p-value of the test of the over-ID restrictions. In most cases, the Sargan statistic fails to reject the null hypothesis, suggesting that the three instruments are valid.

Table 5 and 6 Here

5.3 Robustness Checks

To check whether these findings, especially the positive effects of emigrant human capital on political institutions are robust to other measures of institutional quality, we use a country's polity score, democracy score and executive constraint score from another commonly-used institutional data source – the Polity IV Project (Jaggers and Marshall, 2010). We focus on a country "Polity", "democracy", and "executive constraint". These variables capture the extent of "institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities" as well as the extent to which "the presence of institutions and procedures through which citizens can express effective preference about alternative policies and leaders, the existence of institutional constraints of the exercise of power by the executive, and the guarantee of

civil liberties to all citizens in their daily lives and in acts of political participation." Compared with the governance indicators, these three variables intend to capture more fundamental features of a country's political institution.

We re-estimate Equation (1) using these three dependent variables and report the OLS and IV regression results in Table 7. In fact, OLS and IV estimations yield similar pattern of results. These results confirm our earlier findings that emigrant human capital is positively associated with measures of political institutions. Although the magnitude of the coefficients on emigrant human capital is greater than that of the domestic human capital, the differences between domestic human and emigrant human capital is not statistically significant at a conventional level.

Insert Table 7 Here

6. Conclusions

Recent work on economic growth and development has highlighted the importance of the determinants of a country's institutions. Going back to the pioneering work of Albert Hirschman and Douglas North, international mobility has been hypothesized as a potential determinant of institutions through a range of mechanisms. However, the link between emigration and institutions has received surprisingly little attention. In this paper, we intend to fill this gap. We outline a range of channels through which internationally mobile human capital could influence domestic institutional development. We also lay out a simple empirical framework for examining the effects of emigrant human capital on institutional development, and more tentatively the overall impact of having educated individuals abroad rather than at home.

Our findings consistently show that emigrant human capital have positive effects on home country's political institutions, but negative effects on economic institutions. Moreover, we attribute the association to be causal as we use geography-based instruments for emigrant human capital. Finding better instruments and disentangling detailed mechanisms remain fruitful areas for future work.

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Table 1 Summary statistics for key variables

This table reports number of observations, mean, and standard deviations of key variables of interest. The sample is an unbalanced panel of countries in 1990s and 2000s. Domestic (foreign) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Voice and Accountability (VA), Political Stability and Absence of Violence (PS), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL), and Control of Corruption (CC) are six dimensions of governance recorded at 2000 and 2010. The six indicators are compiled by the World Bank's Worldwide Governance Indicators project.

	N	Mean	SD	Min	Max
Domestic human capital	366	0.091	0.083	0.001	0.515
Emigrant human capital	366	0.030	0.061	0.000	0.475
Voice & Accountability (VA)	414	-0.012	1.003	-2.191	1.763
Political Stability (PS)	403	-0.040	1.000	-3.113	1.665
Government Effectiveness (GE)	413	-0.014	0.998	-2.441	1.970
Regulatory Quality (RQ)	406	-0.010	1.003	-2.325	2.245
Rule of Law (RL)	406	-0.011	1.001	-2.524	2.120
Control of Corruption (CC)	406	-0.009	1.003	-1.914	2.586

Table 2 Effects of domestic and emigrant human capital on institutions

This table reports results of the OLS estimates of the effects of a country's domestic and foreign human capital stocks on its subsequent institutional quality. Domestic (emigrant) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Standard errors are clustered at the country level. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	(1) VA	(2) PS	(3) RL	(4) GE	(5) RQ	(6) CC
Domestic human capital	1.408**	-0.777	0.964**	1.697***	1.841***	1.209**
	(0.552)	(0.524)	(0.421)	(0.435)	(0.462)	(0.533)
Emigrant human capital	3.127***	1.866***	1.039**	0.440	0.181	0.725*
	(0.482)	(0.464)	(0.403)	(0.349)	(0.297)	(0.388)
Log(GDP per capita)	0.324***	0.414***	0.447***	0.445***	0.394***	0.455***
	(0.033)	(0.025)	(0.022)	(0.025)	(0.026)	(0.028)
Year=1990	0.176**	0.0700	0.152**	0.176***	0.171***	0.182***
	(0.078)	(0.081)	(0.063)	(0.061)	(0.065)	(0.067)
Observations	351	343	351	347	347	347
Adjusted R^2	0.462	0.463	0.656	0.683	0.602	0.644
Domestics – Foreign	-1.719	-2.643	-0.075	1.257	1.66	0.484
Difference P value	0.006	0.000	0.895	0.010	0.0008	0.424

