Skilled migration and the transfer of institutional norms[1]

by

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Abstract

This paper examines the impact of international emigration on the evolution of the quality of institutions in the origin countries. We allow for two broad channels for the impact on origin country institutions. One relates to the direct and indirect impact of emigration through usual mechanisms like the exit/voice mechanisms. The second broad channel relates to the transfer of norms from the Diaspora to the natives of the origin country. We test those impacts on 4 different indicators of institutional quality using new cross-country data over the 1990-200 period. Our results provide support for an impact of the brain drain on institutions and a strong support for a transfer of norms from the Diaspora. We document the robustness of those main conclusions to the use of alternative econometric methods and to the use of alternative samples involving developed or developing countries.

Keywords : Institutions, international migration, norms, diaspora, brain drain.

JEL Codes : F22, J24, J61, J64.

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1. Introduction

Labor migration is a central feature of the current international economy inducing high attention from both academics and policymakers. The most recent available estimates suggest that by 2000 there were 60 millions migrants (i.e., aged 25 or more) living in the OECD area of which 20 millions are highly skilled migrants (i.e., foreign-born workers with tertiary education). Developing countries are major suppliers of such migration. They accounted for 64.5 percent of total immigrants and 61.6 percent of skilled immigrants in the OECD. This is 15 percentage points higher than in 1990 (Docquier et al., 2007). An intense debate is taking place on the causes and consequences of such a phenomenon. Thanks to the availability of new data sets on migration, a new generation of research is now able to address empirically various aspects of migration. An important part of this literature focuses on skilled migration and brain drain.

The early literature dealing with the brain drain dates back to the 1960s and 1970s and supports the view that skilled migration is unambiguously detrimental for those left behind (See Docquier and Sekkat, 2006; for a more detailed discussion). As a consequence, some authors asked for the implementation of a mechanism of international transfers that compensates the origin countries for the losses incurred (for example, Bhagwati and Hamada 1974). This may take the form of an income 'tax on brains' (known as 'Bhagwati Tax') to be redistributed internationally.

More recently, the literature starts pointing to channels through which the brain drain may positively affect the sending economy. These include a set of "feedback effects" such as remittances, return migration, the creation of business and trade networks, and the effect of migration prospects on education. Remittances often represent a major source of income in developing countries: about $US 150 billion in 2004, roughly the same amount than foreign direct investments and about three times as large as the official development aid (World Bank, 2006). As such, remittances may have a strong impact on poverty and on households' decisions in terms of labor supply, investment and education (Hanson and Woodruff, 2003 and Edwards and Ureta, 2003). Although the magnitude of return

migration is badly known, the fact that migrants accumulate knowledge and financial capital in rich countries before spending the rest of their career in their origin country is also a potential important and positive feedback (Dos Santos and Postel-Vinay, 2003 and Borjas and Bradsberg, 1996). Empirical results confirm that low-skill workers seek to accumulate enough savings and return home as self-employed (Mesnard, 2004; Mesnard and Ravallion, 2001; Dustmann and Kirchkamp, 2002; Ilahi, 1999; Woodruff and Zenteno, 2001 and McCormick and Wahba, 2001). McCormick and Wahba (2001) offer useful insights regarding skilled migrants. They show that the migration duration has a significant positive effect on the probability of entrepreneurship upon return.

Prospects of migration can also induce more people to invest in education at home (Mountford, 1997; Stark et al., 1998; Vidal, 1998 and Beine et al., 2001). Assuming that the probability of migration depends on the educational requirement and that the return to education is higher in developed countries, migration prospects raise the expected return to education and, hence, investment in human capital formation. Since all educated people will not succeed in migrating, some will stay in the origin country. As a result, the stock of human capital in the origin country could be higher with than without prospects of emigration. Empirical evidence (Beine et al., 2001 and 2008) confirms that migration prospects have a positive and significant impact on human capital formation at origin, especially for countries with low initial GDP per capita levels. Finally, the creation of migrants' networks can facilitate the movement of goods, factors, and ideas between the migrants' host and home countries. Ethnic networks help overcoming information problems linked to the nature of the goods exchanged. Rauch and Trindade (2002) have found that ethnic Chinese networks affect trade in differentiated goods. In the same vein, Docquier and Lodigiani (2006) find that skilled migration has a stimulating effect on FDI.

So far, the reported findings deal with the economic impacts of brain drain on the origin country. A very recent strand of the literature is now focusing on the non-economic impacts on the origin country. Such impacts cover a wide range of dimensions including ethnic discrimination (Docquier and Rapoport, 2003), fertility (Beine et al., 2008),

corruption (Mariani, 2007) and democracy (Spilimbergo, 2009 and Docquier et al., 2009).

Docquier and Rapoport (2003) and Mariani (2007) offer a purely theoretical analysis. The former assumes a rent-extraction basis for ethnic discrimination in developing countries. Discrimination takes the form of a financial penalty levied on each educated minority member and equally redistributed among the majority. Such discrimination, therefore, lowers the return to human capital for the minority group and, hence, decreases the number of minority members who invest in education. The authors show that, provided that migration costs are sufficiently low, migration prospects to a discrimination-free country can protect the minority *via* a decrease in the equilibrium domestic level of discrimination. Mariani (2007) showed how the brain drain might reduce corruption in the origin country. Agents have two possibilities of career, acting as rent-seekers or engaging in productive activities. The latter may have the possibility to export their human capital to a rent-free foreign country. Hence, the prospects of migration reduce the relative return to rent-seeking, thus decreasing the fraction of skilled workers who opt for such activities.

On the empirical side, Docquier et al. (2009) investigated the impact of emigration on democracy and civil liberties in the origin country. They found a positive effect of the total emigration rate on democracy and civil liberties. In contrast, a similar positive effect is found only for the share of tertiary educated workers living in the home country. The latter suggests that skilled migration has an ambiguous impact on institutional quality. Counterfactual simulations show, however, that, in general, skilled migration has a positive impact on institutions. Beine et al. (2008) examines the relationship between international migration and source country fertility. More precisely, they examine whether international migration is a channel through which destination countries fertility norms are transferred to the source country fertility. The findings confirm that international migration, indeed, results in a transfer of fertility norms from host to home countries, resulting in a decrease (increase) in home country fertility rates if they are

higher (lower) than host country rates.[2] Spilimbergo (2009) focuses on the impact of foreign-educated individuals on democracy in their home countries. The paper shows that foreign-educated individuals promote democracy in their home country, but only if the foreign education is acquired in democratic countries. This result is in line with Beine et al. (2008) regarding the transfer of fertility norms from the host to the home country via migration.

The present paper contributes to this literature by focusing on the quality of "market friendly" institutions as measured by Kufmann et al (1998). These are among the most widely used measures of the quality of institutions. The relevance of such focus is based on the following findings of the literature. First, there is the primary role of the quality of institutions in shaping economic growth. Second, there is a growing evidence that institutions, or at least a part of them, are not frozen but could be changed and that human capital can play an important role in this respect. Finally, the recent literature supports the existence of feedbacks from emigration to the origin country. These aspects are examined in the Section 2.