Table 3 Effects of domestic and emigrant human capital on institutions with additional controls

This table reports results of the OLS estimates of the effects of a country's domestic and foreign human capital stocks on its subsequent institutional quality. Domestic (emigrant) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Additional control variable include the share of population who are Muslims and Catholics, and two dummy variables of whether a country's legal origin is common law or civil law. Standard errors are clustered at the country level. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	(1) VA	(2) PS	(3) RL	(4) GE	(5) RQ	(6) CC
Domestic human capital	1.092**	-1.263**	0.777*	1.287***	1.442***	0.918*
	(0.448)	(0.523)	(0.398)	(0.413)	(0.437)	(0.517)
Emigrant human capital	1.596***	1.418***	0.0922	-0.410	-0.636*	-0.277
	(0.403)	(0.522)	(0.384)	(0.372)	(0.362)	(0.428)
Log(GDP per capita)	0.293***	0.400***	0.451***	0.449***	0.393***	0.465***
	(0.026)	(0.024)	(0.022)	(0.023)	(0.025)	(0.026)
% Muslim population	-0.972***	-0.358**	-0.389***	-0.386***	-0.368***	-0.594***
	(0.140)	(0.153)	(0.106)	(0.113)	(0.124)	(0.120)
% Catholic population	0.126	0.00972	-0.254**	-0.186*	-0.0449	-0.384***
	(0.114)	(0.138)	(0.109)	(0.104)	(0.110)	(0.125)
Common law origin	0.120	-0.203**	0.129*	0.0432	0.0347	0.168*
	(0.104)	(0.101)	(0.078)	(0.078)	(0.092)	(0.087)
Civil law origin	-0.0569	-0.342***	-0.120	-0.165*	-0.149	0.0436
	(0.110)	(0.104)	(0.0899)	(0.0877)	(0.104)	(0.100)
Year=1990	0.140**	0.0930	0.136**	0.147**	0.136**	0.151**
	(0.071)	(0.080)	(0.061)	(0.059)	(0.064)	(0.065)
Observations	345	339	345	343	343	343
Adjusted R^2	0.599	0.500	0.698	0.719	0.634	0.683
Domestic – Foreign	-0.504	-2.681	0.685	1.697	2.078	1.195
Difference P value	0.321	0.0003	0.212	0.0005	0.000	0.059

Table 4 First stage regression results

This table reports the first stage regression results for foreign human capital Instrumental variables include (1) a dummy variable that equals one if a country is an island, (2) logarithm of a country's land area, and (3) the logarithm of a country's weighted average distance to OECD (original 20) countries, where the weights are the country's GDP. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	Emigrant human capital
Island country	0.047***
	(0.008)
Log(Area)	-0.007***
	(0.001)
Log(Distance to OECD countries)	-0.042***
	(0.005)
Excluded variables	Yes
Observations	354
Adjusted R^2	0.416
F statistics	83.17