On the light of these findings, we address the three following questions: i) What is the impact of international migration on the quality of institutions in the sending country? ii) Is the level of education of emigrants important for such an impact to take place? and iii) Is a change in the quality of institution in the home country depends on their quality in the host country i.e. is there a transfer of norms? The answer to each of these questions has two components: existence or not of an impact and the sign of the impact. The possibility of a positive or a negative feedback of emigration on the home country's institutions depends on these two components. For instance, emigration may have a negative impact if individuals that can effectively voice in favor of an improvement in the quality of institutions tend to leave the country. The impact might be positive if the same individuals rely on the liberal climate in the host country in order to advocate for an improvement in the origin country. In a similar vein, the feedback through the transfer of norms can only be positive if the host country benefits from good quality of institutions.

The rest of the paper is organized as follows. Section 2 discusses the main relevant findings in the literature that motivate the question of the paper. Section 3 presents the econometric methodology, the data, the construction of the various indicators to be used and discusses their main features. Section 4 focuses on the results and Section 5 concludes.

2. Connections to the existing literature

2.1 Institutions and growth

The role of "market friendly" institutions in fostering growth is probably the most robust findings of the new empirics of growth. According to North (1990), institutions consist of formal and informal rules and constraints and their enforcement characteristics. From an economic point of view, institutions aim at organizing and supporting market transactions. The quality of institutions affects growth through its impact on the protection of property rights and transactions costs which affect the incentives faced by private agents.

There is now some extensive empirical evidence supporting the above claim. Some analyses focus directly on growth while others examine the impact of institutions on the determinants of growth. For instance, Rodrik et al. (2004) investigated the impact of institutions on per capita income. Their results supported the primacy of institution as a determinant of growth. Once institutions are controlled for, indicators of geography appear to have a weak direct effect on income while trade indicators are almost always insignificant. Brunetti et al. (1998), Mauro (1995) and Knack and Keefer (1995) examined the impact of the quality of institutions on growth and investment. They found that when such quality is low, growth and investment are low. Schneider and Frey (1985) found that political instability has a negative impact on Foreign Direct Investment (FDI) inflows. Gastanaga et al. (1998) showed that corruption, bureaucratic delays and imperfect contract enforcement are associated with lower FDI to GDP ratios; a result confirmed by Globerman and Shapiro (2002) and Wei (2000). Beside the quantity of investment, other studies focus on its quality. Tanzi and Davoodi (1997) found that while

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corrupt governments tend to invest quantitatively more, they tend to devote lesser resources to the maintenance of past projects, which reduces the quality of public infrastructures. Mauro (1998) showed that higher levels of corruption are associated with larger public investment in unproductive investments. Finally, Kaufmann et al. (1999) observe a significant negative relationship between the deterioration of the quality of governance and human capital. Other studies documented that low quality institutions have negative impact on aggregate productivity (Hall and Jones, 1999), productivity growth (Olson et al., 2000) and international trade (Rodrik, 2000 and Anderson and Marcouiller, 2002). These are definitely dimensions that economists consider as important drivers of economic growth.

2.2 Endogeneity of institutions and Human capital

While the quality of institutions persists, it is not frozen. Many aspects of institutions change frequently. The literature focused first on a major aspect of institutions: Democracy. It tried to identify the determinants of the move from autocracy to democracy putting special emphasis on education and development. Going back to Aristote, Lipset (1959) argued that democracy develops in society where a mass of educated population wisely participates in politics and develop the self-restraints that avoid succumbing to the appeals of irresponsible demagogues. Friedman (1962) emphasized the role of economic openness in fostering democracy. The diffusion of liberal norms and the expansion of the middle class that accompany expansion of trade may exert pressure on autocrats to expand political rights. From this perspective, the gain from "trade in ideas" could be much more important that the one from trade in goods.

The above ideas have been formalized recently by Glaeser et al. (2007) and Acemoglu and Robinson (2006). The former showed that education could foster democracy through socialization and the shaping of group incentives. In Glaeser et al.'s model, democracy is a regime which benefits a large number of citizens while autocracy benefits few supporters. Assuming that education raises the benefits of political participation, more people fight for the more inclusive regimes as human capital increases. The move toward democracy depends, therefore, on the number of educated people. While Glaeser et al.' focused on one aspect of institution (i.e. democracy), Acemoglu and Robinson (2006)

considered a broader set of aspects. They sought to identify those aspects that can evolve, those that persist and the effects on economic outcomes. Their analysis is based on the distinction between two sources of political power: de jure power (allocated by political institutions such as constitutions or electoral systems) and de facto power (emerging from collective action or other channels such as lobbying or bribery). The equilibrium institutions are a result of the incentives and the relative power of the two sources.

The empirical literature reflects the interest of the theory: much of it focused on democracy. The results by Barro (1996) on the determinants of democracy lend support to the possibility of change in institutions. The author focuses specifically on the impact of economic development on a country's propensity to experience democracy. He found that the propensity for democracy rises with per capita GDP, primary schooling, and a smaller gap between male and female primary attainment. Similar conclusion was reached by Glaeser et al. (2004) which show that differences in schooling are a major causal factor explaining not only differences in democracy, but more generally in political institutions. Acemoglu et al. (2005) questioned these findings. Since they are based on cross-sectional analysis, they might be only driven by omitted factors influencing both education and democracy in the long run. Using an unbalanced panel of around 100 countries over the period 1965-2000, they found that the cross-sectional relationship between schooling and democracy disappears when country fixed effects are included in the regression. However, Castelló-Climent (2008) criticized the use of fixed effect strategy. Drawing on Monte Carlo simulations by Hauk and Wacziarg (2009), they argue that when variables are highly persistent and measured with error, the fixed effect estimator, by exploiting the within country variation in the data, may exacerbate the measurement error bias. In this context, using the fixed effect estimator is unadvisable. The authors, therefore, used the system GMM estimator, which reduces the potential biases and imprecision associated with the fixed effects estimator when variables are persistent. Doing so, the results by Barro (1996) and Glaeser et al. (2004) re-emerge confirming the positive impact of education on democracy.

Acemoglu et al. (2005) examined empirically the possibility of change in other aspects of institution. They focused on the rise of Western Europe after 1500. The authors investigated whether the substantial trade with the New World, Africa, and Asia by

countries with access to the Atlantic effected their growth. Two effects are considered: a direct effect through trade itself and an indirect one through institutional change. The empirical analysis is based on a sample, from 1300 to 1850, of Atlantic traders and countries that were not Atlantic traders. The indicator of political institutions measures the limitations on the arbitrary use of power by the executive. It is supposed to reflect the security of property rights. The results strongly support that there were consistent move toward better political institutions in nations engaged in Atlantic trade. The growth of Atlantic trade seems to have strengthened merchant groups by constraining the power of the monarchy, and helped merchants obtain changes in institutions to protect property rights.

2.4 Migration and home country institutions

Casual observation suggests a link between migration and home country institutions. Many governments have actively financed and hosted foreign students with the objective of creating close ties with future ruling classes and spreading specific ideas. For instance, the former Patrice Lumumba University was founded in 1960 with the explicit mandate to prepare future socialist leaders in Africa. In a similar vein, some Islamic countries host and fund foreign Muslim students as a way of forming future leaders in Islamic countries. Beside such observation, there are economic mechanisms by which migration can affect home country institutions.[3]

A first mechanism draws on Hirschman's (1970) "Exit and Voice" model. To illustrate the mechanism, consider a small developing economy where a rent-seeking government is levying a tax on income without productive counterparts. The tax rate can thus be seen as measuring the intensity of corruption or political repression. Individuals have two possible responses to rent-seeking: they can exit or voice. Exit means emigration to a corruption-free country. Voice means protest against rent-seeking through strikes, political demonstrations or even armed conflicts. For simplicity, let's assume that only non exiting individuals voice. From the individual point of view, both options induce costs. Emigration has monetary costs (travel, settlement, finding a new job) and non

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[3] Note, however, that Diasporas don't always have a positive role in the home country. It can, for instance, support dictators, fund civil wars or initiate coup

monetary costs (lost of existing social ties, adaptation to a new culture, set up of new social ties). Voice can lead to imprisonment, torture or even death. The government incurs costs to control voicing but exit reduces the amounts the government can tax. Depending on the various costs, the government might in the equilibrium be incited to reduce that tax rate. In other words, a high degree of exit can reduce the tax base so that the government finds it more profitable to reduce rent-seeking to keep people inside the country even at a higher total cost of controlling voicing.

A second mechanism is based on the removal of the assumption that individuals abroad can not voice. In reality they do and sometimes in a way that can affect home country institutions. They may put pressure on international institutions and foreign states to push their local government to change. Shain and Barth (2003) identified the following active behavior helping the achievement of such objective. Migrants or Diasporas can organize as interest groups in order to influence the foreign policy of their host vis-à-vis their home countries. They can also be active actors, influencing the foreign policies of the home country by achieving economic and political power. Actually, in many democratic countries, members of Diasporas become nationals and, sometimes, highly ranked civil servants or political leaders. Finally, Diasporas can reinforce its influence on host country leaders through, for instance, investments in national projects or political contributions.

Beside exit and voice mechanisms, Diasporas can influence home countries institutions in other ways. They can play the role of transnational transporters of cultures, promote transnational ties, act as bridges or as mediators between their home and host countries, and transmit the values of pluralism and democracy as well as the entrepreneurial spirit and skills to their home countries (see Shain and Barth, 2003 for further analysis). In the introduction, we documented the importance and the role that remittances play in the origin country's economy. Beside their impact on education and investment, remittances might affect the origin country institutions. They can represent resources that strengthen individuals vis-à-vis state actors and encourage them to vote for non ruling parties and hold local leaders accountable (Pérez-Armendáriz and Crow, 2010).

Empirical evidence supports the role of Diasporas in influencing the host country foreign policy. Lahiriy and Raimondos-Miller (2000) reports striking relationship between the

distribution of aid and the ethnic composition of some countries which suggests that Diasporas could influence the distribution of international aid. For example, a large proportion of aid from Germany goes to Turkey. Similar observation can be made for U.K. aid to India and U.S.A aid to Israel. Moreover, Alesina and Dollar (1998) found that the "colony shares" in bilateral aid are high in countries like U.K.: 78%, France: 57%, Portugal: 99.6%, and Belgium: 53.7%. Since, there is a high correlation between ethnic composition of a country and its colonial past (Docquier et al., 2007), one can not exclude that a potential reason for such high proportions of aid could be the ethnic composition of the donor country. Gawande et al. (2006), focusing on the effect of foreign lobbies on the USA trade policy, also lend support to the role of diasporas in influencing the host country foreign policy. Their econometric analysis confirms that foreign lobbying activity has significant impact on the USA trade policy. Tariffs and non-tariff barriers (NTBs) are both found to be negatively related with foreign lobbying activity.

While the above empirical evidence supports that Diasporas can influence the host country foreign policy, it is silent on whether such influence translates in a change of the home country institutions. Although not addressing this question directly, other type of evidence is relevant in our context. Pérez-Armendáriz and Crow (2010) examined how international migration acts as a force of democratic diffusion using the results of a national survey in Mexico conducted in June, 2006. Their findings support the existence of transfer of norms from the host to the home country via migration. They identified three effective channels trough which the transfer operates: i) migrant returns, ii) cross-border communication between migrants and people in the origin country, and iii) migrants networks. Spilimbergo (2009) dealt with a similar issue. Focusing on the impact of foreign-educated individuals on democracy in their home countries, the author found that such individuals, indeed, promote democracy in their home country. Using cross countries data, Docquier et al. (2009) and Beine et al. (2008) investigated the possibility of transfer of other aspects of norms. The former, found a positive effect of the total emigration rate on democracy and civil liberties in the origin country while the latter

showed that international migration results in a transfer of fertility norms from host to migrants' home countries.[4]

3. Methodology, Data and descriptive analysis

3.1 Econometric specification

In order to estimate the impact of migration on institution quality, we need to consider first the econometric specification that best describes the relationship between migration and institutional quality. Obviously, institution quality might be explained by a large set of observable but also unobservable factors. Failure to account for these factors is likely to induce large biases in the way migration affects institutional quality.

Therefore, for a given norm and a given destination we estimate the following dynamic panel data model:

$$\Delta I_{it} = \alpha + \rho I_{it-1} + \theta m_{it-1} + \gamma N_{it-1} + \delta H_{it-1} + \varepsilon_{it} \tag{1}$$

where i refers to origin country, t refers to time.

This specification allows for a catching-up process in institutional quality across countries. This catching up process is related to several phenomena. First, there is a long-run global improvement of institutional quality in developing countries (see Rodrik, 2000). One of the reasons is related to the fall of the Berlin Wall and the gradual adoption by former socialist regimes of Western institutions (Sachs and Warner, 1995). Second, the values of institutional quality being bounded at the bottom and at the top of the world distribution, there is a natural trend for countries to converge towards the mean of the distribution. This is especially the case for countries with very low initial values in terms of institutional quality.

An important feature of this specification is that migration will affect the change in institutional quality and not its level. Since we have two years of the data, this model is equivalent to a panel data model with fixed effects. These fixed effects capture the role of

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[4] The evidence in favor a transfer of fertility norms is also provided by microeconomic findings from Egyptian return migrants by Bertoli and Marchetta (2011).

unobservable country specific factors. Therefore, we minimize the probability of misspecification affecting the results.