Graph 1 Scatterplots of fitted vs. actual values of emigrant human capital

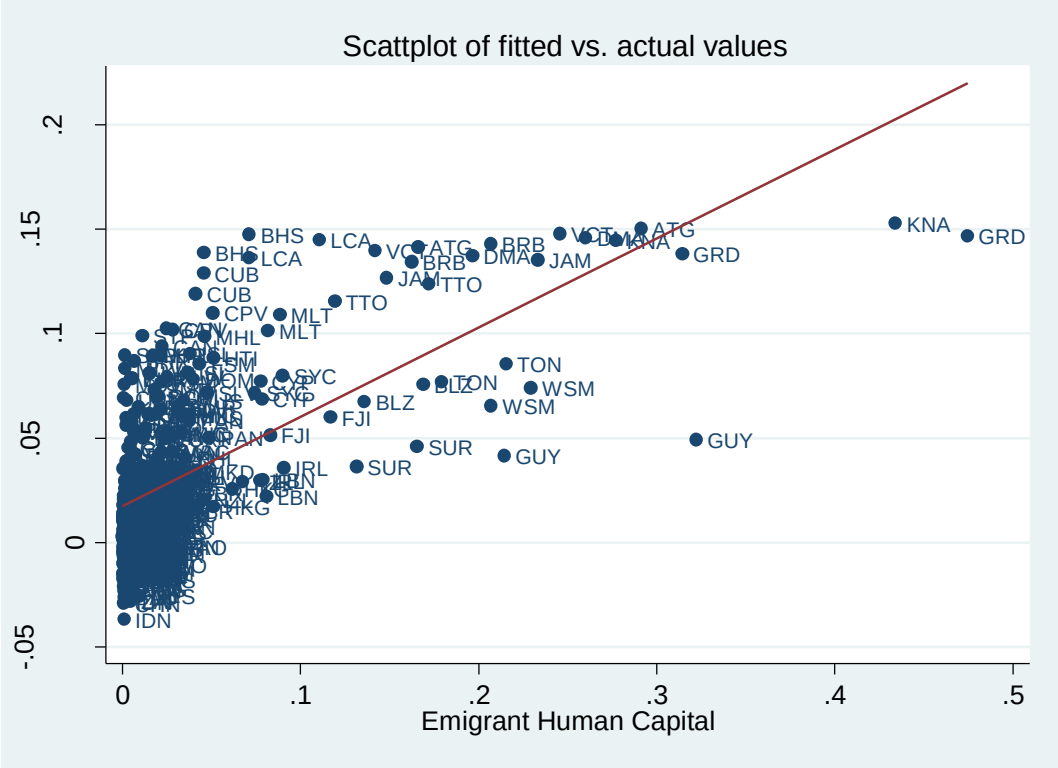

Table 5 Effects of domestic and foreign human capital on institutions: IV estimates

This table reports results of the IV estimates of the effects of a country's domestic and foreign human capital stocks on its subsequent institutional quality. Domestic (foreign) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Standard errors are clustered at the country level. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	(1) VA	(2) PS	(3) RL	(4) GE	(5) RQ	(6) CC
Domestic human capital	2.007***	-0.281	1.149**	1.634***	1.771***	1.373**
	(0.666)	(0.668)	(0.508)	(0.504)	(0.545)	(0.549)
Emigrant human capital	6.306***	5.235***	1.612**	-0.163	-0.312	1.793**
	(1.034)	(1.073)	(0.789)	(0.773)	(0.835)	(0.842)
Log(GDP per capita)	0.283***	0.378***	0.446***	0.450***	0.399***	0.442***
	(0.0352)	(0.0354)	(0.0268)	(0.0268)	(0.0290)	(0.0292)
Year=1990	0.211**	0.123	0.161**	0.165***	0.156**	0.196***
	(0.0834)	(0.0842)	(0.0636)	(0.0627)	(0.0678)	(0.0683)
Observations	345	339	345	343	343	343
Pseudo R^2	0.419	0.417	0.662	0.678	0.598	0.634
Sargan test statistic	0.661	7.008	4.192	1.322	3.191	3.314
Sargan test P-value	0.719	0.031	0.124	0.516	0.203	0.191
Domestic – Foreign	-4.299	-5.516	-0.463	1.797	2.083	-0.42
Difference P value	0.000	0.000	0.579	0.0278	0.0183	0.637

Table 6 Effects of domestic and emigrant human capital on institutions: IV estimates with additional controls