In addition to the catching-up process, Equation (1) relates the change in institutional quality to the past values of the emigration rate of origin country i (m_{it-1}) the past level of institutional quality in the host country (denoted N_{it-1}) and the past level of human capital in country i (H_{it-1}). The variable N_{it-1} captures of the norm related to institutional quality that could be transmitted by its migrants abroad (the so called Diaspora externality in terms of norm). The past levels refer to 1990 while the change in institutional quality is between 2000 and 1990. In order to emphasize the role of education in the way migration affects institutions, each equation is estimated using total migration and skilled migration respectively.

3.2 Data

Institutional data

We use the Kaufmann et al. (1999) data. They report six indicators of governance for a large set of developed and developing countries (see Appendix A). A higher level of the indicator means better quality of institutions. The six indicators are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. The indicators are available over the 1994-2009 period. We use two data points for each indicator, i.e. the one related to 1994 and 2004. This allows us computing the change in governance quality over the 1994-2004 period that can be related to migration rates and country's norms computed in 1990.

Migration data

We use the Docquier and Marfouk (2006) (release 2.1) data set. To address the three questions presented in Section 1 (i.e. the impact of international migration on institutions, the role of the level of education of emigrants and transfer of norms), we construct four variables. The first one is the total emigration rates for each origin country defined as the total stock of migrants abroad over the total working population (total labor force). The second is similar except that it focuses on skilled migration. It is defined as the stock of

migrants with tertiary education over the skilled labor force (labor force with tertiary education). The third and four variables concern the norm. They are defined as the weighted average of the levels of governance quality across destination countries. One uses the weights based on total migration while the other uses skilled migration.

In formal terms, total migration rate for education level s is given by:

$$m_{it}^s = \frac{\sum_{j=1}^{J} M_{ijt}^s}{LF_{it}^s} \tag{2}$$

where M_{ijt}^s denotes the stock of migrants from origin country i in country j at time t with education level s and LF_{it}^s is the labor force in country i at time t with education level s.

Regarding norms, we assume that migrants adopt the level of the quality of institutions prevailing in the destination countries. The norm adopted by migrants from country i to different destination, denoted $NA_{i,t}^s$ is the weighted average of the levels of institutions quality across destination countries. It depends on the education level of migrants denoted by s. The weights are the shares of the migrant stock from country i in the corresponding destination country with education level s:

$$NA_{i,t}^s = \frac{\sum_{j=1}^{J} M_{ijt}^s I_{jt}}{\sum_{j=1}^{J} M_{ijt}^s} \tag{3}$$

As pointed out in the introduction, while emigration could affect the quality of the home country institutions, the effect might be positive or negative depending on whether the quality of institutions in the host country is better or worst than in the host country. To allow for possible negative or positive transfer of norms, we use the difference in the quality of institutions in the origin and host countries. Moreover, since the norm is transmitted to country i through migrants, we assume that the transmission depends on the intensity of emigration, i.e. depends on the emigration rate of workers with skill level s:

$$N_{i,t}^s = m_{it}^s \left(NA_{i,t}^s - I_{it}^s \right) \tag{4}$$

Note that we could consider different combinations for the norms absorbed by the migrants and the way they are transmitted. For instance, we can figure out that the political norm is absorbed by all migrants but that the norm is only transmitted by educated migrants, considering only the tertiary education level. This case corresponds

for instance to a situation where only skilled migrants have influence on their home country and can transmit the norms back at home. Alternatively, the norm can be assumed to be absorbed by skilled migrants but transmitted by all migrants. We assume in what follows that the absorption and transmission of the norms involve the same skill level.

3.3 Data Analysis

Descriptive statistics

Table 1 presents the descriptive statistics of the dependent and explanatory variables in Equation 1. Beside the difference in the number of observations available for each indicator of the quality of institutions, Table reveals 1 a potential problem with two indicators: "Political stability" and "rule of law". While the corresponding series exhibit comparable descriptive statistics to the other indicators when they refer to the origin country's institutions, they show standard deviations at least 10 times lower (as compared to the other indicators) when they refer to the destination country's institutions (i.e. the transferred norm). The way the corresponding series have been constructed and inspection of the basic data suggest that migrants are, in general, living in "politically stable" countries and countries "enforcing" the rule of the law; which could make sense. However, it results in series that are flat compared to the series of the other indicators; which induces no meaningful coefficients. Actually, the results with these two variables proved to be problematic. For these reasons, we decided not to report the results with these two indicators.

Table 1: Descriptive statistics

	Mean	Standard deviation	Minimum	Maximum	Number of observations
Voice and accountability					
ΔI_{it}	0.000	0.404	-1.285	1.570	190
I_{it-1}	-0.040	1.006	-1.983	1.712	190
N_{it-1} Total migration	0.156	0.297	0.000	2.287	190
N_{it-1} Skilled migration	0.160	0.310	0.001	2.480	190
Political stability					
ΔI_{it}	-0.429	0.957	-3.049	1.277	178
I_{it-1}	0.289	0.123	0.171	0.660	178
N_{it-1} Total migration	0.378	0.006	0.350	0.423	178
N_{it-1} Skilled migration	0.378	0.005	0.362	0.420	178
Government effectiveness					
ΔI_{it}	0.001	0.374	-1.067	1.042	178
I_{it-1}	-0.045	1.009	-1.799	2.534	178
N_{it-1} Total migration	0.190	0.472	-0.024	2.932	178
N_{it-1} Skilled migration	0.196	0.489	-0.006	3.298	178
Regulatory quality					
ΔI_{it}	-0.172	0.123	-0.479	-0.048	180
I_{it-1}	0.363	0.145	0.219	0.670	180
N_{it-1} Total migration	-0.001	0.032	-0.185	0.083	180
N_{it-1} Skilled migration	-0.001	0.032	-0.185	0.083	180
Rule of law					
ΔI_{it}	-0.386	1.089	-2.954	1.855	165
I_{it-1}	0.272	0.170	0.149	0.793	165
N_{it-1} Total migration	0.312	0.004	0.301	0.334	165
N_{it-1} Skilled migration	0.311	0.002	0.305	0.328	165
Control of corruption					
ΔI_{it}	-0.037	0.450	-1.690	0.921	149
I_{it-1}	0.010	1.084	-2.130	2.440	149
N_{it-1} Total migration	2.420	0.364	1.081	2.972	149
N_{it-1} Skilled migration	2.501	0.271	1.334	2.998	149
m_{it-1} Total migration	8.261	16.096	0.023	89.303	193
m_{it-1} Skilled migration	2.525	5.035	0.011	33.761	193
H_{it-1}	7.718	7.033	0.144	43.820	193

Migration data

Figure 1 compares the extent of the brain drain and low skilled migration across the World's region in 2000. It shows that the rates of low skilled migration are always lower than the brain drain confirming that human capital formation is positively associated with higher migration prospects. Among the six regions under consideration, Sub-Saharan Africa (SSA) and Latin America are the most affected by the brain drain. The MENA ranks third; preceding Asia and Europe. It also experiences higher brain drain than the world average.