This table reports results of the IV estimates of the effects of a country's domestic and foreign human capital stocks on its subsequent institutional quality. Domestic (emigrant) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Additional control variable include the share of population who are Muslims and Catholics, and two dummy variables of whether a country's legal origin is common law or civil law. Standard errors are clustered at the country level. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	(1) VA	(2) PS	(3) RL	(4) GE	(5) RQ	(6) CC
Domestic human capital	1.418**	-0.908	0.866*	1.234**	1.373**	1.112**
	(0.595)	(0.672)	(0.504)	(0.491)	(0.541)	(0.538)
Emigrant human capital	3.980***	5.054***	0.679	-0.939	-1.137	1.204
	(1.015)	(1.184)	(0.859)	(0.837)	(0.922)	(0.917)
Log(GDP per capita)	0.271***	0.372***	0.451***	0.453***	0.398***	0.450***
	(0.0310)	(0.0349)	(0.0262)	(0.0255)	(0.0281)	(0.0280)
% Muslim population	-0.903***	-0.243	-0.372***	-0.404***	-0.383***	-0.550***
	(0.137)	(0.154)	(0.116)	(0.113)	(0.124)	(0.123)
% Catholic population	0.104	-0.00612	-0.250**	-0.185	-0.0388	-0.399***
	(0.142)	(0.161)	(0.120)	(0.117)	(0.129)	(0.128)
Common law origin	0.0199	-0.377***	0.107	0.0697	0.0558	0.103
	(0.114)	(0.128)	(0.0962)	(0.0937)	(0.103)	(0.103)
Civil law origin	-0.0520	-0.372***	-0.109	-0.159	-0.149	0.0405
	(0.119)	(0.134)	(0.101)	(0.0983)	(0.108)	(0.108)
Year=1990	0.173**	0.147*	0.146**	0.140**	0.129*	0.173***
	(0.0729)	(0.0828)	(0.0616)	(0.0601)	(0.0661)	(0.0658)
Observations	341	336	341	341	341	341
Pseudo R^2	0.572	0.450	0.695	0.713	0.628	0.671
Sargan statistics	1.030	4.872	4.498	0.948	5.120	0.583
Sargan test P-value	0.598	0.088	0.106	0.622	0.077	0.747
Domestic – Foreign	-2.562	-5.962	0.187	2.173	2.510	-0.092
Difference P-value	0.017	0.000	0.836	0.014	0.009	0.925

Table 7 Effects of domestic and emigrant human capital on Polity score

This table reports results of the OLS and IV estimates of the effects of a country's domestic and foreign human capital stocks on its subsequent polity score, democracy, and executive constraints. Domestic (emigrant) human capital is constructed as the share of tertiary-educated adults residing at home (abroad) out of the entire adult population residing at home in 1990 and 2000. Additional control variable include the share of population who are Muslims and Catholics, and two dummy variables of whether a country's legal origin is common law or civil law. Standard errors are clustered at the country level. ***, **, and * indicate statistical significance at 1%, 5%, and 10% level.

	(1)	(2)	(3)	(4)	(5)	(6)
	Polity		Democracy		Executive constraint	
	OLS	IV	OLS	IV	OLS	IV
Domestic human capital	11.55***	12.14**	7.155***	7.611***	3.052**	3.227**
	(3.801)	(4.906)	(2.305)	(2.874)	(1.230)	(1.546)
Emigrant human capital	15.93**	30.15*	9.311**	20.55**	4.163*	8.481
	(6.312)	(17.51)	(4.232)	(10.22)	(2.367)	(5.498)
Log(GDP per capita)	0.488*	0.423	0.570***	0.520***	0.246***	0.227***
	(0.260)	(0.268)	(0.150)	(0.157)	(0.0802)	(0.0847)
% Muslim population	-7.757***	-7.486***	-4.324***	-4.110***	-2.404***	-2.321***
	(1.305)	(1.189)	(0.697)	(0.699)	(0.399)	(0.376)
% Catholic population	1.203	1.236	0.776	0.802	0.274	0.284
	(1.044)	(1.273)	(0.610)	(0.747)	(0.331)	(0.402)
Common law origin	0.451	0.194	0.117	-0.0883	0.0375	-0.0413
	(0.932)	(0.932)	(0.517)	(0.547)	(0.275)	(0.294)
Civil law origin	0.729	0.654	0.134	0.0747	0.00964	-0.0134
	(0.994)	(0.996)	(0.557)	(0.585)	(0.302)	(0.315)
Year=1990	-0.201	-0.0980	-0.0550	0.0227	-0.107	-0.0767
	(0.617)	(0.624)	(0.362)	(0.366)	(0.194)	(0.197)
Observations	285	285	276	276	276	276
Adjusted/Pseudo R^2	0.383	0.377	0.450	0.441	0.407	0.402
Sargan statistics		0.739		0.322		0.411
Sargan test P-value		0.691		0.851		0.814
Domestic – Foreign	-4.38	-18.01	-2.156	-12.94	-1.111	-5.254
Difference P value	0.502	0.302	0.630	0.205	0.652	0.339