Figure 1: Migration and brain drain around the World in 2000
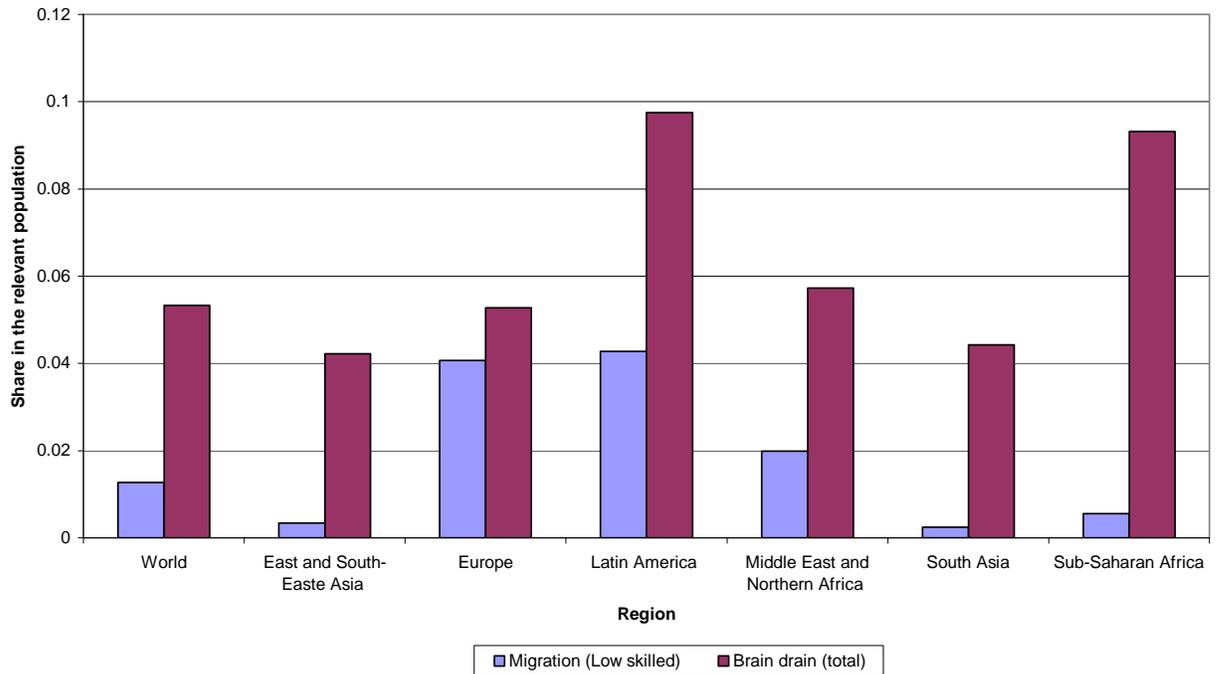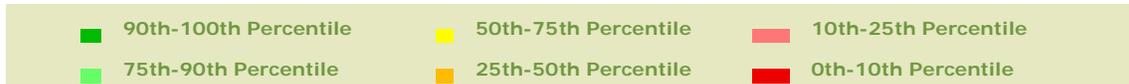

Quality of institutions

As explained in Section 3.2, we use the Kaufmann et al. (1999) data set which reports 6 indicators of governance for a large set of developed and developing countries. To save on space we focus on two of these indicators in this section. The aim is to highlight differences across countries that can be used to address our main questions. The first indicator is "voice and accountability" which measures the extent to which a country's
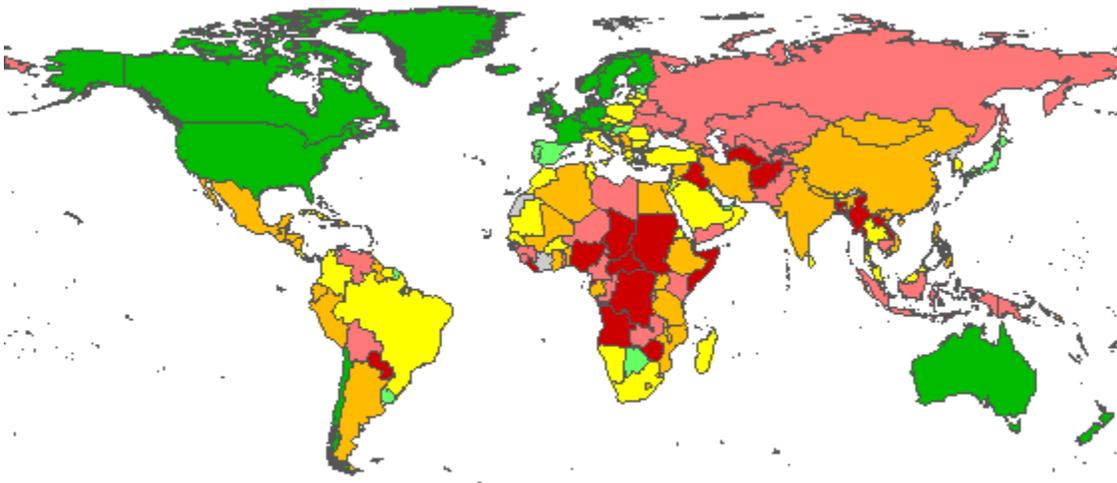
citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. The second is "control of corruption" and measures the extent to which public power is not exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Figure 3 presents World maps highlighting countries by class of quality of governance from the 0-10 percentile (worst quality) to the 90-100 percentile (best quality). Unsurprisingly, almost all developed countries (North America, Europe and Australia) belong to the highest percentile irrespective of the indicator. Much more contrasts appear regarding developing countries. The differences also depend on the indicator at hand. Regarding "voice and accountability", most of Latin American countries belong to percentiles 25-50 and 50-75. None of them belongs to the percentile 0-10. The latter includes only African and Asian countries but not all of them. When it comes to "control of corruption", the contrast between Latin America on one hand and Africa and Asia on the other hand more is less clear cut. Some Latin American countries downgrade while some African and Asian upgrade. Similar upgrading holds for the MENA but the contrasts inside the region remain.

Figure 3

Voice and Accountability (2004)

■ 90th-100th Percentile	■ 50th-75th Percentile	■ 10th-25th Percentile
■ 75th-90th Percentile	■ 25th-50th Percentile	■ 0th-10th Percentile
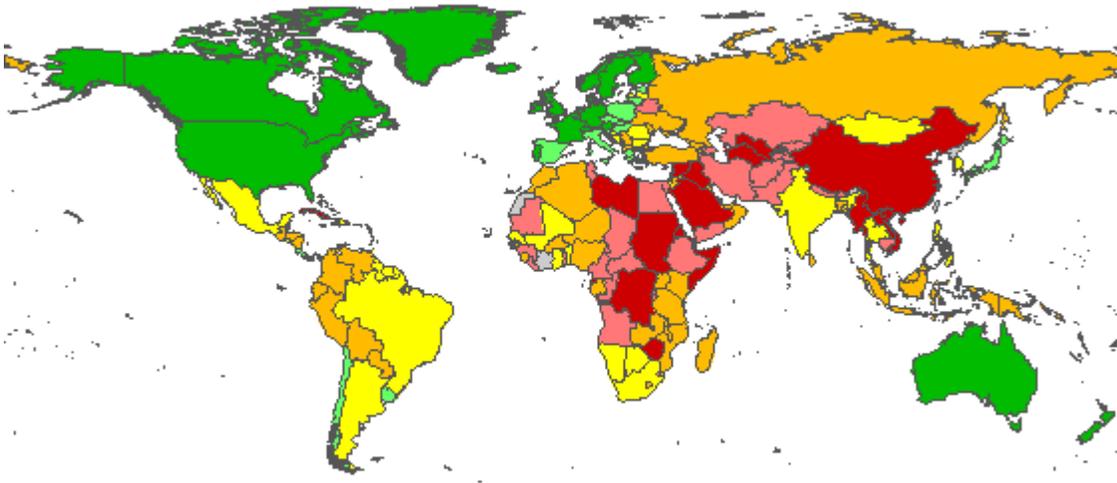
Control of Corruption (2004)

Source: World Bank

4. The results

In this section, we present different sets of estimation results. The first set is based on the application of the OLS method to Equation (1) using the whole sample of developed and developing countries. However, since some econometric issues may affect the quality of the OLS estimates, they are discussed and addressed using other estimation methods i.e. SURE and 2SLS. Finally, since for developing countries the issues of institutions and transfer of norms are more sensitive than for developed countries, we re-run our regressions on developing countries only.

4.1 OLS estimation

This section presents and interprets the results using OLS and discusses their potential robustness. Table 3 reports the estimation results of Equation (1) on each measure of the quality of institutions considered separately. It also makes a distinction between total emigration and skilled emigration. In the first set of regressions, we use the total emigration rates. In the second set of regressions, we use skilled emigration.

The overall quality of the fit is similar for total and unskilled migration but differs highly across indicators ranging from over 90% for "regulatory quality" to below 10% for "voice and accountability". The coefficient of the lagged quality of institutions is always negative and significant confirming the existence of a catch-up process in the quality of institutions. The coefficient of the lagged human capital is, in general, positive and significant, confirming the importance of education in improving the quality of institutions. Looking at our variables of interest (migration and norm), the pattern of significant coefficients is similar for skilled and total migration.

Focusing on the coefficients of emigration, they are significant in 2 cases out of 4 in each panel. The significant coefficients are higher in absolute value for skilled than for total migration; suggesting a higher impact of skilled migration. The coefficient is negative for "voice and accountability". This might be related to the exit/voice model discussed above. Skilled emigration reduces the voicing capacity at home which weakens pressures in favor institutional improvement. Potential voicing from abroad doesn't seem to

compensate for the loss in domestic capacity of voicing. For "regulatory quality", the coefficients are positive. Turning to the coefficients of norm, they are significant only in one case ("voice and accountability") when total migration is considered and in two cases when skilled migration is considered. These significant coefficients are positive lending support to the hypothesis of transfer of norm from the host to the home country.

In sum, both skilled and total migrations have an impact on the quality of home country's institutions but the impact of skilled migration is higher. The impact is positive except in one case: "voice and accountability". In this case the direct effect of migration is negative but the indirect impact through the transfer of norm is still positive.

Table 3: The impact of migration on the change in institutions (1990-2000)
OLS

	Voice and accountability	Government effectiveness	Regulatory quality	Control of corruption
		Total migration		
I_{t-1}	-0.072	-0.082	-0.875	-0.194
	(2.179)**	(2.362)***	(46.877)***	(4.728)**
m_{t-1}	-0.968	0.491	0.049	0.242
	(2.121)**	(0.525)	(4.017)***	(0.743)
N_{t-1}	0.727	0.005	0.148	-1.863
	(2.575)***	(0.016)	(1.803)*	(0.940)
H_{t-1}	0.121	0.164	0.086	1.780
	(0.301)	(0.443)	(5.702)***	(2.753)***
Constant	-0.046	-0.055	0.132	-0.199
	(0.931)	(1.147)	(21.041)***	(2.483)***
Observations	190	178	180	149
Adjusted R^2	0.07	0.07	0.99	0.13
		Skilled migration		
I_{t-1}	-0.072	-0.064	-0.836	-0.184
	(2.224)**	(2.055)**	(53.580)***	(4.595)***
m_{t-1}	-2.721	-1.138	0.175	-1.545
	(3.874)***	(1.209)	(5.247)***	(0.851)
N_{t-1}	0.601	0.273	0.012	0.260
	(3.974)***	(2.622)***	(0.224)	(1.559)*
H_{t-1}	0.106	0.134	0.093	1.759
	(0.266)	(0.363)	(6.319)***	(2.726)***
Constant	-0.039	-0.039	0.120	-0.197
	(0.800)	(0.852)	(22.180)***	(2.578)***
Observations	190	178	180	149
Adjusted R^2	0.08	0.07	0.99	0.13

Robust t-statistics in parentheses
* significant at 10%,** significant at 5% level; *** significant at 1% level

The above estimation results could, however, be impacted by two econometric issues of particular importance in our context.

First, OLS does not account for possible sources of endogeneity. One source of endogeneity is that under some conditions emigration rates are likely to depend on the change in institutions. There are basically two conditions. First, institutions in origin countries should act as push factors to emigration. For instance, low government efficiency is likely to induce skilled workers willing to set up their own business to emigrate. A second condition is that agents form expectations with respect to institutional changes. If the future change in institutional quality is relatively correct, then there is a case for reverse causality. Under those conditions, OLS estimates are likely to be biased.

It is not sure, however, that, in our framework, the endogeneity problem is serious enough for the following reasons. First, our dependent variable is the change in the quality of institutions between 1990 and 2000 while the explanatory emigration rate pertains to 1990. Such change is not observable and unknown in 1990 and it is hard to envisage how it can explain the stock of emigration of this year especially given that such stock is the result of individual decision over the pre-1990 period. Second, while expectations could play a role, the change in the quality of institutions is determined by so many factors (especially during our period of observation which witnessed such dramatic change as the collapse of the communist block) that it is hard to support that such expectations were so well formed in 1990 that the resulting emigration outcome is highly correlated with the change in the quality of institutions ten years later. Third, the alternative to OLS estimator is the 2SLS estimator. The latter is advised only if the loss of precision and the bias induced by relatively weak instruments are more than offset by the correction of the underlying OLS bias. For instance if the explanatory variable are exogenous, OLS gives more consistent results. Therefore, to be sure of the consistency of our estimates we will run exogeneity test for emigration rate and 2SLS if exogeneity is rejected.

Second, single equation estimation does not account for possible correlation in the ε_{it} across institutional quality measures. For instance, an important shock occurring in a given country (say a *coup*) is likely to affect simultaneously a large set of institutional

quality measures (say corruption, accountability and government efficiency). In order to account for such correlation, we re-estimate Equation (1) using SURE.

4.2 Exogeneity tests and 2SLS estimation

As discussed in Section 4.1 OLS estimates may be impacted by possible endogeneity of emigration rates. In this section, we address this issue by first testing the exogeneity of this variable. If it is found to be exogenous we stick to OLS results because they are consistent. If the exogeneity hypothesis is rejected, we switch to 2SLS.[5]

Exogeneity

In our context, we can apply the "weak exogeneity" test since inference on the emigration coefficient only requires that emigration is not correlated with the disturbance term (Engle et al., 1983). One simple test (see Johnston and DiNardo, 1997) follows the 2 following steps. First, we regress the emigration on a set of exogenous variables/instruments and collect the residuals. Second, we regress the change in the quality of institutions on a constant, the emigration rate and the collected residuals. If the coefficient of the computed residuals is not significantly different from zero (using the Student test, for instance), emigration rate is considered as "weakly exogenous" with respect to the change in the quality of institutions.

Tables 4 and 5 present the results of this procedure. Drawing on Docquier et al. (2007), the exogenous variables/instruments we include in the first step are: country size, dummy for low income countries, dummy for tropical countries and dummy for countries having a British legal system. For the test to be valid these variables should be sufficiently correlated with the emigration rates i.e. they should be strong in Murray (2006)'s terminology. The latter suggests using the Staiger and Stock (1997) "rule" for this purpose. Following this rule, the correlation can be considered as high enough if the first-stage F-statistic is above 10. The results in Table 4 confirm that this is the case.

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[5] Note that the use of 2SLS is equivalent here to Instrumental Variable estimation.

Table 4: Regression of total and skilled migration on instruments (1990)

	Total migration	Skilled migration
Country size	0.000	0.000
	(2.545)***	(2.662)***
Low income	-0.115	-0.036
	(4.729)***	(4.926)***
Tropical	0.070	0.024
	(2.974)***	(3.372)***
British legal system	0.054**	0.026
	(2.291)	(3.663)***
Constant	0.079***	0.020
	(4.099)	(3.451)***
Observations	161	161
F-test	10.11	13.65
Adjusted R^2	0.19	0.24

Absolute value of t-statistics in parentheses; * significant at 10% level;
** significant at 5% level; *** significant at 1% level

F test : null hypothesis all slope coefficient jointly equal to zero.

Table 5 reports the second step of the exogeneity test. To save on space, only the coefficients of the residuals and their t-statistics are presented. Both for skilled and total emigration, the tests don't reject the hypothesis of exogeneity for "voice and accountability", "regulatory quality" and "government effectiveness". For these indicators the results of OLS and SURE are validated. For the remaining indicator ("control of corruption"), the results are borderline. Exogeneity is rejected at the 10%. Hence the 2SLS method is used for the sake of robustness.

Table 5: Tests of weak exogeneity of migration rates

	Voice and accountability	Government effectiveness	Regulatory quality	Control of corruption
Total migration				
Coefficients	0.209	0.335	-0.037	-1.140
t-statistics	(0.437)	(0.778)	(0.208)	(1.729)*
Skilled migration				
Coefficients	-0.024	1.025	0.032	-3.089
t-statistics	(0.018)	(0.836)	(0.061)	(1.501)

Robust t-statistics in parentheses
* significant at 10% level; ** significant at 5% level; *** significant at 1% level

2SLS

The 2SLS estimation also proceeds in two steps. First, we regress the emigration rate on a set of exogenous variables/instruments and collect the fitted series. Second, we use the latter as explanatory variables of the change in the quality of institutions together with the other explanatory variables. Here again, the exogenous variables/instruments should be enough correlated with the emigration rates (strong). Moreover, they should be uncorrelated with the disturbances of the equation of interest (in our case, Equation 1). Since we use the same exogenous variables as in Table 4, the instruments are strong. To judge whether the chosen instruments are valid, Murray (2006) suggests using the Sargan (1958) test. The Sargan test boils down to regress the residuals from the second step estimation of the equation of interest on the instruments and uses the R^2 to test the significance of this regression. The test statistic is the number of observations times the R^2 and has a chi-square distribution. Its degree of freedom is equal to the number of instrument minus the number of variables to be instrumented.

Table 6: The impact of migration on the change in institutions (1990-2000)
2SLS: Second Step

	Control of corruption
Total migration	
I_{t-1}	-0.187
	(3.099)***
m_{t-1}	1.186
	(0.682)
N_{t-1}	0.062
	(0.107)
H_{t-1}	1.507
	(2.223)**
Constant	-0.267
	(3.098)***
Observations	134
Sargan-test	0.21
Adjusted R^2	0.12
Skilled migration	
I_{t-1}	-0.132
	(2.484)***
m_{t-1}	-3.112
	(0.658)
N_{t-1}	0.875
	(1.664)*
H_{t-1}	1.519
	(2.274)**
Constant	-0.256
	(3.127)***
Observations	134
Sargan-test	0.13
Adjusted R^2	0.38

Robust t-statistics in parentheses, * significant at 10% level; ** significant at 5% level; *** significant at 1% level, Sargan-test : p-value reported, null hypothesis = validity of exclusion restriction.

Table 6 reports the results of the 2SLS estimation. The Sargan statistics is not significant both for total and skilled migrations; meaning that instruments are not correlated with the error term. Hence, the 2SLS estimation results of the latter are reliable. For this indicator, the coefficients of human capital are positive and significant. The coefficients pertaining to the effect of migration are never significant.

4.3 SURE estimation

In this section, we look at the robustness of the OLS results regarding the impact of emigration accounting for correlations between the various dimensions of institutions. Bang and Mitra (2009) show that measures of institutions or governance are characterized by several dimensions that can be captured by unobserved factors. The SURE estimates of the system including the three indicators, for which endogeneity was not an issue, allow accounting for the existing correlation across residuals. They are more efficient than OLS. However, the total number of countries is constrained by the availability of all indicators for the whole sample, which leads to a decrease in the total number of observations.

Table 7 reports the estimation results. It is organized as Table 3. Like in the latter, the overall quality of the fit differs highly across indicators (between 90% and 10%). Almost all the effects of total migration found in Table 3 disappear in Table 7. In contrast the effects of skilled migration remain. The coefficients of the lagged quality of institutions confirm the existence of a catch-up process and the coefficients of the lagged human capital confirm the importance of education in improving the quality of institutions. The coefficient of skilled emigration is significantly negative for "voice and accountability" and significantly positive for "regulatory quality". The coefficients of norm are positive and significant for "voice and accountability" and "regulatory quality"; lending support to the hypothesis of a transfer of norm from the host to the home country. Overall the results in Table 7 confirm our main previous findings. Skilled migration has an impact on the quality of home country's institutions. Such an impact is higher than the one of total migration. The impact is positive except in one case: "voice and accountability". In this case the direct effect of migration is negative but the indirect impact through the transfer of norm is still positive.

Table 7: The impact of migration on the change in institutions (1990-2000)
SURE

	Voice and accountability	Government effectiveness	Regulatory quality
		Total migration	
I_{t-1}	-0.084	-0.055	-0.834
	(2.189)**	(1.486)	(88.297)***
m_{t-1}	-0.758	0.348	0.051
	(1.259)	(0.392)	(6.210)***
N_{t-1}	0.607	0.054	0.000
	(1.917)*	(0.178)	(0.010)
H_{t-1}	0.193	-0.043	0.098
	(0.402)	(0.091)	(5.981)***
Constant	-0.059	-0.036	0.119
	(1.105)	(0.725)	(27.945)***
Observations	178	178	178
Adjusted R^2	0.06	0.09	0.97
		Skilled migration	
I_{t-1}	-0.081	-0.041	-0.833
	(2.232)**	(1.216)	(87.685)***
m_{t-1}	-2.591	-1.371	0.168
	(2.267)**	(1.050)	(6.017)***
N_{t-1}	0.563	0.298	0.013
	(3.167)***	(2.217)**	(0.275)
H_{t-1}	0.180	-0.047	0.097
	(0.382)	(0.101)	(5.864)***
Constant	-0.052	-0.023	0.118
	(0.984)	(0.487)	(27.680)***
Observations	178	178	178
Adjusted R^2	0.08	0.09	0.97

Bootstrap t-statistics in absolute terms in parentheses
* significant at 5% level; *** significant at 1% level

4.4 Developing countries

So far, we applied different estimation methods to Equation (1) to get the most consistent results but we used the sample including both developed and developing countries. Since the issues of institutions and transfer of norms are more sensitive for developing than for developed countries, in this section we examine the relevance of our findings to developing countries. To this end, we re-run the most consistent regressions identified in

the previous sections on developing countries only. We keep, however, the distinction between total and skilled migration. Table 8 presents the results in a way similar to Table 3. When the 2SLS method is applied, we use the same instruments as before. The relevant tests show that they are still strong and valid. In term of comparison between skilled and total migration the results are broadly similar to the ones with the whole sample; especially in terms of the magnitude of the effect which is always higher with skilled migration. We focus on the skilled migration in what follows.

With "Voice and accountability", the coefficient of skilled emigration is significantly negative while the one of norms is significantly positive. Higher skilled emigration rate reduces the voicing capacity at home but allows transferring the quality of norms prevailing in the host country to the home country. In contrast, the coefficients of skilled emigration are significant and positive with "Regulatory quality" and "Control of corruption". Note that the latter was not significant with the whole sample. The corresponding coefficients of the norm are non significant.

Table 8: The impact of migration on the change in institutions (1990-2000)
Developing countries

	Voice and accountability SURE	Government effectiveness SURE	Regulatory quality SURE	Control of corruption 2SLS
Total migration				
I_{t-1}	-0.092	0.011	-0.842	-0.368
	(1.788)*	(0.191)	(88.782)***	(5.287)***
m_{t-1}	-0.876	-0.134	0.046	1.482
	(1.145)	(0.094)	(5.185)***	(2.493)***
N_{t-1}	0.644	0.181	-0.045	0.012
	(1.684)*	(0.377)	(0.883)	(0.089)
H_{t-1}	0.636	0.996	0.038	2.513
	(0.807)	(1.476)	(1.475)	(2.862)***
Constant	-0.082	-0.051	0.123	-0.492
	(1.212)	(0.827)	(27.154)***	(1.446)
Observations	138	138	138	102
Sargan-test	..	..	..	0.51
Adjusted R^2	0.05	0.05	0.99	0.28
Skilled migration				
I_{t-1}	-0.084	0.014	-0.841	-0.369
	(1.688)*	(0.260)	(88.649)***	(5.341)***
m_{t-1}	-2.670	-1.090	0.147	3.787
	(1.888)*	(0.722)	(5.132)***	(2.139)**
N_{t-1}	0.542	0.234	-0.049	0.141
	(2.654)***	(1.584)	(0.950)	(0.856)
H_{t-1}	0.614	0.997	0.039	2.887
	(0.788)	(1.481)	(1.510)	(3.171)***
Constant	-0.070	-0.048	0.122	-0.811
	(1.043)	(0.809)	(27.055)***	(1.868)*
Observations	138	138	138	102
Sargan-test	..	..	..	0.52
Adjusted R^2	0.07	0.05	0.99	0.29

Robust t-statistics in parentheses, * significant at 10% level; ** significant at 5% level; *** significant at 1% level, F-test for testing for weak instruments (>10 means strong instruments); Sargan-test: p-value reported, null hypothesis = validity of exclusion restriction.

5. Conclusion

The present paper contributes to the literature on the impact of emigration on the origin country. It focuses on the impact on institutions. Using bilateral migration data from and to both developed and developing countries and four indicators of the quality of institutions ("Voice and accountability", "Government effectiveness", "Regulatory quality" and "Control of corruption"), the econometric analysis examines the impact on the change of the quality of institutions in the origin country. The paper addresses three specific questions: i) What is the impact of international emigration on the quality of institutions in the sending country? ii) Is the level of education of emigrants important for such an impact to take place? and iii) Is a change of the quality of institution in the home country depends on their quality in the host country?

Using the whole sample of developed and developing countries both as senders and receivers, we find evidence that total migration affects directly the change in institutions. The impact is positive for all indicators except "voice and accountability". In this case the effect of emigration is negative and significant suggesting that emigration reduces the voicing capacity at home which weakens pressures in favor institutional improvement. Similar results hold for skilled migration (positive impact for all indicators but "voice and accountability") but its impact is much higher. Turning to the impact of the host country's institutions, we find evidence of positive and significant effects especially when skilled migration is considered. These results lend support to the hypothesis of transfer of norm from the host to the home country. All the above results are robust to estimation methods and sample coverage.

The issues of institutions and transfer of norms being potentially more sensitive for developing countries, we rerun our estimation on a sample with only developing countries as senders. The results are broadly similar to the ones with the whole sample. In term of comparison between skilled and total migration the effects are always higher with skilled migration. The effect of emigration on "voice and accountability" is negative while the effect of the norm is positive. The impacts of skilled emigration are positive with "Regulatory quality" and "Control of corruption" but the corresponding impacts of norms are non significant.

Overall, the responses to the three questions above are as follow. International emigration has an impact on the quality of institutions in the sending country but such an impact may be positive or negative. The level of education of emigrants is important because the impacts are higher with skilled than with total migration. Finally, the change of the quality of institution in the home country depends on their quality in the host country i.e. having its emigrants located in countries with better quality of institutions benefits the origin country.

Appendix A: Definition governance variables

Variable	Definition
Voice and accountability	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 a free media.
Political stability	The likelihood that the government will **not** be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism.
Government effectiveness	The quality of the 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.
Regulatory quality	The ability of the government to formulate and implement sound policies and regulations that permits and promotes private sector development.
Rule of law	The extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the absence of crime and violence.
Control of corruption	The extent to which public power is **not** exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

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